Capital Income Taxation and Resource Allocation

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Chapter 11: Alternatives to Capital Income Taxation

Chapter 11

ALTERNATIVES TO CAPITAL INCOME TAXATION

The previous chapters investigated the allocative and distributional effects of capital income taxation. This chapter is concerned with a search for allocatively neutral ways of taxing capital, in particular ways that avoid the retardation of economic growth found in Chapter 9.

Traditionally, the discussion of the growth effects of taxation centered around the question of whether the existing forms of taxing wages and capital incomes should be replaced with Kaldor's expenditure tax,¹ and, following a report to the U.S. Department of the Treasury (1977) advocating such a measure, this question has been the subject of vigorous debate in the Anglo-Saxon countries. Nevertheless, the possibility must be reckoned with that the discussion about the Kaldor-type expenditure tax is no longer promising. There are a number of reasons why the possibility of realizing this tax is presently viewed with scepticism. One reason is that the discrimination against the labor supply by the expenditure tax has raised doubts whether, on theoretical grounds, this tax would really be preferable to an income tax. The considerations of Chapter 9.6 dissipated some of these doubts, but clearly there are different opinions.² Another reason is that the previous discussion seems to have overestimated the political feasibility of the reform. It is true that the bad experiences that India and Ceylon/Sri Lanka (1959-1962, 1976-1978) had with the expenditure tax cannot be simply transferred without further examination to developed industrial societies; but the reluctance of politicians to introduce radical reforms is certainly reinforced by these experiences. Moreover, there remains a widespread scepticism as to whether the expenditure tax would be distributionally just. The dominant opinion is that it would favor the rich, as these consume a lower proportion of their incomes.³ A stepwise limited

¹Cf. the literature cited in the introduction to Chapter 9.

²Cf. Zumstein (1982).

³For a criticism of this view see Sinn (1985a, pp. 244 n.).

extension of indirect taxes on consumption is certainly politically enforceable. However, the abolition of corporate and personal income taxation and its replacement with a personal consumption tax certainly seems to go beyond what is feasible in the foreseeable future.

In the light of these difficulties, a somewhat different path towards allocative neutrality of taxation will be explored here. Instead of further investigating the possibilities of *replacing* labor and capital income taxation with a personal expenditure tax, the more limited question of whether it is possible to improve capital income taxation itself will be discussed. The goal is to avoid the retardation of economic growth and other disadvantages brought about by the existing systems of capital income taxation without creating big upheavals in the tax system. Corporate taxation, for instance, should be modified rather than abolished, and as many provisions of the existing tax laws as possible should be maintained. This line of research bypasses the problems of wage taxation,⁴ concentrates on that part of income taxation that might be creating the most serious distortions at present, and aims at minimizing the opposition of the politicians.

The chapter has five sections. The first section addresses the question of the appropriate goals of a tax reform. The optimality of laissez-faire growth, formally "proved" in Chapter 2, is critically reexamined, and an attempt is made to find out what degree of generality can be claimed for reform proposals whose aim is to stimulate economic growth. The second section defines a number of further postulates for the construction of a reformed tax system. The third section analyzes four familiar reform alternatives, among them the proposals of Kay and King and the Meade Committee, and the fourth section presents another proposal that has the advantage of being quite easily implementable in practice. In the fifth section, the last one of this book, the alternatives are compared with the existing systems of capital income taxation.

11.1. The Desirability of Growth Neutrality

In Chapter 2, the congruence between the social optimum and the laissezfaire allocation was emphasized as a special characteristic of the model framework used in this book. This congruence implies that government

⁴ It is left open whether the present form of taxing wages is to be maintained or whether a neutral form of labor taxation is to be designed that reduces or avoids the distortions in the labor-leisure choice.

intervention is unnecessary to steer the economy towards its optimal growth path and that growth neutrality of fiscal taxation is an appropriate postulate for a tax reform. But is it really justifiable to assume optimality of laissez-faire growth? After all, the literature has provided weighty counterarguments to this view. Does it make sense, in the light of these counterarguments, to study reforms that imply a growth neutrality of the tax system? These are questions that will now be addressed.

11.1.1. Bad Preferences

It is a popular view that market forces are unable to provide for satisfactory growth as the preferences of private agents cannot be accepted from the point of view of the "true" social welfare function. Two variants of this position can be distinguished.

One concerns the life-cycle planning of an individual and traces back to von Böhm-Bawerk (1888, pp. 332–338) and Pigou (1932, p. 25). Both of these authors hold the view that, when deciding about saving and consumption, young people underestimate the wants they will have when they are old. In retrospect they regret their decisions. Pigou (p. 25) even speaks of "wholly irrational preference".

With this view, economic decision makers are declared to be immature. Like children, they have to be forced into behaving in a way that they will only at a later stage understand and agree with. Although this "theory of bad preferences" may be justified in particular cases, it seems bold to contend its general validity and to diagnose a fundamental growth insufficiency on its basis. The theory is neither in accord with the ethic of individualism, on which Paretian welfare theory is built, nor is it compatible with the idea of democracy as understood in the Western world.

Another variant of the "bad preferences" theory was mentioned by Pigou (1932, p. 29 n.) and advocated with particular vigor by Page (1977, Part III). It concerns the bequest of resources to future generations.⁵ Even in the absence of all market imperfections, it is argued, private bequest decisions provide for an insufficient intertemporal transfer of resources since future generations have no vote in the decision making process. The well-being of future generations is taken into account by market forces only to the extent that the living generation has an altruistic concern for future generations, but, so Pigou and Page, this is not enough.

⁵A similar view is held by Mishan (1981, Chapters 67-69). Cf., however, Siebert (1980 and 1983, Chapter 15).

We came across this view with the overlapping-generations model in the form of a missing bequest motive, and it certainly enjoys much popularity among economists and the public. Much of the environmentalist position can be attributed to it. Nevertheless, it, too, is not compatible with Paretian, individualistic ethics.

To suggest the deficiencies of market allocation, Page takes the example of a "Mr. Nought" who faces some undefined, anonymous future generations. Intuitively, it then seems plausible that private care for the future might be insufficient. As there is no apparent connection between Mr. Nought and the future generations, the idea of external effects might occur to the reader. But this is not what Page means. His reasoning assumes perfect markets and hence intertemporally perfectly defined and warranted property rights. To see the point he makes most clearly, it should not be asked how Mr. Nought treats anonymous future generations, but what *parents* are willing to give to their *children* in the form of funding their education or leaving them a bequest, for example. What Page really contends is that parents do not spend enough money for these purposes or, even more pointedly, that they misuse the custody they have of their children.

This, too, is a daring contention which, had it been spelled out clearly, certainly would have provoked more criticism than the abstract reasoning the author engaged in. Who should have care and custody anyhow? Which authority could claim the right to know better how resources should be distributed among the individuals owning them today and their descendants? At least in democratic societies, the government could not be such an authority simply because future generations do not participate in today's elections. Even if the thesis of a neglect of future generations were correct, it would be irrelevant from a policy perspective. Whatever some economists' value judgements are, under the present political circumstances, no reform of the tax system, whose purpose is to benefit future generations more than the present generation wants to, would have any chance of being realised.

Yet, it does not seem obvious that this is alarming. It is true that future generations do not participate in today's saving-consumption decisions. To conclude from this that the resources their predecessors deliberately leave to them are insufficient would be hasty, however. Preferences, in particular ones that concern the wellbeing of one's own descendants, are ultimately biological phenomena. The maximization of genetic survival probabilities is the basic preference that all creatures have in common. Depending on the peculiarities of the process of evolution, this basic preference has manifested itself in a large number of derived preferences on more detailed issues. However, no matter how different these derived preferences are or how loose the connection with the basic preference seems, no species, homo sapiens included, has been able to afford developing preferences that imply a systematic and fundamental distributional conflict between the generations which is settled at the expense of the descendants. The selfish gene is clever enough not to consume all resources at once, for any genes that tried this are no longer there.

A priori, it may seem plausible perhaps to draw an analogy from the static distributional conflict between individuals living at one point in time to the relationship between different generations. However, such a conclusion by analogy does not do justice to the biological facts in the development of human preferences. Rivalry and hostility, even collective mutual slaughter, are sad but typical characteristics of the relationship among the individuals of a generation. But who would claim that the relationship between parents and their descendants is of a similar kind? From the breeding instinct, well developed in the human species, to the virtue of thrift,⁶ characterizing the moral code of most developed cultures, nothing suggests that homo sapiens is a species that is *inclined* to neglect its descendants. Not a distributional *conflict*, but a distributional *harmony*, between the generations is the rule.

11.1.2. Defects of the System

A rejection of the view that private preferences cannot be accepted from a social perspective does not imply the contention that people behave in a way that is compatible with the well-being of their descendants. Indeed there are reasons enough why there may be no such a compatibility. However, they relate to the construction of the cultural, political, and economic systems within which people act rather than to people's pre-ferences. Some of the reasons that might be relevant for developed economies will now be discussed.

In the static allocation process, monopolistic market structures are important sources of misallocation since, similarly to sales taxes, they drive wedges between supply and demand prices. Probably the same is true with the intertemporal allocation process, but little is known about this problem. Provided the tax analogy is correct, it can be expected that monopolistic

⁶Weber (1920, especially p. 180) attributed this virtue to the Protestant Ethic which he believed to be the driving force behind the development of capitalism.

market structures in capital goods or credit markets operate in a way similar to a tax on the factor capital or to a general capital income tax; they drive wedges between the marginal product of capital and the rate of time preference and retard the process of economic growth. On the other hand, market imperfections in consumption goods markets seem to create fewer problems. Provided the degree of monopoly is time-invariant, such imperfections will act like a consumption tax and thus will not result in intertemporal distortions.⁷ All this is mere speculation that should be confirmed in sound theoretical models, but it creates the impression that monopolistic market structures, if they create intertemporal distortions at all, tend to slow down the process of growth.

As a second standard reason for allocative distortions, external effects should be mentioned; that is, noncompensated advantages or disadvantages the actions of an individual bring about for other parties. In the intertemporal context, two types of externalities seem particularly important: imperfectly warranted property rights and wealth redistributions caused by crossing family lines through marriage.

Consider first the marriage problem.⁸ Let property rights be warranted in the sense that children actually inherit everything their parents bequeath them. Suppose parents are primarily concerned with their own children's well-being and not so much with that of their children-in-law. Assume that children and inlaws share equally in the bequest and that parents do not expect that a marginal increase in the size of their own bequest will induce the inlaw parents to also increase theirs. Under these circumstances, bequeathing is an activity that creates positive external effects between families. Fifty cents of each dollar of bequest benefits another family line.

To show that this situation involves a Pareto inferior size of bequests, two alternative thought experiments can be carried out. They have in common that they start from a situation of equilibrium under the above conditions and consider marginal variations in the level of bequests under other sociological or legal conditions.⁹

⁷A similar phenomenon becomes visible in the fact that monopolistic market structures do not necessarily distort the extraction path of natural resources. See Kay and Mirrlees (1975), Weinstein and Zeckhauser (1975), and Stiglitz (1976).

⁸Cf. Nerlove et al. (1984) for a related discussion.

⁹As usual, Pareto optimality is defined here exclusively with regard to private preferences and technological constraints. Sociological and legal constraints are not respected for the definition of Pareto optimality since the aim of our considerations is to explore the scope for useful reforms of these constraints. (The reforms that are considered in this chapter concern the introduction of better systems of capital income taxation.) If all constraints to human behavior are included in the definition of Pareto optimality then, quite trivially, no Pareto improvements are possible.

