CESifo *Working Paper Series*

THE OPTIMAL TAXATION OF DIVIDENDS IN A SMALL OPEN ECONOMY

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Working Paper No. 348

October 2000

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* The authors would like to thank Wolfram Richter for helpful comments and suggestions. The usual disclaimer applies.

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Abstract

This paper analyses the optimal taxation of dividends and other types of income from portfolio investment. We show that, in an open economy, it is not desirable to offer double taxation relief for dividends paid by domestic firms to domestic households. This result holds for fairly general utility functions. The reason is that the marginal shareholder in domestic firms is a foreign investor. This implies that the level of real investment is not affected by the taxation of domestic dividend income at the household level. A reduction of the tax burden on dividends is therefore merely an undesirable subsidy on domestic asset holdings. Our results also extend the literature on the optimal taxation of risky asset income in general.

Keywords: Dividends, international taxation, portfolio investment

JEL Classification: H21, H87, G11

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1. Introduction

One of the key issues in the debate about corporate income taxation is whether some kind of double taxation relief should be granted for distributed profits. According to the so-called classical system, dividends are taxed both at the firm level and at the shareholder level. This double taxation of corporate income has been criticized for distorting the allocation of resources between the incorporated and the non-incorporated sector (see, e.g. King, 1977). Many countries have therefore adopted tax integration schemes which typically imply that shareholders receive a partial or full tax credit for corporate taxes on distributed profits paid at the firm level. Some countries, though, in particular the U.S., do not have tax integration schemes.

One of the difficulties in the design of corporate-personal tax integration schemes is the treatment of international investment. In most cases, double taxation relief is only available for domestic shareholders of domestic firms. This implies that foreign investment of domestic citizens is discriminated relative to domestic investment because domestic taxpayers receive no credit for corporate taxes paid abroad. Moreover, foreign shareholders of domestic firms are discriminated relative to domestic shareholders because the latter receive a tax credit for corporate taxes while the former do not.[1]

This paper analyses the question of whether or not a small open economy benefits from having tax systems with double taxation relief, given that these systems discriminate against international equity investment in the way described above. We develop a model where domestic firms finance their investment by selling shares in the international capital market. Domestic households may hold a portfolio of bonds, domestic shares and foreign shares. The return on investment in domstic and foreign shares is assumed to be risky. We show that, in an open economy, it is not desirable to offer double taxation relief for dividends paid by domestic firms to domestic households. This result holds for fairly general preference structures. The main reason is that, in an open economy, the level of domestic investment is not affected by the taxation of dividends at the household level. A reduction

[1] See Commission of the EC (1992) or Devereux (1996).

of the tax burden on dividends is therefore only a subsidy on domestic asset holdings, which is inefficient for the economy as a whole.

In the literature, the issue of providing double taxation relief in open economies with border crossing equity investment has received little attention. A notable exception is Boadway and Bruce (1992).[2] Their analytical framework differs from ours in various respects. In particular, their model abstracts from uncertainty. Their analysis leads to the following results. In an open economy, the level of (real) investment is determined by the corporate income tax and independent of whether or not domestic shareholders are granted dividend tax credits. Dividend tax credits only affect the level of domestic savings. Dividend tax credits therefore cannot remove the distortion of investment induced by the corporate income tax. The authors conclude that, in an open economy, the distortions due to the coporate income tax can only be removed by directly imputing corporate income to shareholders or by converting the corporate income tax into a residence based tax.

Our analysis confirms the irrelevance of double taxation relief for domestic real investment. However, while the analysis in Boadway and Bruce (1992) concentrates on ways in which the allocation implied by perfect personal-corporate tax integration can be implemented in an open economy, our analysis shows that it would not be desirable to do so. We show that it may even be desirable to tax dividends paid out of after tax corporate profits at higher tax rates than other types of asset income. As we explain in further detail below, the analysis in this paper also extends the literature on the optimal taxation of general asset income under uncertainty (Richter, 1992, Christiansen, 1995).

The subsequent analysis is set up as follows. In section 2, we present the basic structure of the model. Section 3 considers the case of certainty as a benchmark. In section 4, we analyse investment decisions under uncertainty. Section 5 discusses the optimal tax policy in our model. Section 6 concludes.

