

THE 1986 US TAX REFORM AND THE WORLD CAPITAL MARKET

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1. Introduction

The 1986 U.S. tax reform was a policy of tax cut cum base broadening.¹ Among other things, the corporate and personal tax rates were reduced, the Investment Tax Credit (ITC) was lifted, the depreciation periods of the Accelerated Cost Recovery System (ACRS) were lengthened, and realized capital gains became fully included in the personal tax base. This paper gives a brief overview of the main effects on international capital movements that these measures may have, drawing on related and more elaborate discussions of the subject in Sinn (1987a, Ch. 7, and 1987b). The analysis focuses on the interactions between the real and financial spheres of the economy and, unlike most of the existing literature on taxation and international capital flows, it is based on a microfoundation of the tax influence on the firms' marginal investment conditions. The main result is that, in the presence of accelerated depreciation and the residence principle for interest income taxation, not only the base broadening, but also the tax cuts, may expel capital from the United States.

2. How to approach the problem

A convenient attempt to predict the effects of the reform would be simply to focus on its revenue implications. However, although popular, this attempt is clearly inadequate. It neglects the neutrality properties of certain components of capital income taxation and it overlooks the trivial fact that the incentives produced by a tax system depend on the derivatives of the tax revenue with regard to private decision variables rather than on the size of the tax revenue itself.

A more sophisticated approach involves calculating the King–Fullerton type of tax wedge between the marginal product of capital and the consumer

¹See Tax Reform Act of 1986, Conference Report to Accompany H.R. 3838, 2 Volumes, Washington 1986; U.S. Government Printing Office.

rate of time preference (i.e., the savers' net rate of return).² Unfortunately, however, such an approach would not be adequate either. While the wedge between the marginal product of capital and the consumer rate of time preference is crucial for predicting the growth repercussions of the reform, it has no obvious implications for international capital movements.³ It is important to see why this is so.

Consider fig. 1 which determines the net capital import of a small country that faces a given world interest rate r . The downward and upward sloping curves represent the marginal product of capital (MPC) and the consumer rate of time preference ($CRTP$) as functions of domestic savings and investment, respectively. Suppose the tax system drives a wedge of size A between the marginal product of capital and the market rate of interest and a wedge of size B between the latter and the consumer rate of time preference. Then, given r , savings is OS , investment is OI , and the capital import is SI . The King-Fullerton wedge in this example is $A + B$. Obviously, it is meaningless for the capital import as this is a rising function of the B wedge and a falling function of the A wedge.

The deeper reason for the irrelevance of the King-Fullerton wedge is the residence principle for the taxation of international interest income flows. This principle is applied by the United States and most of its trading partners, and it implies that an investor is indifferent in the choice between domestic and foreign financial investment when the gross or pre-tax rates of

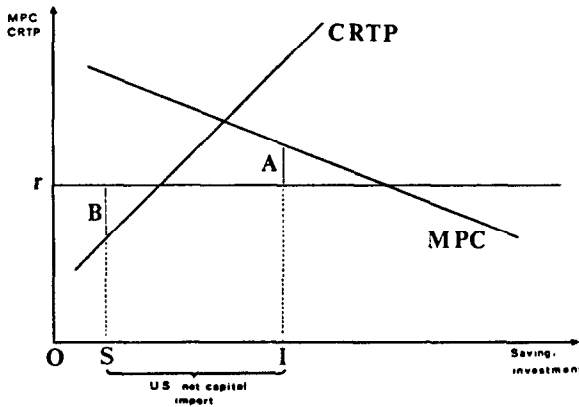


Fig. 1. The tax wedges.

²See Fullerton and King (1984).

³It seems that, in the political sphere, this is perceived differently. Fullerton and King never claimed, however, that their international comparisons of tax wedges could be used to predict a country's attractiveness for international capital.

return are the same.⁴ The residence principle links the pre-tax domestic market rate of interest to the respective rate in the rest of the world. If, by way of contrast, the source principle were applied to the taxation of border crossing interest income flows then there would be a tendency towards equality in the post-tax interest rates. In the above example this would mean that not r , but $r - B$ is fixed abroad so that the capital import would indeed be a function of the sum of the A and B wedges.