The first experiment is to assume that parents can make additional bequests to their children that do not have to be shared with inlaws. Except for the case where they have kinked indifference curves with regard to their own and their children's consumption, parents will definitely make use of this possibility. As the price of their children's consumption is cut in half and as this price cut is limited to additional units, there is no relevant income effect, but there is a clear substitution effect that raises the volume of bequests. Parents reveal through their behavior change that they are better off. As no one else is worse off, the initial situation must have been Pareto inferior.

The second experiment is to think of a contractual arrangement between parents and parents-in-law. Suppose they promise to mutually match each additional dollar of bequests they make where, however, the bequest again is jointly consumed by children and children-in-law. This, too, cuts the price parents have to pay for their own children's additional consumption in half and clearly induces the same welfare improving increase in the bequest volume as before.

This second thought experiment is in the spirit of the famous *isolation paradox* of Sen (1961) and Marglin (1963). These authors considered the case where testators have impartial altruistic concern for all members of the future generation. Under these circumstances a bequest to any member of the future generation is a public good that benefits all other testators, and, as with other public goods, the supply is insufficient if people decide in isolation. A cooperative agreement that internalizes the externalities in the decision problem of the single testator would increase the volume of bequests.¹⁰

. It is not clear how much weight these arguments should be given. An altruistic concern for all members of future generations seems implausible, and perhaps the externalities resulting from the mating process are not all that large. After all, there are ways of separating property within a marriage, and certainly there is some mutual matching of bequests when bequests are made (or promised) before the marriage. Only in fairy tales do princes marry Cinderellas; in reality they marry princesses.

A perhaps stronger reason for intertemporal misallocation than the marriage problem may be the problem of imperfect intertemporal guarantees of property rights.¹¹ Even though property rights may appear almost

¹⁰Lind (1964) and Usher (1964) pointed out that this result will no longer be true if one introduces a sufficiently strong altruism between the testators. It seems that this point has more theoretical than practical relevance though. Envy and rivalry seem to characterize the relationship between members of a generation better than altruism. Cf. Schoeck (1966).

¹¹This problem was analyzed by Long (1975) and von Weizsäcker (1980) in various contexts.

safe in the short and medium run, an extension of the time perspective reduces the probability that a stock of wealth will remain in the hands of those for whom it was intended. In a national context, one may think of political revolutions with successive wealth redistributions. In an international context, periods of military tension or even wars and economic crises can be mentioned which result in foreign properties being nationalized or redistributed among domestic inhabitants. Imperfectly warranted property rights undoubtedly impede the process of capital formation. Although accumulated wealth will not be lost for the society as a whole, the fact that a single saver or testator has to reckon with an expropriation of his own or his descendants' property creates an incentive not to accumulate so much. For this reason, too, the speed of economic growth resulting from a neutral taxation would be too low.

11.1.3. Implications for the Goals of a Tax Reform

We have considered various reasons for doubting that market processes by themselves can bring about an optimal intertemporal allocation of resources. Some of these reasons could not be accepted at all and others did not seem overly convincing. But whatever their validity, they all suggest that market forces, operating on their own, do not result in a sufficiently high rate of economic development.

The analysis of Chapter 9 also showed that the intertemporal allocation process, as it is organized in Western industrial countries, involves a too slow economic development. The reason, however, was different. An inappropriate construction of the tax system was there responsible for the intertemporal misallocation, not "bad" preferences, not monopolistic market structures, and not external effects.

The present chapter searches for growth-neutral tax systems. This must seem insufficient for those who believe in the importance of non-tax distortions. However, as at least *one* of the existing impediments to economic growth would be removed through the introduction of a growthneutral tax system, they should welcome this endeavor as trying to take a step in the right direction.

11.2. Other Goals of a Reform

Although our primary concern is growth neutrality, this criterion should not be the only one for an allocative evaluation of the tax system. A number of further postulates for a reformed system of capital income taxation, some of which have already been considered in this book, also merit attention. We will confine ourselves to examining the following eight.

Financial neutrality. A tax system that distorts the financial decisions of firms and allows these decisions to serve as a buffer protecting the real economy from tax-induced distortions is probably better than one that distorts the real decisions and is neutral with regard to the financial ones. However, an ideal system is one that is neutral with regard to both real and financial decisions. Such a system not only has the advantage that its real neutrality properties are independent of the firms' degree of financial flexibility, it also would end the worrying empirical trend towards debt financing that has been observed in many countries. Debt financing is problematic as it increases the risk of bankruptcy and makes the economy prone to economic crises. Financial neutrality should therefore be accepted as desirable in its own right for a reformed system of capital income taxation. To avoid excessive debt financing it is sufficient to construct the tax system in such a way that the firm's choice between debt and profit retentions is not affected. However, it is also desirable for the tax system to make firms indifferent between new share issues and debt financing. This would be particularly important for new firms whose net investment often exceeds profits.

Ability to raise revenue. There are taxes that do not raise revenue, but create distortions, and there are allocatively neutral taxes that do not raise revenue. Neither type of tax belongs in an efficient system of fiscal taxation. It is an indispensable requirement for a reformed system of capital income taxation that it be able to generate revenue, and it can even be postulated that the flow of revenue should grow proportionately to the main economic aggregates.

Acquisition neutrality. Mergers and take-overs impair the working of competitive markets and undermine the pillars of a democratic society. Thus, a reformed system of capital income taxation should be acquisition neutral. The appetite for take-overs whetted by the current tax systems must be reduced to prevent the economies of the West from serious damage.

Non-shiftability. A system of capital income taxation whose incidence falls on wage earners perverts the political intention which is typically behind it. If only for this reason, a non-shiftability of taxation is desirable. There is, however, an additional aspect that is of importance from an allocative point of view. If capital income taxation is growth neutral and does not affect the level of real wages, the problem of a distortion in the labor-leisure choice, crucial in the case of the consumption tax, disappears. It is true that such a choice has not been modelled here. However, if capital income taxation can be constructed in such a way that, given the exogenous path of labor supply, neither the households consumption plans nor the path of the real wage rate is affected, then even more complex models with an endogenous labor supply lack a point of attachment for allocative distortions.

Intersectoral neutrality. That the tax system should not distort the intersectoral allocation of resources is a generally accepted postulate, for, if a tax system that distorts the intersectoral structure of the economy is replaced with a neutral tax system, then, with given factor supplies, there is an increase in aggregate output that the government can, in principle, distribute among its citizens in such a way that no one is worse off, but some are better off.

International neutrality. The international neutrality of taxation has two dimensions. On the one hand, it is desirable for the rates of time preference of domestic and foreign households to be equalized despite taxation, as otherwise there would be an unexploited scope for mutually advantageous credit contracts. On the other hand, taxation should not prevent market forces equalizing the marginal products of capital across borders and hence maximizing the world production level. Both postulates are certainly satisfied with perfectly harmonized tax systems in the different countries.¹² However, particular virtues with regard to the international allocation can only be claimed for a tax system if these neutrality properties prevail despite international tax rate differences.

Practicability. Independently of all theoretical virtues, it is a necessary condition for a reformed tax system that it can be implemented in practice. If the existing tax systems can be interpreted as attempts to implement Schanz-Haig-Simons systems, then they are disastrous attempts. The requirement of true economic depreciation is only one example that demonstrates how difficult it is for the tax authorities to match the theoretical ideal. Something simpler than the Schanz-Haig-Simons system is urgently required.

Avoidance of radical changes. The more pronounced the deviation from the existing tax system which a reform proposal requires, the less are its chances of being implemented. A complete removal of particular taxes should certainly face significant or even prohibitive resistance. On the

¹² It has to be assumed, however, that, within a country, all inhabitants have the same marginal personal tax rate. Progressive personal taxes are incompatible with a Pareto efficient allocation as they result in even national differences in the rates of time preference. If progressive income taxation is desired in a reformed tax system, it would be better to implement it by taxing the returns on capital at a higher rate than wages.

scientific level, it is, no doubt, useful to think about abstract theoretical possibilities of a reform. However, if there are two alternative proposals for a reform that have the same allocative implications, then the less radical one should be preferred. "Old taxes are good taxes" is a wise saw that should not be forgotten when designing a tax reform.

11.3. Radical Reform Proposals

This section examines theoretical possibilities for a reform of capital income taxation that can be called radical in the above sense. A less radical proposal is presented in the next section.

11.3.1. Four Candidates for a Growth-neutral System of Capital Income Taxation

The starting point of our search for an improved system of capital income taxation is the problem of economic growth, for it is with respect to this problem that the existing systems have their most obvious, and perhaps most serious, allocative weakness. As shown in Chapter 9, this weakness results from the fact that a wedge is driven between the marginal product of capital $(\varphi' - \delta)$ and the subjective rate of time preference (γ) . This wedge slows down economic growth and results in intertemporal welfare losses.

For an ideal system that avoids the wedge ($\gamma = \varphi' - \delta$) it follows from (8.37) and (8.38) that

$$\dot{c} = \frac{c}{\eta} [\varphi'(k) - \delta - \gamma^{\infty}].$$

This equation is the equation of motion for consumption per efficiency units of labor. As it is identical with the laissez-faire equation, (2.48), it ensures a growth neutrality of the tax system.

An obvious way to remove the wedge between the marginal product of capital and the subjective rate of time preference is to install an investmentneutral tax system that induces firms to invest until the marginal product of capital equals the market rate of interest $(\varphi' - \delta = r)$ and, in addition, to remove the personal tax on interest income so that households are induced to save until their subjective rate of time preference also equals the market rate of interest ($\gamma = r$). The following taxes are therefore potential candidates for a reformed system of capital income taxation:

- (a) A tax on pure profits with true economic depreciation and deductibility of actual and imputed interest costs (α₁ = 0, α₂ = α₃ = 1, τ_d = τ_r > 0, τ_e = τ_p = τ_k = 0; cf. Chapter 5.3.1).
- (b) A tax on accounting profits with true economic depreciation and deductibility of only actual interest costs ($\alpha_1 = \alpha_2 = \alpha_3 = 0$, $\tau_d = \tau_r > 0$, $\tau_e = \tau_p = \tau_k = 0$; cf. Chapter 5.3.1).
- (c) The Brown tax (or R-Base tax) on the real cash flow that Kay and King (1978, pp. 200-203) recommended for Great Britain $(\alpha_1 = \alpha_3 = 1, \alpha_2 = 0, \tau_d = \tau_r > 0, \tau_c = \tau_p = \tau_k = 0$; cf. Chapter 5.3.5).
- (d) The S-Base tax on real and financial cash flows advocated by the Meade Committee (1978, Chapter 12) ($\alpha_1 = \alpha_2 = \alpha_3 = \tau_r = \tau_e = \tau_p = \tau_k = 0, \tau_d > 0$; cf. Chapter 5.3.6).

All four candidates are investment neutral and none interferes with the households' consumption-savings decisions. When the personal interest income tax, and with it the wedge between the market rate of interest and the consumer rate of time preference, is abolished they all ensure growth neutrality.

11.3.2. The Criterion of Non-shiftability

All four alternatives allow for a deduction of wage costs from the tax base. For this reason none of them is able to drive a wedge between the real marginal product of labor and the real wage rate. A look at (3.38) and (3.39) confirms this. Together with the growth neutrality, this fact excludes any shifting of the four taxes to wage earners.

As noted before, this also implies that none of the taxes would be able to drive a wedge between the real marginal product of labor and the marginal rate of substitution of consumption for leisure in more complex models with an elastic labor supply. A formal proof is not given here. For systems (c) and (d) it can be found in Sinn (1984a), where the role of taxation in an intertemporal general equilibrium with elastic labor supply and infinitely lived consumers is studied.