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[2] Problems of corporate tax integration schemes in an international context are also discussed in Devereux and Freeman (1995). These authors analyse the impact of tax integration schemes on the investment pattern of multinational firms.

2. The model

2.1. The private sector

We consider a small open economy inhabited by a large number of identical households who live for two periods. For notational convenience, the number of households is normalised to unity. We assume that the representative household is the initial owner of a (representative) firm. In the first period, the household chooses the capital stock (K) of the firm and sells part of the firm`s equity to outside investors. In the second period, the representative domestic firm produces an output $K + F(K)(1+\theta)$, where F(K) is a strictly concave production function and $\theta$ is a random variable with an expected value of zero. The firm`s profits are

$$\Pi = K + F(K)(1+\theta)(1-\tau) \quad (1)$$

where τ is the corporate income tax rate. Note that K is a repayment of the initial capital stock of the firm which is not part of the corporate income tax base. Equation (1) allows to define the rate of return received by outside investors for investment in shares of the domestic firm. We denote this rate of return by (r_D). Given the market value of the firm (V), r_D is given by:

$$(1+r_D)V = K + F(K)(1+\theta)(1-\tau). \quad (2)$$

which can be rearranged to

$$r_D = \frac{K + F(K)(1+\theta)(1-\tau)}{V} - 1. \quad (3)$$

The household may use the return from selling part of the firm`s equity in period 1 either for consumption in period 1 (C_1) or investment in other assets. We assume that, next to shares in the domestic representative firm, there are two other assets. Firstly, the household may buy bonds with a riskless rate of return r_B. Secondly, the household may hold shares in foreign companies, where the (stochastic) rate of return is denoted by r_A. The first-period budget constraint is thus

$$C_1 = V(1-s) - K - B - A \tag{4}$$

where V is the market value of the firm, s is the share of the firm held by the household, B is investment in the risk free security and A is investment in foreign shares. In order to simplify notation, define the household`s investment in domestics stocks (D) as $D \equiv sV$ and savings (S) as $S \equiv D + B + A$. Equation (1) then becomes

$$C_1 = V - K - S \tag{4a}$$

and the second period budget constraint can be written as

$$C_2 = \left(1 + r_B(1-t_B)\right)S + \left(r_D(1-t_D) - r_B(1-t_B)\right)D + \left(r_A(1-t_A) - r_B(1-t_B)\right)A\ , \tag{5}$$

where C_2 is second period consumption, r_D and r_A denote the rates of return on investment in domestic and foreign shares and t_i (i=B,D,A) is the tax rate on the different types of income. The utility of the representative household is

$$W = U(C_1, C_2) + H(G)\,. \tag{6}$$

U(.) denotes utility form private consumption and is assumed to have the usual properties. H(G) is a concave function and denotes utility from the consumption of a local public good (G), which is provided in the second period.

2.2. The public sector

The government raises taxes in order to finance the provision of the public good G. There are four tax instruments. First, there is the corporate income tax τ raised at the corporate level. Secondly, there are the three taxes on capital income raised at the level of the households. These are

i) the tax on income from the risk free investment, t_B,

ii) the tax on income from investment in domestic shares, t_D and

iii) the tax on income from investment in foreign shares, t_A.

The government budget constraint can be written as

$$G = \tau F(K)(1+\theta) + r_B t_B S + \left(r_D t_D - r_B t_B\right)D + \left(r_A t_A - r_B t_B\right)A + R^G , \qquad (7)$$

where R^G is a random return from a portfolio of assets held by the government. The nature of this asset income will be discussed in more detail below.

2.3. Dividend taxation and double taxation relief

Since it is the objective of this paper to analyse the efficiency of granting double taxation relief for dividends, it is helpful to briefly consider the way in which double taxation relief enters the model. Empirically, schemes aiming at reducing the double taxation of corporate profits take many different forms. What they have in common is that they reduce the effective income tax burden on dividends which are paid out of profits after corporate taxation. In our model, this can be captured by simply considering a tax system with $t_D<t_B$. A classical tax system without double taxation relief, in turn, would imply $t_D=t_B$.