The United States is not a small country and, contrary to the previous assumption, its tax reform will certainly affect the world interest rate r . This fact does not invalidate the distinction between the A and B wedges though. In the large country case, fig. 1 can be used to determine the U.S. net capital import for alternative levels of r , i.e., to determine a complete capital demand curve. A similar curve exists for the rest of the world, and an equilibrium in the world capital market is determined by that interest rate at which the sum of the net capital demands is zero. Any measure that raises the A wedge or reduces the B wedge in the United States lowers the world interest rate and, as in the small country case, reduces the U.S. net capital import.

Algebraically, the B wedge can simply be defined as

$$B = \tau_p r, \quad (1)$$

where τ_p , $0 \leq \tau_p < 1$, is the personal income tax rate of the representative U.S. saver and r the interest rate.⁵ For savers in the top income categories the reform reduced the marginal personal tax rate from 50 to 28% and similar rate cuts occurred in other tax brackets. It is therefore clear that the reform reduced the B wedge and that, via a stimulation of private savings, there is a tendency for the U.S. capital import and the world interest rate to fall.

But what happened to the A wedge? An answer to this question is by no means trivial and it seems to be more important than knowing how the B wedge was affected. In the short and medium run, the variation in the capital supplied out of savings is certainly less important than the variation in the capital demanded for real investment. The former is a flow phenomenon, the latter, in principle, a stock phenomenon. Thus, the MPC curve in fig. 1 may be very elastic relative to the $CRTP$ curve, and the position of the U.S. net capital demand curve may depend primarily on the A wedge.

⁴Cf. Model Double Taxation Convention on Income and on Capital, Paris 1977: OECD, where the residence principle for interest income flows is established as a general rule for double taxation treaties. It is true that, according to the OECD convention, the source country still has the right to impose a withholding tax of up to 10% (see articles 11 and 23 A2). However, the residence country then must allow the deduction of the withholding tax from its own personal or corporate income tax. As the marginal rates of the two latter taxes are usually above 10%, the withholding taxes are irrelevant for international capital movements.

⁵For simplicity, and without implications for its results, this paper neglects the diversity of personal tax rates among U.S. residents.

This paper does not derive an algebraic expression for the A wedge but uses a formula that follows directly from one derived in Sinn (1987b, Appendix 2):⁶

$$A = r \left[(\varepsilon - s) \frac{1 - \tau_p}{(1 - \tau_r)(1 - \tau_c)} - \varepsilon - \alpha \tau_r (1 - s) \right] - \delta s. \quad (2)$$

Here ε is the minimum marginal equity-asset ratio; s , $0 \leq s < 1$, the rate of *ITC*; τ_r , $0 \leq \tau_r < 1$, the corporate tax rate on retained profits; τ_c , $0 \leq \tau_c < 1$, the effective tax rate on accrued capital gains, and δ , $\delta > 0$, the true economic depreciation rate. The parameter α , $0 \leq \alpha \leq 1$, measures the degree of acceleration in depreciation allowed for tax purposes where the extremes of true economic depreciation and immediate write-off correspond to $\alpha = 0$ and $\alpha = 1$.

Eq. (2) is an implication of a competitive firm's attempt to maximize its market value by choosing the time paths of its stock of capital, its employment of labor, its stock of debt and its issues of new shares subject to the constraints that shares cannot be repurchased and that at least the proportion ε of real net investment must be equity financed. It is assumed that $s \leq \varepsilon \leq 1 - \alpha \tau_r (1 - s)$, i.e., that, at the margin, the required minimum equity formation is no less than the *ITC* (s) and no more than the part of net investment not financed with tax deferrals [$1 - \alpha \tau_r (1 - s)$]. The market value function the firm maximizes is derived from an arbitrage condition that defines an equilibrium in the capital market and requires identical after-tax rates of return for bonds and shares at each instant of time.