11.3.3. Financial Neutrality

The first differences between the four candidates appear with the criterion of financial neutrality.

With the pure profit tax and the Brown tax, (a) and (c), a change in actual

interest costs does not affect the tax base. As $\tau_d = \tau_r$ and $\tau_e = \tau_p = 0$, the financial preferences of Type 8 in Figure 4.3 apply, and it follows that new share issues, profit retentions, and debt financing are equivalent sources of finance from a tax perspective.

With the tax on accounting profits and the S-Base tax, (b) and (d), actual, but not imputed, interest costs are tax deductible and thus, in principle, the financial preferences distinguished in Figure 4.2 apply.

Because of $\tau_c = \tau_p = \tau_r = 0$, the S-Base tax (d) is associated with the preference of Type 4 in this figure which is characterized by an indifference between debt and retentions.¹³ Note that the Meade Committee wants new issues of shares to be treated as negative dividends so that Constraints (4.4) and (4.5) of the optimization problem of the firm become void. This implies that all three financial instruments are equivalent under the S-Base tax.¹⁴

The tax on accounting profits (b) is the only one of the four candidates that misbehaves. Because of $\tau_d = \tau_r > \tau_c = \tau_p = 0$, the preference of Type 2 in Figure 4.2 prevails. New issues of shares are equivalent to retentions, but both these forms of equity finance are strictly inferior to debt financing. The tax on accounting profits therefore does not satisfy the postulate of financial neutrality.

11.3.4. Conditions for an Acquisition Neutrality

The four candidates are also not identical with respect to the incentives for take-overs. To see this, the corresponding market value formulas must be found first. Using (5.19) and (5.20) for (b), it follows from the general formula (6.2) that

$M = K - D_{\rm F}$	(for (a)),	(11.1)
L .		(/

 $M = \theta(K - D_f), \quad \theta \equiv \theta_d = \theta_r \quad \text{(for (b))},$ (11.2)

$$M = \theta K - D_{\rm f}, \quad \theta \equiv \theta_{\rm d} = \theta_{\rm r} \quad \text{(for (c))}, \quad (11.3)$$

$$M = \theta_{d}(K - D_{f}) \qquad (\text{for (d)}). \tag{11.4}$$

¹³As $\tau_r = 0$, it would also be possible to interpret the S-Base tax as not allowing for a deduction of actual interest cost. The tax system would then be of Type 7 in Figure 4.3, and again debt and profit retentions turn out to be equivalent. These are only semantic differences. The text follows the Committee that described its tax as allowing for a deduction of real gross investment, net capital market investment, and actual interest cost. See (5.41) for this interpretation.

¹⁴Cf. Boadway et al. (1983) for an analysis of cash flow taxation under the assumption of imperfect markets.

Suppose now, Firm A takes a loan of size

$$\tilde{D}_{\rm f}^{\rm A} = M^{\rm B},\tag{11.5}$$

in order to buy Firm B's outstanding shares at the going market price. Then, according to the reasoning of Chapter 6.1.2, the market value of Firm A increases to the new value

$$\tilde{M}^{A} = M^{A} + M^{B} - \tilde{D}_{f}^{A}, \qquad (11.6)$$

for Taxes (a) and (c). The resulting capital gain of shareholders is

$$\tilde{M}^{A} - M^{A} = 0$$
 (for (a) and (c)). (11.7)

Both the tax on pure economic profits and the Brown tax are therefore acquisition neutral.

Like most of the existing systems of capital income taxation, the tax on accounting profits does not share this virtue. An acquisition neutrality can only be produced if an additional acquisition tax on the value of the purchased shares is levied. Let $\tau_M \ge 0$ denote the rate of this tax. Then the financial requirement of the acquiring firm A is defined by

$$\tilde{D}_{I}^{A} = (1 + \tau_{M})M^{B} \tag{11.8}$$

instead of (11.5). Its market value after the take-over is

$$\tilde{M}^{\mathrm{A}} = M^{\mathrm{A}} + M^{\mathrm{B}} - \theta (1 + \tau_{\mathrm{M}}) M^{\mathrm{B}}, \qquad (11.9)$$

and hence the wealth increase of Firm A's shareholders is

$$\tilde{M}^{A} - M^{A} = M^{B} [1 - \theta (1 + \tau_{M})].$$
(11.10)

If there is no acquisition tax, this wealth increase equals the product of the profit tax rate and the market value of the acquired firm:

$$\tilde{M}^{A} - M^{A} = \tau M^{B} \qquad \text{(for (b) with } \tau_{M} = 0\text{)}. \tag{11.11}$$

However, with a suitably chosen acquisition tax rate, perfect acquisition neutrality can be produced:

$$\tilde{M}^{A} - M^{A} = 0 \Leftrightarrow \tau_{M} = \tau/\theta \qquad \text{(for (b))}. \tag{11.12}$$

It is the essence of the Meade Committee's proposal (d) that the tax applies to the sum of the firm's real and financial cash flows, except for the financial cash flow between the firm and shareholder households. Thus the proposal implies taxing loans taken for the purpose of financing take-overs. To finance the purchase of a firm with market value M^{B} , it is therefore necessary to borrow the amount

$$\tilde{D}^{A} = M^{B} / \theta_{d}. \tag{11.13}$$

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As (11.4) implies that the market value of the acquiring firm A is

$$\tilde{M}^{A} = M^{A} + M^{B} - \theta_{d}\tilde{D}_{f}^{A} \tag{11.14}$$

after the transaction, it follows from (11.13) that the shareholders of this firm cannot gain from a take-over:

$$\tilde{M}^{A} - M^{A} = 0$$
 (for (d)). (11.15)

The Meade Committee's S-Base tax therefore shares the virtue of acquisition neutrality.

11.3.5. The Ability to Raise Revenue

Some differences between the four candidates have become visible. The most significant differences, however, show up with regard to their ability to raise revenue. At least one of them can be eliminated from the competition under this aspect.

11.3.5.1. The Tax on Pure Profits: No Representation without Taxation

The candidate eliminated is the tax on pure profits (a) that, among other things, allows for deduction of true economic depreciation, debt interest, and the normal returns to equity. As the wage rate equals the marginal product of labor (net of a potential value-added tax), the sum of interest and profit income under constant returns to scale equals the product of the stock of capital and the net-of-depreciation marginal product of capital:¹⁵

$$\varphi(k)L - \delta K - wL = [\varphi'(k) - \delta]K. \tag{11.16}$$

If actual and imputed interest costs, rK, are deducted from this and account is taken of the fact that the investment neutrality of the tax on pure profits implies $\varphi' - \delta = r$, it follows that the tax base and thus the tax revenue $T = T_d + T_r + T_p$ from capital income taxation is zero:

$$T = \tau(\varphi' - \delta - r)K = 0, \qquad \tau \equiv \tau_d = \tau_r. \tag{11.17}$$

Because of the oligopolistic and monopolistic market structures that are

¹⁵Here, $\varphi(k) \equiv f(K, L)/L = f(K/L, 1)$ is the standardized production function introduced in (2.46). Straightforward differentiation shows that $f_K = \varphi'$ and $f_L = \varphi - k\varphi'$ [cf. (10.14)]. Together with $w = f_L$ from (3.38) this implies (11.16).

observable in reality, this result may be overly pessimistic. There are certainly *some* pure profits that can be taxed. However, the model result shows that substantial revenue losses must be expected if one of the existing systems of capital income taxation, which include the returns on equity and bonds in the tax base, is replaced with the tax on pure profits.

11.3.5.2. The Tax on Accounting Profits

The tax on accounting profits comes off significantly better than the tax on pure profits as it is a tax on the normal returns to equity capital plus pure profits. There is, however, the problem that the tax discriminates against equity formation and hence induces firms to circumvent taxation through the choice of debt financing. The risk of an eroding tax base, at least in relative terms, can hardly be avoided with this tax.

The base of the tax on accounting profits is $\varphi(k)L - wL - \delta K - rD_f$. Using (11.16), the tax revenue can therefore be expressed as

$$T = \tau \{ [\varphi'(k) - \delta] K - r D_{\rm f} \}, \quad \tau \equiv \tau_{\rm d} = \tau_{\rm r}.$$
(11.18)

Debt financing of net investment and the property of investment neutrality imply that $K - D_f = \text{constant}$ and $\varphi' - \delta = r$. Thus, (11.18) becomes

$$T(t) = \tau r(t) [K(0) - D_t(0)] \quad \forall t \ge 0.$$
(11.19)

This expression shows that, in the case of full financial flexibility, the tax on accounting profits raises a revenue that is strictly proportional to the current market rate of interest, but is independent of the current stock of capital employed in the economy. For a growing economy, this implies a relative decline in the tax revenue. In a steady state where, with a constant rate of interest, national product grows at the strictly positive natural rate n + g, the tax-output ratio will shrink with this same rate.

For a comparison with the revenues other taxes are able to raise, it is useful to know the present value of revenue (B_T) this tax generates. This value can straightforwardly be calculated from (11.19):¹⁶

$$B_{\rm T}(0) = \tau [K(0) - D_{\rm f}(0)] \int_{0}^{\infty} r(t) \left[\exp \int_{0}^{t} - r(s) \, \mathrm{d}s \right] \mathrm{d}t$$

= $\tau [K(0) - D_{\rm f}(0)]$
= $\tau K(0) \varepsilon(0),$ (11.20)

¹⁶For the mathematical procedure cf. Equation (5.40).

where $\varepsilon(0) \equiv [K(0) - D_f(0)]/K(0)$ is the initial equity-asset ratio [cf. (5.11)]. Equation (11.20) shows that, in present-value terms, the tax on accounting profits is equivalent to a non-recurring capital levy on the existing stock of equity where the rate of this capital levy equals the profit tax rate.

11.3.5.3. Growing Tax Revenues with the Brown Tax

It seems to be a familiar prejudice among public finance economists that the Brown tax is a bad revenue raiser. The reader may have come across the contention that the revenue from the tax will run dry as the assets existing at the time of tax reform wear out or that the tax is unable to generate revenue in present-value terms. This section tries to find out whether this prejudice is justified.

The revenue from the Brown tax is $T = \tau [\varphi(k)L - wL - \delta K - I]$. Using (5.43), (11.16) and the property of investment neutrality, this expression can be transformed to

$$T = \tau[(\varphi' - \delta)K - I] = \tau K(r - \hat{K}), \quad \tau \equiv \tau_d = \tau_r.$$
(11.21)

According to this equation, the revenue generated by the Brown tax depends on the relationship between the rate of interest and the growth rate of the capital stock. A priori it is not obvious whether there is a revenue, and the prejudice that there is none might even be nourished by (11.21). Closer scrutiny is necessary to clarify the issue.

Recall the steady-state properties of the growth model developed in Chapters 2 and 9. It follows from (8.46) for the case of the Brown tax $(\theta_d^* = \theta_r^* = \theta_r \equiv 1 - \tau_r, \ \theta_p = \alpha_1 = \alpha_3 = 1, \ \alpha_2 = \tau_k = 0)$ that, as time goes to infinity, r approaches the steady-state rate of time preference: $\lim_{t\to\infty} r(t) = \gamma^{\infty} \equiv \rho + \eta g$. Moreover, $\lim_{t\to\infty} \hat{K}(t) = n + g$ and, according (8.49), it is a necessary condition for the existence of an intertemporal general equilibrium that $\gamma^{\infty} > n + g$. Taken together, these pieces of information imply that

$$\lim_{t \to \infty} [r(t) - \hat{K}(t)] = \text{constant} > 0.$$
(11.22)

This implication clearly refutes the prejudice. It not only reveals that the Brown tax will provide a positive revenue, it even indicates that, in the steady state, this revenue will grow in strict proportion to the other aggregates of the economy.