3. Equilibrium in a small open economy

In this section, we determine the equilibrium in our model. Consider first the savings and portfolio decisions of the household. Formally, for given values of V and K, the household`s problem is to maximize expected private utility $E\{U(C_1, C_2)\}$ over S, D and A, subject to the budget constraints (5) and (4a). The first-order conditions are

$$E\{U_1\} = E\{U_2\}\left(1 + r_B(1 - t_B)\right) , \qquad (8)$$

$$E\{U_2\left(r_D(1 - t_D) - r_B(1 - t_B)\right)\} = 0 \qquad (9)$$

and

$$E\left\{U_2\left(r_A(1-t_A)-r_B(1-t_B)\right)\right\}=0\,. \qquad (10)$$

Equations (8)-(10) determine the level of savings (S) and the household`s portfolio structure, i.e. the demand functions for D and A.

The next step is to analyse the investment decisions of firms. Since firms pursue the interests of the initial owners, i.e. the representative household in the country under consideration, investement decisions must maximize the household`s expected utility. As we demonstrate in the appendix, the maximization of the firm`s market value V is equivalent to the maximization of the household`s expected utility. Note that, in a model with incomplete capital markets like ours the equivalence of market value maximization and utility maximization is not trivial (see, e.g., Stiglitz, 1982).

The market value of the firm (V) is determined in the world capital market. Since the profit of the firm is risky, a (representative) international investor will only hold domestic shares if the return equals the safe interest rate r plus a risk premium which we denote by λ.[3] We will asssume throughout that the domestic country takes the international risk premium λ as given. By this assumption, we rule out the type of strategic behaviour analysed in Gordon and Varian (1989), where even small countries may influence security prices in the international capital market because they are suppliers of assets with unique risk characteristics.

The market value of the firm is thus given by

$$(1+r+\lambda)V=K+F(K)(1+\bar{\theta})(1-\tau) \qquad (11)$$

where $\bar{\theta}$ is the expected value of θ. From (3) and (11), one can also immediately infer that $r+\lambda=E\{r_D\}$. From the domestic household`s point of view, the optimal investment decision is now derived by the maximization of V-K over K which yields

$$(1-\tau)(1+\bar{\theta})F'(K)=r+\lambda\,. \qquad (12)$$

[3] It is crucial for our analysis that international investors hold domestic shares in equilibrium. This is always the case since the first period endowment of domestic households only consists of the shares of the domestic firm.

Consider next the government sector. Since there is aggregate uncertainty, government tax revenue is also risky. This raises the question of how budget balancing is guaranteed and whether state contingent tax rates are allowed for. In our model, we exclude state contingent taxes and we assume that the government has to set its tax rates in period 1. Since tax revenue is (in general) stochastic, public consumption becomes risky, like private consumption. It is often assumed that the representative agent is risk neutral with respect to public consumption (Richter, 1992). One problem with this approach is that it is then always welfare enhancing to shift private risks into the public sector. We think it is plausible that, at least in a small open economy, the ability of the public sector to absorb this risk is limited. We will therefore assume that the representative household is risk averse with respect to both private and public consumption.

If the public sector is risk averse, the risk management of the government becomes an important issue. For a given stream of risky tax revenue, the government can diversify these risks by buying and selling assets in the international capital market. To model these risk management decisions, we assume that, in period 1, the government buys a portfolio of the three assets. If the initial wealth of the public sector is zero, this portfolio must satisfy

$$D^G + A^G + B^G = 0 \tag{13}$$

where the superscript G indicates that the asset is owned by the government. The (stochastic) return R^G on this portfolio is given by

$$R^G = (1+r_D)D^G + (1+r_A)A^G + (1+r_B)B^G \tag{14}$$

Using (13) and (14), the government budget constraint in (7) can thus be written as

$$G = \tau F(K)(1+\theta) + r_B t_B S + \left(r_D t_D - r_B t_B\right)D + \left(r_A t_A - r_B t_B\right)A + \left(r_D - r_B\right)D^G + \left(r_A - r_B\right)A^G \tag{15}$$

