Personal and Business Level Taxes in a Small Open Economy

Suppose each country i taxes individuals on their capital income on a residence basis at rate m_i. Business level tax is levied on an origin basis in each country i at rate t_i. Given that individual taxes are levied on a residence basis and business level taxes are levied on an origin basis, then it seems reasonable to suppose that the equilibrium 'world' rate of return, common to all countries, r, is defined post-business level tax and pre-income tax.

To be able to pay the world rate of return after tax, businesses in country i require a minimum pre-tax rate of return of p_i, where

$$r = (1 - t_i)p_i$$

Individual savers in country i can expect to earn the world rate of return before personal tax; after tax they can therefore expect to earn s_i, where

$$s_i = (1 - m_i)r$$

The key insight into our perspective on these two levels of taxation is that the world rate of return, r, is determined by a very large number of non-resident investors in the rest of the world. From country i's perspective, r is fixed for a given level of risk of an investment. It follows immediately that any increase in the business level tax, t_i, will raise the required pre-tax rate of return, p_i. And any increase in the personal level tax, m_i, will reduce the required post-tax rate of return, s_i.

Individual investors can be expected to allocate their funds among different assets up to the point that the post-tax rate of return on each asset is just high enough to reflect the contribution of that asset to the overall risk of the portfolio. Differences in m_i between alternative investments will then distort the portfolio choices of individual investors. For example, suppose that for some investors the return to asset A is taxed at a higher rate than the return to asset B. Then, other things being equal, the investor has an incentive to switch her investment from A to B to benefit from the lower tax rate. Assuming that the investor starts with a well-diversified portfolio, doing so will distort the portfolio choice of the investor. If B is risky, for example, then investing more in B is likely to raise the overall risk of that investor's portfolio. As more and more of her savings are invested in B, her overall risk continues to increase, up to a point at which the marginal benefit of the tax advantage is matched by the marginal cost of the higher risk.[1]

An example of such a distortion is the case where country i offers a tax credit—a form of integration—on income received only from domestic companies. This will create a

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[1] Evidence in support of this view is provided in Bond et al (2007), who analyse a rise in the tax rate faced by UK pension funds on investing in UK companies in 1997.

distortion to portfolio choices since it favours investment in domestic businesses over other forms of investment. However, that will not affect the required rate of return for businesses in country i or elsewhere. The main impact of the tax credit is therefore to create a deadweight cost through inducing greater risk.

A business that is taxed on a pass-through—and residence—basis does not face an origin-based business level tax. To avoid distorting the choice of an individual between investing in a pass-through business, compared to a domestic business that does face a business level tax, and non-resident businesses, the individual should face the same effective tax rate, m_p, on all of these investments. This ensures that portfolio choices are not distorted by personal taxes, since the pass-through business must then also earn a return of r before personal, residence-based tax. So not only is there no need for any integration between business level and personal tax taxes on profit; doing so is likely to create a distortion that could be avoided.

This conclusion holds whatever the effective tax rate levied at the business level. However, the business level tax can, of course, affect investment since it raises the required pre-tax rate of return on investment. A tax on economic rent, however, does not fall on the normal return to capital and so does not affect the required rate of return—for such a tax, $t_i = 0$. In this case, the required rate of return before tax would be the same for domestic pass-through businesses and businesses that do face a business level tax (on economic rent). This should normally avoid distortions to the choice between these two forms of business.[2]

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[2]   A caveat to this claim is that a tax on economic rent would imply that the effective average tax rate is higher in the business that faces a business level tax. This can affect mutually exclusive choices between the two forms of investment.

The Algebra of the RPAI

This Appendix formalizes (with some simplifications) the account of the RPAI proposal set out in the text.[1]

Denote the costs incurred by the multinational in jurisdiction i by c_i. Assuming for simplicity that a single mark-up μ applies to all costs, routine profit in jurisdiction i is thus

$$\Pi^r = \mu c_i \tag{A.1}$$

and (ignoring taxes) total residual profit is then

$$\Pi^R = \sum_i (s_i - (1+\mu)c_i) \tag{A.2}$$

where s_i denotes third party sales in i.

A top-down allocation mechanism allocates this residual profit across jurisdictions as

$$\Pi_i^R = \lambda_i \Pi^R \tag{A.3}$$

for some set of weights λ_i such that $\sum_i \lambda_i = 1$.

For the purpose of a bottom-up allocation, costs c_i are divided into two types: (i) costs that can be allocated to sales in particular jurisdictions (in the numerical example, these are costs of goods sold and local sales and marketing), with a_{ij} denoting costs incurred in i that are allocable to sales in j; (ii) below the line costs that cannot be allocated to sales in any particular jurisdiction (costs of regional/global marketing, G&A, and R&D), denoted by z_i. Thus:

$$c_i = \sum_j a_{ij} + z_i \tag{A.4}$$

Residual gross income (RGI) in jurisdiction i is then

$$g_i = s_i - (1+\mu)\sum_j a_{ji} \tag{A.5}$$

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[1] This analysis can be thought of as applying to the aggregate of the multinational's activities or to a particular product or product line.

The top-down approach based on RGI simply sets $\lambda_i = g_i/G$ in equation (A.3), where $G = \sum_i g_i$ denotes aggregate RGI. Noting that

$$\Pi^R = \sum_i \left(s_i - (1+\mu)\left(\sum_j a_{ij} + z_i \right) \right) \tag{A.6}$$

$$= G - (1+\mu)Z \tag{A.7}$$

use being made of $\sum_i \sum_j a_{ij} = \sum_i \sum_j a_{ji}$ and denoting $Z = \sum_i z_i$, the residual profit allocated to i is in this case

$$\Pi_i^R = g_i - \left(\frac{g_i}{G} \right)(1+\mu)Z. \tag{A.8}$$

The bottom-up approach instead simply apportions the non-allocable costs $(1+\mu)Z$ by RGI, that is by the proportion g_i/G, and deducts the apportioned amount from RGI. That is clearly reflected in (A.8), so that the two approaches are equivalent as claimed.

Alternatively, the residual profit can be calculated in a way that more closely resembles the existing regime, as:

$$\Pi_i^R = \underbrace{s_i - (1+\mu)c_i}_{(a)} - \underbrace{\left\{ (1+\mu)\left(\sum_j a_{ji} - \sum_j a_{ij} \right) \right\}}_{(b)} - \underbrace{(1+\mu)\left\{ \left(\frac{g_i}{G} \right) Z - z_i \right\}}_{(c)} \tag{A.9}$$

where the three terms correspond respectively to: (a) sales in i less all costs (inclusive of associated routine profit) incurred in i (as in Table 6.3); less (b) the net value of purchases from, less sales to, other entities in the group, measured as the costs of goods sold including the associated routine profit (as in Table 6.4); less (c) the amount by which i's RGI-weighted share of unallocable costs exceeds unallocable costs incurred in i (as in Table 6.6).

Using (A.4) to cancel terms in (A.9) shows that the bottom-up allocation in the latter is exactly the same as the top-down allocation in (A.8).