It is true that this result does not exclude the theoretical possibility that, before the economy is in the neighborhood of a steady state, there is a period of stormy growth $(\hat{K} > r)$ where the tax revenue is negative. However, the result is clearly not compatible with the view that the Brown tax cannot serve as a lasting source of revenue for the government, let alone the view that its revenue dries up when the assets existing at the time of the tax reform wear out.

Consider now the contention that there will be no tax revenue in presentvalue terms. It follows from (11.21) that the present value of tax revenue is given by

$$B_{\rm T}(0) = \tau \int_0^\infty \left[K(u)r(u) - \dot{K}(u) \right] \left[\exp \int_0^u - r(s) \, {\rm d}s \right] {\rm d}u. \tag{11.23}$$

Under the integrability condition

$$\lim_{t\to\infty}\left(K(t)\left[\exp\int_0^t-r(s)\,\mathrm{d}s\right]\right)=0,$$

which, if the economy approaches a steady state, is equivalent to (11.22), this integral can be calculated as

$$B_{\rm T}(0) = \tau \left[-K(u) \exp \int_0^u -r(s) \, \mathrm{d}s \right]_0^\infty = \tau K(0) > 0. \tag{11.24}$$

Contrary to the contention, a strictly positive present value of tax revenue is obviously assured.

It should be stressed that it was not assumed for (11.24) that the economy is permanently in a steady state, and, in fact, it is not even necessary to assume that it approaches one. Neither was it assumed that the current flow of tax revenue is always strictly positive. Provided the integrability condition is satisfied, the formula clearly holds independently of the time path of net investment and hence independently of the time profile of the revenue flow.

It is obvious from (11.24) that, as with the tax on accounting profits (b), the Brown tax can be compared to a non-recurring capital levy imposed at the time of the tax reform. An important difference is, however, the fact that this time the capital levy does not apply to the stock of equity capital, but to the total stock of assets installed. Given the tax rate, the present value of tax revenue will therefore be higher than with the tax on accounting profits.

Contrary to first appearances, this fact cannot be taken to imply that the Brown tax is able to generate a higher revenue than the tax on accounting profits. Inspection of (11.2), (11.3), (11.20), and (11.24) clearly shows that the value of equity before tax is always the upper limit of the present value of tax revenue. For the Brown tax this means that, in order to prevent firms from

becoming bankrupt, the tax rate must fall short of the initial equity-asset ratio before tax:

$$\tau < \varepsilon(0). \tag{11.25}$$

A higher tax rate would only be possible if provisions were introduced to exempt the returns from the existing capital stock totally or in part from the Brown tax, but of course this would not be a means of increasing the revenue.

In Chapter 5.3.5 it was shown that, with regard to the influence on investment decisions, the Brown tax (c) is equivalent to a tax on pure profits (a). At first sight, this result seems to contradict the result that the Brown tax raises revenue while the tax on pure profits is unable to do so. As noted earlier, this puzzle can easily be resolved if account is taken of the fact that, unlike the tax on pure profits, the Brown tax treats "old" and "new" capital very differently. It participates in the returns from both new and old capital, but, through the provision of an immediate write-off, it contributes only to the formation of new capital. This asymmetry is the reason that a revenue can be raised although the firms' investment decisions are not affected.

An equivalence of the two taxes in terms of the present value of their revenues could only be reached if the tax on pure profits were modified by limiting the deductibility of interest and depreciation to new assets, i.e., assets installed after the tax reform. Even then, however, there would remain the important difference that, in a growing economy, the tax-output ratio for the tax on pure profits converges to zero while the corresponding ratio for the Brown tax converges to a strictly positive constant.

11.3.5.4. The Revenue Raised by the S-Base Tax

Consider now the S-Base tax proposed by the Meade Committee. According to (5.41), the base of this tax is $\varphi(k)L - wL - \delta K - I - rD + S_f$. Using (11.16) and the property of investment neutrality, the current flow of tax revenue can be written as

$$T = \tau[(\varphi' - \delta)(K - D_{\rm f}) - (I - S_{\rm f})]$$

= $\tau[r(K - D_{\rm f}) - (I - S_{\rm f})],$ (11.26)

where $\tau \equiv \tau_d$. Unlike the Brown tax, the revenue of the S-Base tax not only depends on real economic variables but also on financial variables. The higher the net increase in debt compared to the existing stock of debt, the higher is the tax revenue.

Suppose the equity-asset ratio, $\varepsilon \equiv (K - D_f)/K$, stays constant over time,

a plausible case that harmonizes with the financial neutrality properties of the tax. In this case, it follows from (11.26) that

$$T = \tau \varepsilon K(\varphi' - \delta - \hat{K})$$

= $\tau \varepsilon K(r - \hat{K})$ (for ε = constant). (11.27)

Again it turns out that an excess of the interest rate over the growth rate of capital is a necessary and sufficient condition for revenue raising, and again (11.22) ensures that this condition is met in the neighborhood of a steady state. The only difference from the Brown tax is that the tax base is now proportional to the stock of equity capital (εK) rather than to the stock of total assets (K).

In general, (11.26) shows that the time pattern of tax revenue is sensitive to the firms' real and financial decisions. This sensitivity does not, however, carry over to the present value of tax revenue. To see this, integrate (11.26) assuming

$$\lim_{r \to \infty} \left(X(t) \left[\exp \int_0^t - r(s) \, \mathrm{d}s \right] \right) = 0 \quad \text{for } X = K, \ D_f$$

and using $I \equiv \dot{K}$, $S_{\rm f} \equiv \dot{D}_{\rm f}$. Irrespective of the time paths of capital and debt this gives

$$B_{T}(0) = \tau \int_{0}^{\infty} \{ [K(u) - D_{f}(u)] r(u) - [\dot{K}(u) - \dot{D}_{f}(u)] \} \left[\exp \int_{0}^{u} - r(s) ds \right] du$$

= $\tau \left[[D_{f}(u) - K(u)] \exp \int_{0}^{u} - r(s) ds \right]_{0}^{\infty}$
= $\tau [K(0) - D_{f}(0)]$
= $\tau K(0)\varepsilon(0),$ (11.28)

which is a stable value as contended.

Note that the last line of (11.28) is identical with the last line of (11.20). This shows that, with a given tax rate, the S-Base tax raises the same present value of tax revenue as the tax on accounting profits. It, too, can therefore be seen as a non-recurring capital levy imposed on the existing stock of equity at the time of the tax reform.

The S-Base tax also shares the property that the initial stock of equity is the upper limit to the present value of tax revenue. However, as distinct from the Brown tax, the tax rate does not have to be below the initial equity-asset ratio to prevent bankruptcy. Any tax rate below unity preserves a strictly positive market value of shares.

Judged by the maximum present value of tax revenue they can generate without driving firms into bankruptcy, the S-Base tax, the Brown tax, and the tax on accounting profits appear to be equally powerful revenue raisers. With an appropriate bridging policy through variations in the level of public debt, they are able to finance the same time paths of government expenditure. From a practical perspective, the differences in the timing of tax revenues cannot be completely neglected though. Above all, it is an indispensible requirement of an attractive capital income tax that, in the long run, the tax revenue will grow proportionately to the other aggregates in the economy. The Brown tax guarantees this property. The S-Base tax can be expected to have it, as it harmonizes with balanced financial decisions. But the tax on accounting profits drives firms into debt financing and is likely to have a tax base that erodes in relative terms.

11.3.5.5. Market Failure, Cockaigne, and the Revenue of the Cash Flow Taxes

The two preceding sections showed that the conditions for an intertemporal general equilibrium to exist and for the two cash flow taxes to generate a permanent flow of revenue are the same. The cash flow taxes will only generate revenue when the rate of growth of the capital stock falls short of the market rate of interest and an intertemporal general equilibrium with these taxes will only exist when the same condition is satisfied in the long run.

Although the existence condition was derived from a quite special version of an intertemporal general equilibrium model, it is of general significance for an ideal market economy. If the interest rate is permanently below the economy's rate of growth, solutions would not exist for the planning problems of households nor for those of firms. To finance a flow of consumption that continuously grows at a rate above the discount rate, household wealth would have to be $+\infty$, and the market value of a firm whose investments earn the market rate of interest and whose equity stock grows in proportion to the aggregates of the economy, would be $-\infty$ as such a firm requires a permanent net injection of funds that grows at a rate above the interest rate. Moreover, the economy would always be in a dynamically inefficient situation beyond the Golden-Rule point where consumption is permanently lower than it could be, given the technological constraints of the economy. None of these aspects seems compatible with a perfectly functioning market economy.

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It must be admitted, of course, that the economies existing in reality are not perfectly functioning market economies. But does this imply a less optimistic evaluation of the revenue raising ability of the cash flow taxes? In view of the great variety of market failures observable in reality, a fully satisfactory answer to this question cannot, naturally, be given here. However, the reasons for market failure considered in Section 11.1 – the monopoly argument, the crossing of family lines, and the imperfect intertemporal guarantee of property rights – all negate the question. They suggest that, measured against the Pareto optimal path which satisfies the Modified Golden Rule $(\lim_{t\to\infty} \varphi' - \delta = \rho + \eta g)$, the steady-state capital intensity of a laissez-faire economy is too small and the rate of interest is too high:

$$\lim_{t \to \infty} r(t) = \lim_{t \to \infty} \varphi'[k(t)] - \delta > \rho + \eta g > n + g = \lim_{t \to \infty} \hat{K}(t).$$
(11.29)

In connection with (11.21) and (11.27), this obviously ensures the revenue raising ability of the two cash flow taxes for an even stronger reason.

If, contrary to these considerations, the economy is nevertheless able to grow permanently at a rate above the market rate of interest - whatever the reason may be - then the two cash flow taxes would not be suitable means for funding public expenditure. But they would not suffer this lot alone. In a certain sense, the same lot would befall all taxes, for the ideal instrument for raising funds for public expenditure would be debt financing. On the one hand, there is the possibility that the results of the overlapping-generations literature apply¹⁷ and that an increase in the public debt will slow down economic growth and remove part of the dynamic inefficiency of the economy. On the other hand, even with excessive debt financing, the government would be safe from becoming bankrupt if the situation $\hat{K} > r$ continues.¹⁸ For example, it is possible for the government to keep on borrowing to finance public expenditure proportional to the economy's capital stock and, in addition, to finance principal and interest on the existing debt through further borrowing without driving the stock of this debt beyond all limits in relative terms.

The wonderful mechanisms at work in this land of Cockaigne can easily be spelled out. Let $\alpha > 0$ and $D_g \ge 0$ be the ratio of debt-financed public expenditure to the economy's total stock of capital and the stock of government debt, respectively, and call $d_g \equiv D_g/K$ the public debt ratio. Then the policy described of financing even the interest on the existing debt

¹⁷Cf. Chapters 2.7 and 9.7.

¹⁸See Mückl (1981) and Schlieper (1984) for an extensive discussion of this problem.

through borrowing means that

$$\dot{D}_{g} = \alpha K + r D_{g}$$

or

$$\hat{D}_{g} = (\alpha/d_{g}) + r. \tag{11.30}$$

Calculating the time derivative of the public debt ratio,

$$\dot{d}_{\rm g} = \frac{\dot{D}_{\rm g}K - \dot{K}D_{\rm g}}{K^2} = (\hat{D}_{\rm g} - \hat{K})d_{\rm g},\tag{11.31}$$

and substituting for \hat{D}_{g} from (11.30) gives

$$\hat{d}_{g} = \alpha - (\hat{K} - r)d_{g}.$$
 (11.32)

In the case under consideration, $\hat{K} > r$. Thus, (11.32) implies that the time path of the public debt ratio does not "explode", but approaches a strictly positive constant when the real part of the economy converges to a steady state:

$$\lim_{t \to \infty} d_{g}(t) = \frac{\alpha}{\lim_{t \to \infty} \left[\hat{K}(t) - r(t) \right]} = \text{constant.}$$
(11.33)

Obviously, government debt is no problem in Cockaigne, and the problem of minimizing the excess burden of taxation does not exist.