The optimal government portfolio can now be derived by maximizing expected utility from public consumption, $E\{H(G)\}$, over D^G and A^G. This yields the first-order-conditions

$$E\{H`(r_B - r_D)\} = 0 \qquad (16)$$

and

$$E\{H`(r_B - r_A)\} = 0. \qquad (17)$$

5. The optimal tax policy

We can now discuss the optimal tax policy in our model. Our main interest is to determine the optimal tax treatment of dividends paid by domestic firms to domestic residents. The optimal tax policy is derived by maximizing $E\{U(C_1, C_2) + H(G)\}$ over τ and t_i (i=B, D, A). Suppose that the government first adopts a classical tax system and raises the optimal uniform tax t on all types of asset income, for a given corporate tax rate τ. Using (16) and (17), it is straightforward to show that the optimal uniform tax rate t is defined by the first-order condition

$$-E\{U_2 S r_B\} + E\left\{H`\left(S + \frac{\partial S}{\partial t} t\right) r_B\right\} = 0 \qquad (18)$$

which can be rearranged to

$$E\{U_2\} = E\left\{H`\left(1 + t\frac{\partial S}{\partial t}\frac{t}{S}\right)\right\}.$$

(19)

We can now analyse the personal-corporate tax integration issue as follows. Starting from an equilibrium with a uniform tax on all types of asset income, i.e. a classical tax system, one can determine whether a marginal reduction in the tax on dividends from domestic firms, i.e. the introduction of double taxation relief, raises welfare. Using (16) and (17), the welfare effect of a change in t_D, holding constant t_B and t_A, can be written as

$$\frac{\partial W}{\partial t_D} = -E\left\{U_2 D r_D\right\} + E\left\{H'\left(r_D D + r_B t \frac{\partial S}{\partial t_D}\right)\right\}. \qquad (20)$$

In general, the sign of the welfare effect in (20) is ambiguous. This is not surprising, given the very general formulation of the utility function in our model. However, we are able to derive unambiguous results for two particularly important classes of utility functions, namely i) utility functions with constant relative risk aversion and ii) utility functions with constant absolute risk aversion. More formally, these two types of preferences can be characterized as follows:[4]

Assumption 1: The utility function has the following properties:

i) $U_{12} = 0$ (21)

ii) $-U_i / U_{ii} = a_0 + a_1 C_i$, i=1,2 (22)

where a_0 and a_1 are constant and nonnegative parameters and U_{ii} is the second derivative of the utility finction with respect to C_i. Assumption 1 implies constant relative risk aversion if $a_0=0$, $a_1>0$ and constant absolute risk aversion if $a_0>0$, $a_1=0$. We may now state

Proposition 1: If the utility function exhibits constant relative risk aversion ($a_0=0$, $a_1>0$), a uniform income tax on all types of asset income (no double taxation relief) is optimal.

Proof: The result in proposition 1 states that the welfare effect in (20) is zero. Evaluated at $t_B=t_D=t$, equations (9) and (16) imply $E\left\{U_2 r_D\right\} = E\left\{U_2 r_B\right\}$ and $E\left\{H' r_D\right\} = E\left\{H' r_B\right\}$. Equation (20) can then be written as

$$\frac{\partial W}{\partial t_D} = \left(-E\left\{U_2\right\} + E\left\{H'\left(1 + \frac{\partial S}{\partial t_D}\frac{t}{D}\right)\right\}\right) r_B D \qquad (23)$$

[4] Utility functions satisfying assumption 1 describe the class of HARA-utility functions.

Comparing (19) and (23) shows that the right-hand-side of (23) is zero if $\frac{\partial S}{\partial t_D}\frac{t}{D}=\frac{\partial S}{\partial t}\frac{t}{S}$. That this is indeed the case can be shown as follows. Multiplying the first-order conditions in (8)-(10) with S, D and A and adding up yields

$$U_1 S = E\{U_2 C_2\}. \tag{24}$$

Differentiating (24) leads to

$$\left(U_1 - U_{11}S\right)dS = E\left\{\left(U_2 + U_{22}C_2\right)dC_2\right\}. \tag{25}$$

Using the property $U_{ii} = -U_i / a_1 C_i$, i=1,2 leads to

$$U_1\left(1+\frac{S}{a_1C_1}\right)dS = E\{U_2 dC_2\}\left(1-\frac{1}{a_1}\right). \tag{26}$$