Assuming that firms are regularly paying dividends, that capital gains are taxed on a realization rather than accrual basis, and that retained profits are taxed at least as heavily as personal interest income [$1 - \tau_p \geq (1 - \tau_c)(1 - \tau_r)$], the optimization problem of the firm can be shown to imply that profit retentions rather than new share issues are the marginal source of equity finance and that debt is equivalent or superior to retentions. The latter implies that firms are either indifferent in the choice between retentions and dividends or prefer to distribute that portion of profits not needed for investment finance. These financial preferences of the firm seem roughly compatible with the facts, more compatible, at any rate, than those underlying Jorgenson-Harberger types of cost of capital formulae which exclude the possibility of equity formation through profit retentions and sometimes even neglect debt financing.⁷ As reported in Sinn (1987a, p. 92), in the period from 1960 to 1985, on average 67.8% of gross investment by U.S. non-financial corporations was internally financed, 31% was debt financed, and only 1.2% was financed by net share issues.⁸

⁶By solving equation (A 21) for $(f_k - \delta) - r$ and setting $f_k - \delta \equiv MPC$.

⁷See Fazzari (1987) for an analysis of the corporate tax cut and the changes in the *ITC* and the *ACRS* from the viewpoint of a traditional Jorgenson-type cost of capital formula.

⁸Cf. King (1977) and Auerbach (1983) for related discussions of the tax influence on the firm's investment decision under alternative financial assumptions.

Note that, according to eq. (2), the A wedge is not necessarily positive. It is zero if the conditions of the Johansson–Samuelson theorem apply ($s = \alpha = \tau_c = 0$, $\tau_p = \tau_r$) or if, as in a classical system of corporate income taxation like that of the United States, there is a Miller equilibrium without artificial investment incentives [$(s = \alpha = 0, 1 - \tau_p = (1 - \tau_r)(1 - \tau_c))$]. With accelerated depreciation or the *ITC*, A will be negative if the tax system does not heavily discriminate against retentions relative to debt [$1 - \tau_p \approx (1 - \tau_r)(1 - \tau_c)$] or the firm enjoys a sufficient degree of financial flexibility in the sense that $\epsilon - s$ is sufficiently small.

The next sections discuss the implications of eq. (2) for the direction of international capital flows.

3. The base broadening

The *ITC* that was lifted by the tax reform had meant that most equipment enjoyed a 10% subsidy on the purchasing value, deductible from the corporate tax liability. In eq. (2), this implies that s is reduced from 0.1 to 0.

With the introduction of the *ACRS* in 1981, the depreciation period for most equipment had been reduced from 8–12 years to 5 years.⁹ The 1986 reform maintained the *ACRS* but increased the typical depreciation period to 7 years. If the Asset Depreciation Range System that was in operation before 1981 is interpreted as describing true economic depreciation, these measures are equivalent to raising α from 0 to about 0.5 and then back to 0.3.

Before the 1986 tax reform, 40% of realized capital gains were included in the personal tax base and before 1981 50%. Now *all* realized capital gains are included. Taking into account the usual holding periods of company shares, it had been estimated that, before 1981, the equivalent tax rate on accrued capital gains was 1/4 of the representative shareholder's marginal personal tax rate.¹⁰ The latter was probably between 40 and 50% before the reform and now it is 28%. This means that the effective tax rate on accrued capital gains τ_c increased from a value between 9 and 11% to about 14%. Despite the cut in personal tax rates, the 1986 reform increased the tax burden on capital gains.

To see what the base broadening effects imply for the direction of international capital movements, differentiate A for s , α and τ_c :

$$\frac{dA}{ds} = -r \left[\frac{1 - \tau_p}{(1 - \tau_r)(1 - \tau_c)} - \alpha \tau_r \right] - \delta < 0, \quad (3)$$

$$\frac{dA}{d\alpha} = -r \tau_r (1 - s) < 0, \quad (4)$$

⁹See Sinn (1984) for the influence of the *ACRS* on international movements.