Anyone who thinks that these implications of the case $\hat{K} > r$ are not realistic, who doubts that the government lives in Cockaigne, and who believes that the problem of optimal taxation is a problem, can hardly escape the conclusion that conditions do apply in the economy that are necessary for the existence of an intertemporal general equilibrium and ensure that the cash flow taxes are powerful revenue raisers.

11.3.6. The Problems of Intersectoral and International Neutrality

Because of the property of investment neutrality – that is, the absence of a wedge between the marginal product of capital and the market rate of interest – an intersectoral neutrality is obviously ensured for all four candidates. Even when different tax rates apply to different sectors, an efficient allocation of a nation's capital stock to alternative domestic uses can be expected.

Things are hardly different with regard to the international structure of capital. With perfect capital markets, interest rates are equalized internationally and, together with the property of investment neutrality, this ensures an efficient allocation of the world capital stock to the different countries. As there are no interest income taxes, this advantage is supplemented by the equalization of subjective rates of time preference across borders.

When combined with the residence principle for taxing interest income, perfect Schanz-Haig Simons systems, too, may result in an efficient international allocation of capital. As shown in Chapter 7, such an optimistic outcome can be expected in the case of full financial flexibility. Under ideal circumstances, it would therefore be admissible that only some countries switch from a Schanz-Haig-Simons system to one of the reform systems (a)-(d) without inducing a process of restructuring the world capital stock. The only reason for allocative changes would be that the inhabitants of the reforming countries enjoy a higher net market rate of interest in the short run. This results in higher savings and a faster growth of the world capital stock than otherwise would have occured. Since the equality of the marginal products of capital is maintained for all points in time, even the nonreforming countries will benefit from this growth through gradual capital imports from the reforming countries, but the reform would not induce sudden stock adjustments that could disturb the frictionless operation of the world economy.

11.3.7. The Provisional Winners: Practicable, but Radical

At this stage of the discussion, only the Brown tax and the S-Base tax seem attractive. The two profit taxes (a) and (b) have been disqualified because of their inability to maintain a strictly positive and constant tax-output ratio (a, b) or because of their lack of financial neutrality (b).

This result is confirmed if practicability considerations are taken into account. The two profit taxes perform very badly in this respect. Like the Schanz-Haig-Simons systems, they require true economic depreciation for marginal investment projects, but it is virtually impossible to design a simple monitoring system that would enable the tax authorities to implement this depreciation method in practice. The Brown tax and the S-Base tax are free from similar problems as they avoid all evaluation difficulties. Only directly observable payment flows enter the definition of the tax base. Both of these taxes therefore appear as attractive candidates for a reformed system of capital income taxation, and it is quite understandable that Kay and King and the Meade Committee advocated them for Britain.

There is only one problem, though: the taxes involve quite radical

reforms of the present tax system and they cannot be implemented without a great upheaval. Consider what they really mean. No differentiation between the taxation of retained and distributed profits, no deductibility of debt interest, and no taxation of interest income with Kay and King's proposal! No taxation of retained profits and no taxation of personal interest income with the Meade Committee's proposal! These aspects are a very long way from existing tax laws, and, unfortunately, it seems that they significantly reduce the chances of the cash flow taxes being implemented in the foreseeable future.

The decisive weakness of the proposals is the missing ability to include the taxation of personal interest income, a problem that was discussed in Sections 5.3.5 and 5.3.6. A reform that leaves the rentier's returns untaxed cannot be made palatable to any of the world's parliaments.

11.4. An Alternative Proposal

... we hoped that the Committee would adopt a practical approach: to aim at those reforms which would be able to command the widest possible support in the hope that political argument might in future be concerned with rates of tax rather than the structure; and also to bear in mind the need to avoid radical upheavals in the system.

These are the words with which the director of the Institute of Fiscal Studies, Dick Taverne, introduced the report of the Meade Committee on the reform of direct taxation.¹⁹ They are not supplemented by comments that imply that the Committee was successful in achieving these ends.²⁰ In view of the care with which the Committee analyzed the transition problems in particular this reserve seems unjustified. The Meade Committee did do a marvellous job, and the way this report combined brilliant theoretical ideas with thorough practical considerations is truely unique. The quotation shows, however, how narrow the spectrum of politically feasible tax reforms really is and it suggests that it may be useful to investigate other reform possibilities that are less radical. One such possibility will be discussed in the following sections. It is related to a tax that the Meade Committee (1978) presented as a particular way of implementing a general consumption tax. According to the Committee, a consumption tax of this kind would be an appropriate supplement to the Brown tax (R-Base tax), while a consumption tax in its usual form would fit the S-Base tax best.

¹⁹Meade Committee (1978, preface).

²⁰Instead it says in the preface, although not only with regard to this end: "We recognized that what we asked of the Committee was in many ways an impossible task ...".

The latter combination of taxes is advocated by the Committee.²¹. The proposal discussed in the next few pages is meant to replace all other forms of capital income taxation and to supplement a wage tax.

11.4.1. A Simple Means of Achieving Growth Neutrality

It is a necessary prerequisite of growth neutrality that the marginal product of capital equals the rate of time preference. The above reform proposals produce this equality by joining the marginal product of capital with the rate of time preference at the level of the market rate of interest. The disadvantage of doing this is that it necessarily requires the removal of personal interest taxation. Another means of achieving growth neutrality, compatible with interest income taxation, might also be tried.

The analysis in Chapter 9 has shown that accelerated depreciation counteracts the retardation of economic growth that Schanz-Haig-Simons systems are likely to bring about. It is true that interest income taxation drives a wedge between the market rate of interest and the consumer rate of time preference. However, accelerated depreciation allowances are able to compensate for this wedge by pushing the marginal product of capital below the market rate of interest, and this effect is stronger the more generous the allowances are and the higher the corporate tax rate on retained profits. It is quite obvious, then, that an attempt could be made to produce growth neutrality by an appropriate choice of the tax rate on retained profits and of the tax depreciation rules without abolishing existing taxes.

A priori there are many combinations of depreciation rules and tax rates conceivable that would remove the wedge between the marginal product of capital and the rate of time preference. However, under the aspect of practicability, only an immediate write-off seems attractive. All existing tax systems suffer from the fact that it is impossible to embody the idea of true economic depreciation in a simple and practical formula usable by firms and controllable by the tax authorities. An awful mess of tax depreciation rules and unintended allocation effects are usual. It thus makes little sense to base the reform proposal once again on special depreciation requirements that have no chance of becoming implemented in practice. Immediate write-off is a depreciation rule that *can* be implemented! It is a requirement that avoids most of the evaluation problems presently associated with the

²¹Cf. especially pp. 254n.

calculation of taxable profit. The purchasing price of an asset can be immediately deducted in the year of purchase, and all speculation about the expected life or the development of the market price is superfluous.

For this reason, an immediate write-off ($\alpha_1 = 1$) will be assumed as the starting point, and, using the growth model of Chapter 8, a tax rate structure that fits this assumption is looked for. From (8.45) and (8.46), the equation of motion for consumption per efficiency unit of labor and the corresponding steady-state equation are

$$\dot{c} = \frac{c}{\eta} \left[\frac{\varphi'(k) - \delta}{\tilde{P}_{\kappa}} - (\rho + \eta g) \right]$$
(11.34)

and

$$\varphi'(k^{\infty}) - \delta = (\rho + \eta g) P_K + \tau_k. \tag{11.35}$$

If, in accordance with international practice, it is assumed that firms can deduct debt interest and if, moreover, different marginal tax rates for distributed profits, retained profits, capital gains, and personal interest income are allowed (τ_d , τ_r , τ_c , $\tau_p \ge 0$), then the wedge parameter \tilde{P}_K that appears in these equations becomes

$$\tilde{P}_{K} = \frac{\theta_{r} - \sigma^{*}}{\max(\theta_{d}^{*}, \theta_{r}^{*})} + \frac{\sigma^{*}}{\theta_{p}}.$$
(11.36)

It is assumed here that there are no taxes on the stock of capital ($\tau_k = 0$). Whether or not there is a value-added tax can be left open as this tax does not interfere with Conditions (11.34)-(11.36).

As the tax parameters do not disappear from (11.36), it follows, small wonder, that immediate write-off is not sufficient for growth neutrality. However, if it is assumed that retained profits are taxed at the same rate as personal interest income, that distributed profits are taxed at least at this rate, and that capital gains are not taxed at all²² ($\tau_r = \tau_p \equiv \tau > 0$, $\tau_d \ge 0$, $\tau_c = 0$), then $\tilde{O}_K = 1$ and (11.34) and (11.35) reduce to the familiar laissezfaire conditions known from (2.48) and (2.52):

$$\dot{c} = \frac{c}{n} [\varphi'(k) - \delta - (\rho + \eta g)], \tag{11.37}$$

$$\varphi'(k^{\infty}) - \delta = \rho + \eta g. \tag{11.38}$$

The reason for this neutrality result is that, when $\theta_r^* = \theta_p \equiv \theta$ and $\theta_c = 1$,

²²Note that these assumptions ensure that the uniqueness condition (8.56) is satisfied.

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(8.39) reduces to

$$p' - \delta = \theta r \tag{11.39}$$

while Equation (8.44) retains its usual form with

$$\gamma = \theta r. \tag{11.40}$$

Obviously, these two equations indeed ensure that the marginal product of capital equals the rate of time preference:

$$\varphi' - \delta = \gamma. \tag{11.41}$$

This shows that comparatively modest reforms would suffice to make the existing systems of capital income taxation growth neutral. It is not necessary, as with the S-Base tax, to abolish taxation of retained profits and personal interest income. Neither is it necessary, as with the Brown tax, to equalize the tax rates for retained and distributed profits, to abolish personal interest income tax, and to cancel deductibility of debt interest. It is sufficient for growth neutrality if, starting from the existing systems, the tax rates for retained profits and personal interest income tax, and personal interest income are equalized and immediate write-off of investment projects is allowed.

Figure 11.1 illustrates the growth path that would result from replacing one of the present systems of capital income taxation with the alternative described, where it is assumed that the economy was in a steady state before



Figure 11.1. The growth path of the economy after a reform of capital income taxation.

the reform. The essential aspect of the adjustment path to a new steady state is the sudden drop in consumption which is then compensated by a gradual rise towards a growth path above the one that otherwise would have been taken.

Worth noting, but, at this stage of the analysis, not surprising, is the fact that the tax on distributed profits is irrelevant for the result. Provided the financial existence requirement $\tau_d \ge 0$ (and hence $\theta_d^* \le \theta_p$) is satisfied,²³ the property of growth neutrality holds independently of the corporate tax rate on dividends. Even a full double taxation of dividends with corporate and personal taxes is admissible. Thus, there is no point in joining the old debate between "lawyers" and "economists" of whether a corporation is a taxable entity in itself or merely an extension of the shareholders and whether "accordingly" double taxation of corporate dividends is appropriate or not. Both views are compatible with the reform proposal described.

