

# **Tax Competition under Separate Accounting and Formula Apportionment**

## **Separate Accounting**

- Each country's corporate tax base is the taxable profits earned within the country: revenue minus deductible costs for tax purposes.
- These taxable profits need not be economic profits if not all costs are tax deductible.

- **Example**

- Firm uses labor and capital to produce output, as described by the production function,  $F(K_i, L_i)$  for country  $i$ .
- Only labor is tax deductible (because investment is financed by issuing equity, rather than tax-deductible bonds)
- Taxable income:  $\pi_i = F(K_i, L_i) - w_i L_i$ .
- Tax =  $t_i[F(K_i, L_i) - w_i L_i]$
- If there are constant returns to scale, after-tax profits equal zero:

$$(1-t_i)[F(K_i, L_i) - w_i L_i] - rK_i = 0;$$

- Tax =  $\frac{t_i}{1 - t_i} rK_i$

- Investment rule:  $\frac{\partial F}{\partial K_i} = \frac{r}{1 - t_i} > r$

– Conclusion: The corporate tax is a source-based tax on capital and therefore leads to inefficient tax competition: governments attempt to attract capital by lowering the tax.

- **Basic Problem with Separate Accounting:** Countries possess incentives to shift taxable income out of high-tax countries and into low-tax countries.
  - Shift taxable profits without shifting economic profits: no change in the location of physical investments, but total tax payments fall.

- Method #1: Choice of where to issue debt.
  - Reduce taxable income in a high-tax country by borrowing there and receiving a tax deduction for interest expenses (the debt can be used to finance investment elsewhere).

- Method #2: Transfer prices.
  - If a corporation transfers an intermediate good from a plant in country 1 to a plant in country 2, then there is no explicit sales price to use to measure taxable profits in these two countries.
  - A “transfer price”  $P$  should be used to measure taxable “revenue” in country 1 and tax-deductible “costs” in country 2 from the transfer of the  $S$  units of intermediate good
    - $\pi_1 = F(K_1, L_1) - w_1L_1 + PS$
    - $\pi_2 = F(K_2, L_2) - w_2L_2 - PS$
  - But if  $t_2 > t_1$ , a unit rise in  $P$  changes total taxable profits by  $(t_1 - t_2)S < 0$ .
  - Rules for transfer pricing are complex (use “market prices”, but what happens if none exist? R&D?), and create incentives to manipulate transfer prices despite possible tax penalties.

## Implications for Tax Competition

- In addition to competing for physical capital, countries compete for taxable income:
  - Starting from  $t_1 = t_2$ , raising  $t_2$  gives the firm the incentive to raise  $P$ , shifting taxable profits from country 2 to country 1 (in addition to the usual incentives for firms to shift investment from 2 to 1).
- Competition to shift taxable profits worsens the tax competition problem.
- Tax havens: Some countries “specialize” in setting low tax rates to allow countries to shift income.
  - Slemrod-Wilson (2008): tax havens worsen tax competition.

# Formula Apportionment

- Each country taxes a fraction of the firm's total taxable profits, summed over all countries.
  - Which countries? For the EU, proposals to tax only EU members –taxation stops at the “water's edge.”
- If  $P$  is total taxable profits, then taxable profits in country  $i$  are

$$p_i = \left( \alpha_K \frac{K_i}{K} + \alpha_W \frac{W_i}{W} + \alpha_S \frac{S_i}{S} \right) P$$

where subscript  $i$  denotes country  $i$ ;

$K$  = total capital;  $W$  = total payroll;  $S$  = total sales;  
 $P$  = total profits;

$\alpha_j$  = weight placed on factor  $j$  in the apportionment formula.

- **Crucial advantage of formula apportionment:** no need to calculate transfer prices, and no incentives to shift taxable income, independently of the locations of factors K, L, and S.
  - A change in the transfer price will affect the location of taxable profits, but not total profits or how they are allocated across jurisdictions.

- **Disadvantages of Formula Apportionment**

(see Gordon-Wilson, 1986)

- If payroll is in the formula, then formula apportionment distorts labor demand decisions: If  $t_2 > t_1$ , then raising  $L_2$  increases the average tax on profits, thereby increasing the marginal cost of labor.
- Similarly, including sales and capital in the formula makes it act like a tax or subsidy on these factors, depending on whether  $t_2$  is greater or less than  $t_1$ .
- To avoid the additional distortions to sales and payroll that are not present under separate counting, the formula could be defined using only capital, but then distortion to capital is present.

- **Important Proposition:** In the absence of transfer-price manipulation (and other methods of shifting taxable income independently of physical investments), *the tax competition problem is worse under formula apportionment based on capital than under separate accounting.*

- **Basic Argument** (from Sorensen, see also Gordon and Wilson, *Econometrica*, 1986)
  - Assuming constant returns to scale, total after-tax profits must equal zero.
  - If one country raises its tax rate, then total before-tax profits must rise to compensate for the higher tax burden.
  - As a result, the shared tax base under formula apportionment rises.
  - Other countries benefit from higher tax revenue, independently of the international allocation of capital – an additional positive externality!
  - Under SA, only the country's local tax base would rise, increasing revenue by more.
  - Conclusion: It is more costly to raise revenue under FA, worsening tax competition.

## **Overall Conclusion**

- Formula apportionment may reduce the problems associated with tax competition, if firms possess many opportunities to shift income across countries independently of the location of physical capital.
- But the fact that the tax base is shared under FA implies an additional externality that may worsen the tax competition problem.