¹⁰Cf. Fullerton et al. (1981, p. 684).

$$\frac{dA}{d\tau_c} = r(\varepsilon - s) \frac{1 - \tau_p}{(1 - \tau_r)(1 - \tau_c)} \geq 0. \quad (5)$$

As $ds, d\alpha < 0$ and $d\tau_c > 0$, these equations reveal an increase in A and hence a reduced capital import into the United States. This confirms popular beliefs and does not need detailed explanation. Note, however, that unlike the repeal of the *ITC* and the prolongation of depreciation periods, the increased capital gains taxation will expel capital from the United States only if U.S. firms' financial flexibility is limited in the sense that some equity capital in addition to the *ITC* is needed at the margin ($\varepsilon > s$) even when the tax system discriminates against this source of finance. In the extreme case $\varepsilon = s$ where an additional unit of capital is exclusively financed with debt, tax deferrals ($\alpha\tau_r$) and the *ITC*(s), the capital gains tax increase would be neutral simply because there are no capital gains from marginal investment projects.

4. The tax cuts

In addition to the personal tax cut which now implies a marginal tax rate of 28% for the representative shareholder, the United States reduced the typical corporate tax rate from 46 to 34%. This value is among the lowest in the world.

It is a popular belief that the tax cuts counteract the base broadening and will therefore imply that the reform does not greatly affect American investment or the direction of international capital flows. This belief cannot be confirmed. It is true that the tax cuts counteract the base broadening in terms of revenue and in terms of the King-Fullerton wedge. However, this is not so with regard to the A wedge, i.e., with regard to America's investment demand with any given level of the world interest rate.

This can be shown by differentiating (2) for τ_p (given τ_c) and for τ_r :

$$\frac{dA}{d\tau_p} = - \frac{r(\varepsilon - s)}{(1 - \tau_r)(1 - \tau_c)} \leq 0, \quad (6)$$

$$\frac{dA}{d\tau_r} = r \left[(\varepsilon - s) \frac{1 - \tau_p}{(1 - \tau_r)^2 (1 - \tau_c)} - \alpha(1 - s) \right] \geq 0. \quad (7)$$

Eq. (6) reveals that the cut in personal tax rates is neutral when firms are fully flexible in choosing their financial instruments ($\varepsilon = s$) and that it drives capital out of the United States when they are not ($\varepsilon > s$). The reason for the latter is a portfolio effect. The tax cut favors personal investment in the capital market over profit financed real investment within American firms. This induces firms to invest less and to pay out more dividends which the shareholders can then invest in the capital market. In a closed economy, the

market rate of interest must fall until the additional funds are again absorbed by the industry. In an open economy like that of the United States, however, the decline of the interest rate will drive some of the funds abroad. There they can earn an interest return which, because of the residence principle, will also benefit from the American tax cut.

It might be tempting to object to this result that the personal tax cut not only benefits foreign interest, but also domestic dividend income and that there would hence be no portfolio effect of the kind described. However, eq. (2) was derived assuming that τ_p applies to interest *and* dividend income and it invalidates this objection. A reduced dividend tax burden in itself is neutral since it favors existing capital, but leaves new capital unaffected. It would favor the latter only if new share issues rather than profit retentions were the marginal source of equity finance. This, however, would neither be compatible with the empirical facts nor with the goal of market value maximization. It is important to realize that dividend taxes are neutral, when they are paid, for then it is possible to retain more profits for additional investment projects and this is cheaper than issuing new shares. Only in periods where the dividend taxes are not paid, because there are no dividends and profits are absorbed for internal investment, can these taxes affect a firm's investment decision, for only then can the firm be forced to generate equity capital by issuing new shares. Note, however, that *all* American firms must be profit exhausted in order to cancel the portfolio effect. As long as some firms pay dividends, it clearly remains present.

Consider now the role of corporate taxation. Eq. (7) shows that the cut in the corporate tax rate has ambiguous effects. The corporate tax cut is neutral with true economic depreciation ($\alpha=0$) and full financial flexibility ($\varepsilon=s$), but with a limited degree of financial flexibility ($\varepsilon>s$) it can reduce the *A* wedge and stimulate American investment and with accelerated depreciation ($\alpha>0$) it can do just the opposite.