11.4.2. No Incidence on Wage Earners

Like the reformed systems studied above, the alternative system just described would not impose a tax burden on workers. On the one hand, the system does not drive a wedge between the marginal product of labor [cf. (3.37)] and the wage rate. On the other hand, it does not retard capital formation and thus cannot decrease the wage rate via a change in the marginal product of labor itself.

From the point of view of wage earners, this is a significant advantage compared to the existing systems of capital income taxation which all have in common that they shift a significant part, if not most, of the tax burden to wage earners. If, starting from a distorted steady state under one of the existing systems, a reform in the proposed direction were carried out, then the real wage rate would increase towards a higher steady-state path just as it would after replacing the existing system with a lump sum tax.

A further implication of the non-shiftability of the tax is, as mentioned, the fact that in more complex models with an elastic labor supply there would be no distortion in the labor-leisure choice. A formal proof of the property of "employment neutrality" in an intertemporal general equilibrium model with elastic labor supply was given elsewhere.²⁴

²³Cf. Chapter 4.2.3.

 $^{^{24}}$ Sinn (1984a). This paper also addresses the inflation problem not treated here and shows that all cash flow taxes share the property of "inflation neutrality" in the sense that the economy becomes invulnerable to inflation even when no indexing is introduced.

11.4.3. Partial or Perfect Financial Neutrality: Three Variants of the Proposal

It was already stated in Chapter 4 that, in order to avoid excessive debt financing on the one hand and permanent profit retentions on the other, it is necessary to equate the marginal tax burden on retained profits (τ_r) with that on personal interest income (τ_p) when there is no capital gains tax and debt interest is deductible. The very same condition turned out to imply growth neutrality in the case of an immediate write-off. Thus the goals of financial neutrality, of practicability of depreciation rules, and of growth neutrality harmonize perfectly.

Note, however, that by equalizing τ_r and τ_p financial neutrality will only be reached with regard to debt and profit retentions, two of three possible ways of financing. Whether there will also be an indifference with regard to new share issues depends on other aspects of the tax system. Three alternative variants of the system can be distinguished.

Variant A

The first variant subjects distributed profits to personal and corporate taxation ($\tau_d > \tau_c = 0$, $\theta_d^* < \theta_r^* = \theta_p$) and, like the existing systems, it is characterized by the proscription of negative dividend payments ($\Pi^d \ge 0$).²⁵ These properties imply that there is merely partial financial neutrality, for funds newly injected into the firm are discriminated against relative to retentions and debt. In Figure 4.2 from Chapter 4 the variant is represented by the financial preference of Type 4 where all borderlines depicted are valid.

The discrimination against equity capital that comes from outside the firm is a characteristic of most existing systems of capital income taxation as dividends are always subjected to personal income tax and typically, at least in part, subjected to corporate tax, too. As this discrimination is not a discrimination against the formation of equity capital as such, as it does not affect the firm's cost of capital under mild theoretical conditions, and as it concerns a financial instrument that is rarely chosen in reality, it should not be given too much attention. Even without a reduction or removal of double taxation of corporate dividends, essential goals of a reform can be realized. However, if a strict equivalence between all three financial instruments is nevertheless wanted, then the two following possibilities seem appropriate.

²⁵ Cf. Equation (4.4).

Variant B

Dividends are subject to personal, but not to corporate taxation so that the same overall marginal tax rate applies to dividends, retained profits, and personal interest income ($\tau_d = \tau_e = 0, 0_d^* = \theta_r^* = \theta_p$). Obviously, this is the Teilhabersteuer supplemented by an immediate write-off.²⁶ The financial preferences are now represented by Type 5, Figure 4.2, and indeed all three financial instruments are equivalent from a tax perspective.

Variant C.

The corporate tax on dividends is maintained $(\tau_d > \tau_c = 0, \theta_d^* = \theta_r^* = \theta_p)$, but the dividend tax applies to dividends net of new share issues. This includes the case where net dividends are negative and the government pays money to the firm.²⁷ The idea of a silent partnership that underlies the Brown tax and the S-Base tax is pushed as far as possible without paying the price of abolishing a tax. Formally, this variant can be represented by removing Constraint (4.4) which requires non-negative dividends. The financial preferences are still represented by Type 4, Figure 4.2, but, as the lower constraint to the solution space does not apply,²⁸ there is, in fact, an equivalence between all three financial instruments.

The equality of the tax rates on retained profits and personal capital income combined with a potential double taxation of dividends is reminiscent of the properties of a Miller equilibrium (see Chapter 4.3.4), and, in fact, crucial aspects of this equilibrium, including its financial neutrality properties, are captured by all three variants. The differences are rather subtle. Unlike the Miller equilibrium, the reform proposal excludes a capital gains tax because the investment disincentive this tax brings about does not vanish under accelerated depreciation. And, while the Miller equilibrium requires a sufficiently (and perhaps implausibly) progressive personal income tax schedule, the reform proposal is based on the assumption of appropriately chosen flat tax rates. Nevertheless, it would be justifiable to describe the proposal as an enforced Miller equilibrium combined with an immediate write-off of real investment projects.

²⁸Note that this possibility was already assumed with Constraint (4.4) and was carried through to the intertemporal general equilibrium model.

²⁶Cf. Chapter 3.1.2.

²⁷The tax then operates as a subsidy at the rate $(1/\theta_d)$ -1 on the funds contributed by shareholders.

11.4.4. The Criterion of Acquisition Neutrality

As the system under consideration is characterized by deductibility of debt interest ($\alpha_2 = \alpha_3 = 0$) and taxation of interest income ($\tau_p > 0$), it is the special case of a general tax system, for which the problem of acquisition neutrality was discussed in Chapter 6.1.

It therefore follows for the market value of the firm from (6.4) and (6.5) that

$$M = \theta_{\rm d} (K\theta - D_{\rm f}), \quad \theta \equiv \theta_{\rm r} = \theta_{\rm p}, \tag{11.42}$$

and, according to (6.16), the wealth increase the shareholders of firm A enjoy when this firm buys the shares of firm B at the stock market price M^{B} is:

$$\tilde{M}^{A} - M^{A} = \tau_{d} M^{B}. \tag{11.43}$$

Thus, only Variant B, where there is no corporate tax on dividends, ensures the property of acquisition neutrality. With Variants A and C, the shareholders of the acquiring firm enjoy a wealth increase just as with the double taxation systems currently existing in most OECD countries.

To avoid the concentration tendency that Variants B and C imply, two measures are available. As shown with (6.18) and (6.19), one of the measures is to abolish the affiliation privilege for the dividends paid out by the acquired company. Another measure is to introduce an acquisition tax on the value of the shares purchased. According to (6.23), the size of the tax rate ensuring acquisition neutrality is

$$\tau_{\rm M} = \tau_{\rm d}/\theta_{\rm d}.\tag{11.44}$$

11.4.5. Tax Revenue

Two of the four "radical" candidates for an allocatively neutral form of capital income taxation were eliminated from the competition because of their inability to generate an increasing flow of revenue. One did not generate any revenue at all and the other implied a permanently shrinking tax-output ratio. The question is therefore what revenue flow can be expected from the fifth candidate.

With this candidate there are three components of capital income taxation. The first is the personal tax on interest income from (3.7):

$$T_{\rm i} = \tau r D_{\rm f}.\tag{11.45}$$

The second component is the tax on retained profits. It follows from Equation (3.18) for $\tau \equiv \tau_r = \tau_p$, $\tau_k = \alpha_2 = \alpha_3 = 0$, and $\alpha_1 = 1$ that $T_r = \tau [f(K,L) - \delta K - wL - I - rD_f - \Pi^d]$. If Π^d is replaced according to (3.25) and (3.26), then this expression simplifies to²⁹

$$T_{\rm r} = -S_{\rm f} \tau/\theta \tag{11.46}$$

Thus there will be tax revenue only when the firm retains profits for the purposes of redeeming its debt or investing in the capital market. Profit retentions for the purpose of real investment are tax-exempt as the tax system is characterized by immediate write-off.

The third component is the sum of the personal and corporate taxes on distributed profits. From (3.9), (3.25), and (3.26) it follows that³⁰

$$T_{d}^{*} = \tau_{d}^{*} [f(K, L) - \delta K - wL - rD_{f} - I + S_{f} - T_{r}], \qquad (11.47)$$

where $\tau_d^* [\equiv 1 - \theta_d^* = 1 - (1 - \tau)(1 - \tau_d) = \tau_d + \tau - \tau \tau_d]$ is the combined tax rate on dividends.

The sum of the three components is the total tax revenue raised. Using (11.16), the following expression for this sum can be derived:

$$T = T_{i} + T_{r} + T_{d}^{*}$$

= $(\varphi' - \delta)(K\tau_{d}^{*} - D_{f}\tau_{d}) - (I\tau_{d}^{*} - S_{f}\tau_{d}).$ (11.48)

To interpret this condition it is useful to consider first two special cases.

If it is assumed that $(\tau_r = \tau_p \equiv)\tau = 0$ and hence $\tau_d^* = \tau_d$, the reform proposal reduces to that of the Meade Committee. Equation (11.48) becomes

$$T = \tau_{\rm d} [(\varphi' - \delta)(K - D_{\rm f}) - (I - S_{\rm f})],$$

which is obviously the same as (11.26). On the other hand, if $\tau_d = 0$ and hence $\tau_d^* = \tau (\equiv \tau_r = \tau_p)$, (11.48) reduces to

$$T = \tau[(\varphi' - \delta)K - I],$$

which is the same as Equation (11.21) that was shown to characterize the Brown tax advocated by Kay and King. This congruence is noteworthy as the fifth candidate is not identical with the Brown tax even in the special case $\tau_d = 0$. Unlike this candidate, dividends are not subjected to personal taxation with the Brown tax, but they are taxed as profits ($\tau_d^* = \tau_r, \tau_p = 0$); and while firms are not allowed to deduct debt interest, personal interest

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³⁰Cf. Footnote 29.

²⁹The calculation assumes Q = 0 as it was shown that new share issues can only occur if the tax law treats them as negative dividends.

income is not taxed. Obviously these differences are irrelevant under the aspect of revenue raising.

As $\tau_d \ge 0$, the shape of the time path of tax revenue will in general, as with the S-Base tax, depend on the firms' financial decisions. However, if, in line with the financial neutrality properties of the proposal, it is again assumed that the debt-asset ratio σ is a constant, then $\sigma = S_f/I = D_f/K$ and (11.48) becomes

$$T = \tau_{\rm d}^* K(\varphi' - \delta - \hat{K}) \left[1 - \sigma \frac{\tau_{\rm d}}{\tau_{\rm d}^*} \right], \quad \sigma = \text{constant.}$$
(11.49)

As mentioned in the context of the Brown tax, the fundamental existence condition (8.49) ensures that $\varphi' - \delta - \hat{K} = \text{constant} > 0$ in the steady state. Thus, a permanent flow of tax revenue that grows in proportion to the capital stock and to national product can be expected if the second bracket in (11.49) is strictly positive. As $\sigma(0) < 1$ follows from (11.42) and from the assumption of a strictly positive market value [M(0) > 0] and as $\tau_d \le \tau_d^*$, this condition is clearly satisfied. The economic problems behind the existence condition (8.49) were discussed in Section 11.3.5.5 in the context of the Brown tax and the S-Base tax, and it is not necessary to repeat that discussion here. If the (gross) market rate of interest r is replaced with the market rate of interest net of the personal tax $r\theta$ – because the latter now equals both the rate of time preference and the marginal product of capital and, in addition, measures the net cost of government finance - then all previous findings stay valid. In particular, it is still true that well functioning markets and/or the impossibility of financing government expenditure with an excessive debt policy guarantee the ability to raise revenue.