The change in C_2 is

$$\begin{aligned} dC_2 &= (1+r_B(1-t))dS - r_B S dt + (r_D - r_B)\left((1-t)dD - Ddt\right) \\ &\quad + (r_A - r_B)\left((1-t)dA - Adt\right). \end{aligned}$$

(27)

Substituting (27) into (26) and using the first-order-conditions (8)-(10) yields

$$U_1\left(\frac{S}{a_1C_1}\right)dS = E\left\{U_2\left(r_B S dt\left(\frac{1}{a_1}-1\right)-\left(1+r_B(1-t)\right)\frac{dS}{a_1}\right)\right\}.$$

(28)

This can be rearranged to

$$\frac{U_1}{a_1}\left(\frac{S}{C_1}+1\right)\frac{dS}{dt}\frac{1}{S} = E\left\{U_2 r_B\left(\frac{1}{a_1}-1\right)\right\}. \tag{29}$$

The next step is to differentiate (24) for $dt_B = dt_A = 0$ and $dt_D \neq 0$. The change in second period consumption is now

$$dC_2 = (1 + r_B(1-t))dS - r_D D dt_D + (r_D - r_B)(1-t)dD + (r_A - r_B)(1-t)dA \,. \tag{30}$$

Substituting (30) into (26) and using the first-order conditions in (8)-(10) yields

$$\frac{U_1}{a_1}\left(\frac{S}{C_1}+1\right)\frac{dS}{dt_D}\frac{1}{D} = E\left\{U_2 r_B\left(\frac{1}{a_1}-1\right)\right\}. \tag{31}$$

Comparing (31) and (29) shows that $\frac{\partial S}{\partial t_D}\frac{t}{D} = \frac{\partial S}{\partial t}\frac{t}{S}$ holds, which implies that the right-hand side of (23) vanishes.Q.E.D.

The result in proposition 1 shows that, for an important class of utility functions, it is optimal to raise a uniform tax on all types of asset income. This implies that granting double taxation relief for domestic dividend income is not desirable. It is interesting to compare the result in proposition 1 to the key finding in Christiansen (1995). In his model, it also turns out that, for preferences with constant relative risk aversion, the optimal tax policy implies no portfolio distortion, i.e. a uniform tax on all types of asset income (see his proposition 2, p. 297). The difference is that he considers a world where the government may set state-contingent taxes, which is ruled out in our model.

Consider next the case of constant absolute risk aversion. Here, we can state

Proposition 2: If the utility function exhibits constant relative risk aversion ($a_0>0$, $a_1=0$), it is optimal to set $t_D>t_B$.

Proof: The welfare effect of an increase in t_D in (20) can be written as

$$\frac{\partial W}{\partial t_D} = \left(E\{H'\} - E\{U_2\} + E\left\{H`\frac{\partial S}{\partial t_D}\frac{t}{D}\right\}\right) r_B D \,. \tag{32}$$

Note first that $E\{H'\} \geq E\{U_2\}$ will always hold because, if this condition was violated, the government could simply pay a lump sum transfer to the household in the second period. A sufficient condition for $\frac{\partial W}{\partial t_D} > 0$ would therefore be $\frac{\partial S}{\partial t_D} > 0$. Differentiating the first-order condition in (8) and using $U_{ii} = -U_i / a_0$ (constant absolute risk aversion) leads to

$$\frac{U_1}{a_0} dS = E\left\{-\frac{U_2}{a_0} dC_2\right\}(1 + r_B(1 - t_B)). \qquad (33)$$

The change in C_2 is given by (30). Substituting into (33) and using (8)-(10) yields

$$\left[\frac{U_1}{a_0} + E\left\{\frac{U_2}{a_0}\left(1 + r_B(1 - t_B)\right)^2\right\}\right] dS = E\left\{\frac{U_2}{a_0} r_D\right\} dt_D \qquad (34)$$

which implies $dS/dt_D > 0$ and thus $\frac{\partial W}{\partial t_D} > 0$ .Q.E.D.

The result in proposition 2 implies that the tax on domestic dividends should even be higher than the tax on non-risky asset income. Departing from a uniform tax, a marginal introduction of double taxation relief would thus reduce welfare. The intuition for this result is that, as we show in the proof of proposition 2 in the appendix, raising t_D above t_B triggers an increase in savings. The initial savings distortion induced by the uniform tax t is thus mitigated by raising t_D above t_B.