There is no reliable information on the firms' marginal degree of financial flexibility as measured by ε . Only the rising debt-equity ratios of the past indicate that ε must have been far below the average equity-asset ratios. However, there can be little doubt that the United States allow for a substantial degree of accelerated depreciation even after the 1986 reform. The value of $\alpha=0.3$ was mentioned above to characterize the new version of the *ACRS*. Obviously, this means that the case where the corporate tax cut in itself discriminates against American investment cannot easily be excluded. Whether it actually prevails or not, it is an interesting case that forces us to reconsider our prejudices on the effects of tax rate changes.¹¹

The theoretical explanation of this seemingly paradoxical case is that the *ACRS* in itself is a subsidy of marginal investment projects whose size is

¹¹See Sinn (1987a, Chapter 5) for an extensive discussion of the so-called 'taxation paradox' that is underlying this case.

proportional to the corporate tax rate. The corporate tax is a burden on the returns from equity capital, but an increase in the firm's stock of capital that is not accompanied by an increase in the stock of equity capital reduces this burden. This is why, with a sufficiently low value of ϵ , the firm's desired stock of capital is positively related to the corporate tax rate.

While the ambiguity with regard to an isolated cut in the corporate tax rate cannot be resolved here, there are two robust implications of eqs. (2), (6) and (7) that are worth pointing out.

One is that, given that the *ACRS* is still in place, either $dA/d\tau_p < 0$ or $dA/d\tau_r < 0$, or both. Thus at least one of the seemingly paradoxical results must be true whatever the degree of financial flexibility. Either a corporate tax cut or a personal tax cut will imply a capital export, and the weaker the forces producing one result, the stronger those producing the other.

The second aspect is that, given the *ACRS*, a simultaneous cut in both the corporate and personal tax rates that does not greatly affect (or that increases) the ratio $(1-\tau_p)/(1-\tau_r)$ will induce a capital export whatever the firms' degree of financial flexibility. This is not difficult to understand. A simultaneous tax cut that leaves the ratio $(1-\tau_p)/(1-\tau_r)$ constant favors foreign financial investment just as much as domestic real investment if, and only if, true economic depreciation is required for tax purposes. The *ACRS* in itself favors domestic real investment over foreign financial investment, the more the higher the tax rates. For this very reason foreign financial investment benefits more from the tax cuts than domestic real investment when the *ACRS* is in place.

With $\tau_p=0.28$ and $\tau_r=0.34$ as typical post-reform values, the ratio $(1-\tau_p)/(1-\tau_r)$ is now 1.09. Before the reform, τ_r was in most cases 0.46 but the appropriate value of τ_p is somewhat unclear. With $\tau_p=0.41$, the ratio $(1-\tau_p)/(1-\tau_r)$ would just have remained constant. As the maximum personal tax rate was 50% before the reform, a rate of 41% would not have been implausible for the representative shareholder; i.e., the shareholder who ultimately controls the firm's investment policy. Probably the true marginal rate was even higher. Thus, there can be little doubt that, concerning the portfolio effects analyzed in this paper, the tax cuts reinforce the base broadening effects and imply that the American capital imports and the world interest rate will be reduced for an even stronger reason.

5. A final remark

This paper briefly discussed the effects of the 1986 U.S. tax reform for international capital movements, focusing on the interactions between domestic real and international financial investment. It did not consider the role of direct investment. For this the reader is referred to Sinn (1987a, Ch. 7, and 1987b). Direct investment is affected by the tax system in a way quite

different from financial investment, and for its returns the residence principle is not of particular importance. It can be shown that the repeal of the *ITC*, the prolongation of depreciation periods and the cut in the corporate tax rate have the same, partly ambiguous, effects on the direction of capital flows as discussed above. However both the personal tax cut and the rise in the effective capital gains tax rate reduce the investment demand of U.S. corporations operating abroad. Theoretically, the net effect of the 1986 reform on direct investment is therefore ambiguous, but whatever its sign, it is likely to be of a much smaller order of magnitude than the effects on portfolio investment. Empirically, there can be no doubt that, in the short and medium run, financial market operations are the dominant channel of international capital movements and this is what the present paper discussed.

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