Because of the financial neutrality of the system, the present value of tax revenue is again insensitive to changes in the firms' financial decisions and can be calculated without assuming a constant debt-equity ratio. By definition, it holds that $\dot{K} = I$ and $\dot{D}_{f} = S_{f}$. Thus, assuming the integrability conditions

$$\lim_{t \to \infty} \left(X(t) \left[\exp \int_0^t - r(s) ds \right] \right) = 0 \quad \text{for } X = K, \ D_f,$$

it follows from (11.48) and (11.39) that the present value of tax revenue is given by

$$B_{\mathrm{T}}(0) = \int_0^\infty \{ [K(u)\tau_{\mathrm{d}}^* - D_{\mathrm{f}}(u)\tau_{\mathrm{d}}] \theta r(u)$$

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$$-\left[\dot{K}(u)\tau_{d}^{*}-\dot{D}_{f}(u)\tau_{d}\right]\left\{\left[\exp\int_{0}^{u}-\theta r(s)ds\right]du\right.$$
$$=\left[\left[D_{f}(u)\tau_{d}-K(u)\tau_{d}^{*}\right]\exp\int_{0}^{u}-\theta r(s)ds\right]_{0}^{\infty}$$
$$=\tau_{d}^{*}K(0)-\tau_{d}D_{f}(0)$$
$$=\tau_{d}^{*}K(0)\left[1-\sigma(0)\frac{\tau_{d}}{\tau_{d}^{*}}\right].$$
(11.50)

Once again it turns out that the tax system is comparable to a nonrecurring capital levy imposed at the time of the tax reform. In the special case $\tau_d = 0$, the base of this levy is the capital stock as with the Brown tax, and, in the special case $\tau_d = \tau_d^*$, it is the stock of equity as with the S-Base tax. In general, the base of the capital levy has a magnitude between the total stock of capital and the stock of equity capital.

After a number of empirical calculations on the revenue raising ability of alternative tax systems, the Meade Committee (1978, p. 245) concluded that the S-Base tax "... would raise no less and perhaps more revenue than the corporate tax systems which we (i.e., the U.K.; the author) have had in the past ...". If this conclusion is correct, it must a fortiori be true for the tax system considered here. As the tax base is broader than that of the S-Base tax, it is somewhat easier for this system to raise revenue. The last two lines of (11.50) show this. Regardless of whether we hold the corporate tax rate on dividends (τ_d), or the combined tax rate on dividends (τ_d^*), constant and identify it with the tax rate applied to the "S-Base": since the taxation of personal capital incomes and retained profits implies that $\tau_d^* > \tau_d$, it is obvious that, when the sector of firms is in a net debtor position [$\sigma(0) > 0$], the revenue will be higher than in the case $\tau_d^* = \tau_d$ which characterizes the S-Base tax.

This statement must be qualified in so far as the initial market value of the firm (without taxes) is again the upper limit of the present value of tax revenue. In this respect, all reform proposals are alike. The market value function (11.42) shows that this limit constrains the tax rate τ that is applied to personal capital incomes and to retained profits to values below the initial equity-asset ratio just as it constrained the Brown tax rate to such values [cf. (11.25)]:

$$\tau < \varepsilon(0). \tag{11.51}$$

The dividend tax rate, on the other hand, can have any value below unity without resulting in a negative post-tax market value of the firm.

11.4.6. Taxation and Sectoral Structure

If the tax reform is confined to the sector of corporate firms or the sector of non-corporate firms alone, distortions in the production structure are unavoidable. Let X be the sector taxed according to the traditional Schanz-Haig-Simons rules and Y the sector to which the reform system is applied. Then, according to (5.35), Sector X employs capital up to the point where

$$\left(\frac{\partial f}{\partial K^X}\right) - \delta = r \tag{11.51}$$

and, according to (11.39), Sector Y follows the rule

$$(\partial f/\partial K^{\gamma}) - \delta = \theta^{\gamma} r, \tag{11.52}$$

where θ^{γ} is one minus the tax rate which in Sector Y is applied to retained profits and to all capital incomes earned by the shareholders of the firms operating in this sector. The two equations together imply that the capital market equilibrium is characterized by an excess of the marginal product of capital in Sector X over that in Sector Y:

$$\left(\frac{\partial f}{\partial K^{\chi}} - \delta\right)\theta^{\gamma} = \frac{\partial f}{\partial K^{\gamma}} - \delta.$$
(11.53)

Too much capital will be allocated to the sector that employs the reformed system, and welfare losses of the Harberger type can be expected.

To avoid this consequence, it is necessary that both sectors are subjected to the new system. Note, however, that using the same system is merely a necessary, and not a sufficient, condition for efficiency. If two different tax factors θ^{X} and θ^{Y} are applied to the two sectors, then the capital market equilibrium is characterized by

$$\left(\frac{\partial f}{\partial K^{X}} - \delta\right)\theta^{Y} = \left(\frac{\partial f}{\partial K^{Y}} - \delta\right)\theta^{X},\tag{11.54}$$

and it turns out that too much capital will be employed in the sector with the higher tax rate. Obviously, intersectoral neutrality of taxation under the reformed system requires applying the same tax rates in the two sectors.

Part of the traditional discussion about the differences in the taxation of corporate and non-corporate firms was concerned with the question of whether corporate firms should pay for the privileges of their legal status through higher taxes, and some economists have tended to give an affirmative answer. If a higher tax burden on corporations is to be installed under the reformed system, this cannot be done through taxing the retained profits of corporations more heavily than those of non-corporate firms

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because this would create the distortions demonstrated by (11.54). An appropriate way of imposing a higher tax burden on corporations is to subject their dividends to a double taxation with corporate and personal tax as under the classical or partial imputation systems. This form of differentiating between the corporate and non-corporate sectors does not distort the intersectoral allocation of capital and would be adequate for a frictionless market economy, provided differentiation is wanted at all.

11.4.7. International Aspects: Possibilities for a Piecemeal Reform

If, as presently, the residence principle applies to the taxation of bordercrossing interest income flows,³¹ then the international allocation problems connected with a tax reform are similar to the intersectoral problems. Clearly the reform would only be compatible with an efficient international structure of world capital stock if it were carried out simultaneously in all countries and if, moreover, the same tax rates on retained profits and personal interest income were applied everywhere. Such a harmonization of tax rates is a requirement that has no chance of ever being met in reality, even if the reform were carried out in all countries. The question is therefore whether a system of international capital income taxation can be designed that supplements the reformed national systems and works despite international tax-rate differences. Moreover, it would be useful to know whether a single country by itself could introduce the reformed system without inducing a process of restructuring the world capital stock. These problems will now be considered.

Suppose there are two countries, X and Y, that exchange goods and capital. In some initial situation, the two countries both employ Schanz-Haig-Simons systems with true economic depreciation. Assume that firms can freely choose their financial instruments. There is no tax on the capital stock and the residence principle applies to the taxation of interest incomes. Under these circumstances, the neutrality result of Chapter 7.2.3 holds in the situation before the reform:

$$(\partial f/\partial K^{X}) - \delta = (\partial f/\partial K^{Y}) - \delta.$$
(11.55)

What possibilities does Country Y have for introducing the reform system without disturbing this condition?

³¹If there is a value-added tax, it is assumed that the destination principle is applied to international trade flows. Cf. Footnote 2, Chapter 7.

Consider first the possibilities that arise if international capital movements are limited to trade in financial assets, that is, if there is no direct investment. Assume also, for the time being, that all firms operating in a country are owned and controlled by this country's residents. After the reform, the firms in Country X will, as before, invest up to the point where the marginal product of capital equals the domestic gross market rate of interest:

$$(\partial f/\partial K^{X}) - \delta = r^{X}.$$
(11.56)

However, according to (11.39), the firms in Country Y invest up to the point where the marginal product of capital equals the domestic net market rate of interest:

$$(\partial f/\partial K^{\gamma}) - \delta = r^{\gamma} \theta^{\gamma}. \tag{11.57}$$

Here, θ^{γ} is the tax factor that Country Y applies to retained profits and personal capital income. Obviously, (11.56) and (11,57) will not imply (11.55) if both countries employ the residence principle and interest arbitrage equalizes the interest rates of the two countries. A modification of the taxation of international interest income flows is therefore necessary.

A general abolition of the residence principle for both countries would not be a solution though, since this would equate the net rates of interest of the two countries³² and hence reduce the marginal product of capital in the reforming country below that in the non-reforming country. Instead, a feasible way would be to introduce the source principle unilaterally in the reforming country. Suppose this country taxes interest payments to foreigners at the domestic rate τ^{Y} and exempts interest income domestic residents earn abroad from domestic taxation. In this case, a domestic investor has to compare the net rate of return r^{X} on foreign assets with the net rate of return $r^{Y}\theta^{Y}$ on domestic assets, and he is indifferent between these assets, if

$$r^{\chi} = \theta^{\gamma} r^{\gamma}. \tag{11.58}$$

A foreign investor, on the other hand, compares the net rate of return $\theta^{X}r^{X}$ from assets in his country with the net rate of return $\theta^{X}\theta^{Y}r^{Y}$ from assets in the reforming country. Obviously, he, too, is indifferent if (11.58) holds. This equation therefore characterizes the capital market equilibrium if Country X employs the residence, and Country Y the source, principle. Together with (11.56) and (11.57), the capital market equilibrium implies (11.55), as

³²Cf. Equation (7.4).

was wanted. Thus, when combined with a transition to the source principle, a unilateral reform of capital income taxation along the lines described is possible without inducing international reallocation of the existing stock of capital.

It may be useful to confront this result with the American tax reform of 1981, in particular the introduction of the Accelerated Cost Recovery System. As reported earlier,³³ according to the calculations of the Department of the Treasury, this reform increased the joint incentive effect from accelerated depreciation and other investment allowances to a level that for many assets was equivalent to, or even higher than, immediate write-off.³⁴ Suppose the mechanism underlying the Miller equilibrium was operative in the United States and tended to equalize the marginal personal tax rate of the representative shareholder with the corporate tax rate, then the tax reform of 1981 can be seen as a reform that introduced the theoretical system of Variant A into the United States.

There is one important difference though. The United States did not introduce the source principle for interest taxation, but maintained the residence principle. This neglect is one of the reasons why the reform was non-neutral with regard to international capital movements. The reform dramatically reduced the profitability requirement for American investment below the profitability requirement for capital invested abroad, boosted the interest rates in most countries, and sucked in capital from all over the world.^{35,36} A unilateral introduction of the source principle would have discriminated against American financial assets relative to foreign ones and would have counteracted this effect. The world economy would then, very likely, have been spared the troubles it has been through in the last few years.

Equations (11.56)-(11.58) were derived under the assumption that international capital movements take place exclusively by trading financial assets. Consider now the problem of direct investment. The basic difficulty with direct investment is that the tax rates relevant for a firm's decisions are, at present, determined by both the home and the host countries. The host country of a subsidiary determines the tax rate on retained profits, but the home country fixes the personal income tax rate of the subsidiary's

³³Cf. Chapter 7.4.

³⁴U.S. Department of the Treasury (1984, pp. 105 n; 1985, p. 135).

³⁵Cf. the last section of Chapter 7 for an extensive discussion of these effects.