6. Conclusions

In this paper, we have studied the optimal taxation of dividends and other types of income from portfolio investment in an open economy framework. The analysis has shown that, in an open economy, where the marginal shareholder is a foreigner, it is not desirable to offer double taxation relief for dividends paid by domestic firms to domestic households. This result holds for fairly general utility functions. The reason is that, in an open economy, the level of real investment is not affected by the taxation of domestic dividend income at the household level. A reduction of the tax burden on dividends relative to the tax burden on other assets is therefore only a subsidy on domestic asset holdings. For the standard classes of utility functions considered above, such a subsidy is inefficient.

Of course, next to the application to the issue of double taxation relief, our analysis extends the literature on the optimal taxation of risky asset income in general. We have shown that a uniform tax on all types of asset income is optimal for the case of constant relative risk aversion. For constant absolute risk aversion, it is optimal to raise even higher taxes on risky assets, the reason being that an increase in the tax on risky assets encourages savings and thus mitigates the overall savings distortion.

Appendix

In this appendix, we show that, despite the presence of uncertainty and incomplete capital markets, it is indeed optimal for the household to maximize the value of the firm. The basic idea of the proof is taken from Gordon (1985). Substituting the budget constraints of the private household into the utility function yields

$$\begin{aligned} E\{U(C_1, C_2)\} = E\{U(V - K - S, (1 + r_B(1 - t_B))S + (r_D(1 - t_D) - r_B(1 - t_B))D \\ + (r_A(1 - t_A) - r_B(1 - t_B))A)\} \end{aligned} \quad \text{(A1)}$$

We now show that the level of K which maximizes (A1) also maximizes the value of the firm net of investment (V-K). Using (3) and D=sV, we can write

$$r_D D(1 - t_D) = r_D sV(1 - t_D) = s[K + F(K)(1 + \theta)(1 - \tau) - V](1 - t_D) \quad \text{(A2)}$$

Using (A2) and maximizing (A1) over K yields

$$E\{U_1\}(V_K - 1) + E\{U_2[F'(1 + \theta)(1 - \tau)(1 - t_D) - (V_K - 1)(1 - t_D) - r_B V_K(1 - t_B)]s\} = 0 \quad \text{(A3)}$$

Equation (A3) implies that the household would maximize the value of the firm, i.e. set V_K=1, if the marginal investment in the domestic firm with a second period return $F'(1 + \theta)(1 - \tau)(1 - t_D)$ was a separately traded security. Since this is not the case, the possibility arises that all individuals might value the return from the marginal investment in the domestic firm differently. However, it can be shown in this model that the return from the marginal investment in this model is equivalent to the return from the following portfolio. Consider a portfolio where an amount $F'V/F$ is invested in shares of the domestic representative firm and an amount $\left[F - F'K - F't_D(V-K)\right]/F(1+r_B(1-t_B)$ is invested in the riskless asset. This portfolio yields a second period cash flow of

$$\frac{F'V}{F}\left[1+r_D(1-t_D)\right]+\frac{F-F'K-F't_D(V-K)}{F} \tag{A4}$$

Using (A2) and making some rearrangements, this cash flow can be written as

$$\frac{F'}{F}\left[K+F(1+\theta)(1-\tau)(1-t_D)+t_D(V-K)\right]+\frac{F-F'K-F't_D(V-K)}{F} \tag{A5}$$

which collapses to

$$1+F'(1+\theta)(1-\tau)(1-t_D) \tag{A6}$$

Thus, all households can implicitly trade in a composite security with a return which is identical to the return from a marginal investment in the domestic firm. Therefore, the first period value of this portfolio must be equal to one dollar, and the after tax rate of return is $F'(1+\theta)(1-\tau)(1-t_D)$. As a consequence, optimal portfolio investment by the representative household implies

$$E\left\{U_2\left[F'(1+\theta)(1-\tau)(1-t_D)-r_B(1-t_B)\right]\right\}=0. \tag{A7}$$

Substituting (A7) into (A3) shows that V_K=1 must hold.Q.E.D.

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