³⁶By the end of 1986, the accumulated capital import into the United States since the introduction of ACRS in 1981 will be about \$400 billion. This is 40% of the long-run volume of capital import that was predicted to result from ACRS in Sinn (1984b).

representative shareholder. Suppose the host country (X) is unwilling to give up its tax authority and the home country (Y) wants to carry out the tax reform. Then, the simplest way of overcoming the difficulty seems to be to adjust the taxation of the subsidiary to the tax rules that apply in the home country. For example, this country could rebate the host-country taxes which the subsidiary paid and, in exchange, tax the subsidiary as if it were located at home.³⁷ Analogously, a foreign subsidiary located in the domestic country, would have to be taxed according to the rules that would apply to this subsidiary if it were located abroad. The first type of firm would then express its capital demand according to (11.57), and the second type according to (11.56), and again (11.58) would ensure an efficient international structure of capital.

Big efforts have been made in previous years to construct a complex edifice of international double taxation agreements that refer primarily to repatriated earnings. If all these agreements had to be rewritten when a country wanted to reform its system of capital income taxation, high administrative costs that drastically reduce the net advantage of the reform would have to be reckoned with. Fortunately, however, the problem is far less troublesome than it might appear at first sight. For the reasons spelled out in Chapter 7 (in particular, the fundamental neutrality properties of dividend taxation) the taxation of repatriated earnings is fairly neutral. Thus, it does not matter greatly what, in detail, the double taxation agreements look like. These agreements could be retained when a country introduces a reform and no compensating measures to adjust the effective tax burden on repatriated earnings to the rules in the shareholders' residence countries would be necessary.38 Basically it suffices to limit the compensatory measures to the taxation of retained profits and to unilaterally introduce the source principle for the taxation of interest incomes.

If more than one country stops employing the traditional Schanz-Haig-Simons tax, there will be no additional problems. The reforming countries can, one by one, switch to the source principle for interest incomes and tax the multinational corporations according to the rules described, without

³⁸In order to avoid the existence problems discussed in Chapter 4.2.3 it is necessary, however, to prevent the overall tax rates on dividends from falling below the respective tax rates on personal interest income.

³⁷This includes the possibility of immediate write-off and the source tax on interest paid out to creditors. Analogously, interest paid by a foreign subsidiary operating in the domestic country should be exempt from the source tax, and this subsidiary should be denied the possibility of immediate write-off.

causing an international reallocation of capital. Suppose, in the two-country case considered above, Country X joins Country Y in reforming its tax system. Then it generates a capital market equilibrium that is characterized by

$$\theta^{X} r^{X} = \theta^{Y} r^{Y} \tag{11.59}$$

rather than by (11.58).³⁹ As (foreign and domestic) firms that are controlled by shareholders living in Country X invest according to the rule

$$(\partial f/\partial K^X) - \delta = \theta^X r^X \tag{11.60}$$

and firms controlled by shareholders from Country Y invest according to the rule

$$(\partial f/\partial K^{\gamma}) - \delta = \theta^{\gamma} r^{\gamma}, \tag{11.61}$$

an efficient allocation of capital is obviously ensured. The general property of equilibrium in a world where some countries employ Schanz-Haig-Simons systems and others the reformed system is that the net interest rates of the reforming countries, the gross interest rates of the non-reforming countries, and the marginal products of capital in all countries take on a common value. This is the reason that piecemeal reforms are possible without disturbing international capital markets.

All previous considerations referred to the efficiency of the international allocation of a given stock of capital. To achieve an overall allocative optimum it is, however, also necessary to have efficiency in the trading of credit contracts. Only if the rates of time preference are the same in all countries is it impossible to find additional mutually beneficial credit contracts between any two households.

Unlike the equalization of the marginal products of capital, equality in the rates of time preference cannot, normally, be produced by the existing systems of capital income taxation even under ideal conditions. As the residence principle equates the gross interest rates despite international tax rate differences, it is obvious that it cannot also equate the net interest rates to which households adjust their rates of time preference (except of course in the case where all tax rates are harmonized).

The reformed system, on the other hand, has no difficulties with the postulate of efficient trade in credit contracts. As it implies that the rate of time preference equals the marginal product of capital in each country and as, when the source principle is applied, it ensures that the marginal

39 Cf. Equation (7.4).

products of capital are the same in all countries, it removes all the differences between the rates of time preference that the existing tax systems bring about.

The reform of capital income taxation will stimulate private savings via a rise in the net market rate of interest. In an open economy, the additional savings will not only be invested in the country in which they originate, but they will spread over the world so as to maintain the equality of the marginal products of capital. An isolated reform will therefore create a gradual flow of capital exports. These capital exports are not comparable with those that result if the equality of marginal products of capital is disturbed for, in principle, the latter involve an international reallocation of capital stocks. Although, in reality, this reallocation cannot be instantaneous and although its dynamic aspects are spared out in the comparative static model used here, it can be expected to involve much larger capital movements in the short run, and to disturb the world economy much more, than the capital exports resulting from an international reallocation of savings flows. It is an attractive property of the piecemeal process of tax reform that, country by country, it removes the wedges between the marginal products of capital and the respective rates of time preference in a way that only necessitates an international reallocation of savings flows, but not a reallocation of capital stocks.

This virtue appears even more important if the problems of multi-product trade and international division of labor are taken into account. Consider the textbook world of the "two by two" Heckscher–Ohlin model. As is well known, in this world, commodity trade and imperfect specialization imply factor price equalization regardless of whether or not factors are allowed to migrate across borders. A tax reform that drives wedges between the marginal products of capital conflicts with the property of factor price equalization and can be expected to have dramatic effects on the international division of labor when capital movements are allowed. As the marginal product curves of capital arc horizontal in the range where both commodities are produced in both countries, a capital market equilibrium obviously cannot be reached before at least one of the countries is driven into perfect specialization.

This, once again, demonstrates the dangers which the hasty introduction of the Accelerated Cost Recovery System created for the world economy since 1981. The neglect of combining this step towards an attractive theoretical system of capital income taxation with a partial substitution of the source principle for the residence principle incurred the risk of eliminating capital intensive industries in the world outside the U.S. and of inducing capital movements into the United States of an order of magnitude much larger than that suggested by a one-commodity model.^{40,41} A tax reform along the lines described is a powerful means of improving the allocation of resources, but, given today's high degree of capital mobility, it is cogent to carefully adjust the taxation of international capital income flows accordingly. Otherwise the reform might cause stability problems to the world that count more than all the efficiency gains a pure general equilibrium model predicts. Policy makers should not forget the lesson they had to learn after the introduction of the Accelerated Cost Recovery System.

11.5. The End: The Reform Proposals in Comparison with the Existing Systems of Capital Income Taxation

While the preceding chapters of this book were devoted to an analysis of existing systems of capital income taxation, this chapter studied systems that, from a theoretical point of view, appeared as attractive alternatives. The last word on which of these systems best satisfies the requirements of rational fiscal taxation has not yet been said, for only a very limited selection of the criteria that are relevant for an evaluation of tax systems could be discussed. Hopefully, this investigation was nevertheless able to provide the further discussion of the subject with some useful hints.

Table 11.1 summarizes the results of this book in that it provides an overview of the evaluations of the different tax system under the aspects considered. The first six columns refer to systems of capital income taxation whose theoretical ideal is based on the assumption of true economic depreciation. The remaining five columns concern the different kinds of cash flow system considered. The rows of the table indicate different evaluation criteria. The first six of these refer to aspects that, in a narrow sense, can be seen to be important from an allocative point of view. The remaining five capture various aspects that may not be so important in terms of the theoretical model used in this book, but are nevertheless quite relevant from a policy perspective. A plus sign in a field of the table indicates a positive, and a minus sign a negative, evaluation.

⁴⁰For a more detailed theoretical analysis of the effects of ACRS in the Heckscher-Ohlin model see Sinn (1984b, pp. 568-572).

⁴¹Fortunately, the policy of tax-cut-cum-base-broadening to which the United States switched with the 1986 tax reform can now be expected to change the trend. Chapter 7 discussed this at length.

Table 11.1 Capital income taxation and resource allocation: a comparison.

-+ °+ 1 C + + + + + proposal, Reform Variant + + + 22 + + + ٦ + + 4 + introduction of an acquisition Neutral with partial removal tax on share purchases by Committee) of affiliation principle or (Meade S-Base tax I ++ + + + + + + + + (Kay and Вгоwп King) tax I + + + + + + + + + + accounting profits Tax on " 1 1 + + I I Source principle for interest taxation. + + + + "Strictly positive tax revenue with Neutrality (+) with $\tau_r = \tau_p$. Тах оп profits pure shrinking tax output ratio. I I + + ÷ a,b habersteuer Teil-4 ١ + I + + + + + imputation . _a,b system Full م + 4 I + + + 1 + + Ţ imputation Partial _a,b system ٦ °+ 60] I + 1 Î + 1 + "Destination principle for value-added tax. ^bResidence principle for interest taxation. Tax systems ^aNeutrality (+) with harmonization. Classical a,b system ٦ <u>م</u> + 1 ١ + 1 + labor/Employment neucontracts structure neutrality DF ~ RP DF~NI Acquisition neutrality Avoidance of radical Capital Shiftability to factor depreciation rules Credit Practicability of Intertemporal Tax revenue Intersectoral neutrality neutrality Financial Evaluation national changes trality trality criteria neu-Inter-

corporations.

The two versions of the profit taxes with true economic depreciation are the clear losers in the comparison as they are unable to generate a growing flow of tax revenue.

The evaluation of the existing systems of capital income taxation (first three columns) is not uniformly positive either, although the optimistic case of full financial flexibility was assumed when drawing up the table. They are all unable to imply growth neutrality of taxation and bring about a number of further disadvantages that have been discussed in previous chapters. A reform that introduces the Teilhabersteuer, that is, a fully integrated Schanz-Haig-Simons system, would bring about only a very modest advantage. This tax beats all or most of the existing systems through its financial and acquisition neutrality, but it shares all other disadvantages.

The evaluation of the cash flow systems of the last five columns is comparatively favorable. The systems advocated by Kay and King and the Meade Committee satisfy ten of the eleven criteria considered. The common disadvantage of both systems is that they require very drastic reforms. Kay and King's proposal excludes deductibility of debt interest and the Meade Committee's proposal requires abolition of the corporate tax on retained profits; both proposals exclude taxation of household interest income.

The three variants of the proposal made in this chapter avoid the disadvantage of drastic reform, but they imply certain difficulties in the international context. The previous section has shown that these difficulties can be overcome by the introduction of the source principle and that there is no need to harmonize tax rates or tax systems across countries. A similar solution in the national context is hardly conceivable, however, and so intersectoral distortions of the Harberger type can be expected when different tax rates on retained profits apply to corporate and non-corporate firms. A harmonization of tax rates, on the other hand, should not create insurmountable difficulties within a country. Thus, not too much weight should be given to the minus signs in the second row.

A similar remark is appropriate for the minus sign that appears with Variant A under the aspect of financial neutrality. As the empirically unimportant channel of equity financing by issuing new shares, and not the channel through profit retentions, is discriminated against, this sign should not be alarming. The price that must be paid if one does not want to introduce Variant B or C but wishes to install an allocatively neutral system of capital income taxation with as few steps as possible is therefore low.

Like some of the other variants, Variants A and C are not acquisition neutral and thus incur the risk of encouraging further economic concentration. It is not necessary, however, to choose Variant B because of this and thus forego double taxation of dividends, as it was shown that acquisition neutrality can be produced with Variants A and C without difficulty by introducing a supplementary tax on share purchases by corporations.

Sometimes reform proposals that can be derived from theoretical models turn out to be impractical in reality. As the last but one row of the table shows, the proposal made here does not have to fear comparison with the existing systems of capital income taxation in this regard. It can at least offer the simple method of immediate write-off in place of the impractical method of true economic depreciation. Should some day a country decide to implement this reformed system, it will do so most probably because of its simplicity rather than because of the theoretical virtues praised in this book.