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TREATMENT OF CAPITAL INCOME IN RECENT TAX REFORMS AND THE COST OF CAPITAL IN INDUSTRIALIZED COUNTRIES

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I. INTRODUCTION

Following the 1986 Tax Reform Act in the United States, the tax systems of most industrial countries are undergoing, or have already carried out, significant changes. The countries where major reforms are being or have been enacted are Australia, Japan, Denmark, and New Zealand. Less drastic reforms are being or have been enacted in France, Germany, Italy, Belgium, Sweden, Norway, the Netherlands, and a few others. On the basis of a worldwide study, Pechman (1987) concludes that these countries have been "impressed by the success of tax reform in the United States, particularly the reduction in the top income tax rate" (p. 1). More important, perhaps, is the widespread discontent with existing tax systems, which are seen to cause serious inequities and misallocations.

In both the individual and the corporate income tax, the predominant principles in these tax reforms were a reduction of the statutory rates and a broadening of the taxable base. In terms of the overall tax burden,

these principles work in opposite directions. Although all these reforms were supposed to be "revenue neutral," i.e., to make tax revenues no greater or lower, they clearly have equity and efficiency effects which should be examined. While the schedular changes and base broadening with regard to labor earnings have been fairly widely documented (see, for example, Pechman, 1987, and Tanzi, 1987) the changes with regard to the taxation of capital income—interest, dividends and capital gains—have been less clear. One reason is the complexity of the laws, even after tax reform, pertaining to corporate income, withholding at source, and short- and long-term capital gains. Another reason is the need to distinguish between nominal and real tax rates. Tax systems which include nominal interest income and allow deductions of nominal interest expenses in the taxable base are not neutral with respect to price changes. That is, effective real tax rates vary with the rate of inflation. In the absence of indexation, the same applies to capital gains. All industrial countries have experienced in recent years a decline in the rate of inflation. A major objective of this paper is to evaluate the impact of these combined changes—reduction in tax rates coupled with elimination of many tax expenditures and a decline in the rate of inflation—on the cost of capital.

II. THE U.S. TAX REFORM

It would not be possible in this paper to give details of the 1986 Tax Reform Act, but the essential elements can be listed:

1. Personal exemptions and standard deductions have been doubled, thereby removing five million people, officially defined as "poor," from the tax rolls. The principle that the poor should not be taxed, as well as the distribution of the tax burden, will be maintained by the automatic adjustment of brackets and personal exemptions to inflation;
2. Increases in the earned income credit for wage earners with families eliminated almost the entire social security tax for those eligible for full credit and decreased the tax burden for low income earners.
3. The new rate structure has four brackets, with rates of 15, 28, 33 and 28 percent, replacing the earlier 14 rates which rose to a maximum of 50 percent. The 33 percent bracket reflects the phasing out, at a 5 percent rate, of the benefits of the lowest tax rate and the personal exemptions.
4. Capital gains are taxed as ordinary income, reflecting the adoption of

the "comprehensive income" concept for tax purposes. The absence of indexation of nominal capital gains on the one hand, and the continued exemption of accrued capital gains on assets transferred by gift or at death on the other, affect the real burden and the economic impact of the tax in opposite directions.

5. Broad elimination of major loopholes, tax shelters, and special benefits. For example, unemployment benefits which were previously taxable only if a married taxpayer's annual income exceeded \$18,000 (\$12,000 for singles) were made taxable regardless of size. Deductions for state and local sales taxes and consumer interest were eliminated. Deductions for unreimbursed business expenses and other miscellaneous expenses were allowed only to the extent that they exceed two percent of income.
6. A limitation was imposed on the deductibility of losses from passive investments, thereby eliminating many tax shelters. The deduction of interest expenses for investment was limited to the amount of investment income. Minimum tax floors for individuals and businesses were strengthened.
7. The corporate income tax rate was reduced from 46 to 34 percent. The tax on dividends was thereby cut from a maximum of 73 to 52.5 percent. On the other hand, elimination of the investment tax credit and the reduction in depreciation allowances (for structures) has broadened the corporate taxable base. The overall outcome is an increase of 20 percent in corporate tax liabilities.

The distributional impact of all these changes has been estimated by Pechman (1989) to be highly progressive.

III. TAX REFORMS IN OTHER COUNTRIES

A large number of industrial countries have followed the United States and have enacted, or are in the process of adopting, major tax reforms. Although the extent and details vary across countries, some common trends can be observed.

1. Reduction in individual tax rates, particularly in the top brackets, and a compression in the number of brackets. Table 1 shows that between 1985 and 1987 the top marginal tax rate was reduced on average from 66 to 56 percent, i.e., a reduction of 16 percent. Leading the list is New Zealand (26 points and scheduled to decline 8 additional points by 1993!), Japan (23 points), as compared with a 22 point reduction in the United States, 10 points in the United Kingdom and 11 points in Au-

TABLE 1
Marginal Tax Rates and Number of Brackets

Countries	Marginal tax rates ^a						Number of brackets	
	1985		1987		1989		1985	1989
	lowest	highest	lowest	highest	lowest	highest		
United States	11	55 ^b	15	43	15	33	15	2-3
Canada	—	52 ^c	—	53	—	48	—	—
Australia	30	60	24	49	24	49	5	4
Japan	10	88	10	76	10	65	15	6
New Zealand	20	66	15	48	15	40	5	3
Denmark	50	73	50	68	50	68	—	—
France	5	65	5	57	5	57	—	—
Germany	22	56	19	56	19	56	—	—
Italy	18	62	11	62	11	62	9	8
The Netherlands	—	72	—	72	—	72	9	3-4
Sweden	—	80 ^d	—	77	—	72	16	3
United Kingdom	30	60	27	60	27	50	—	—
Average	22	66	20	60	20	56	11	4

Source: Pechman (1987, p. 4), supplemented by Pechman (1989) and Vito Tanzi (1987).

^a Combined national and local tax rates.

^b Takes into account the deductibility of local tax when calculating national tax.

^c Includes federal and provincial surtaxes (and the Ontario provincial tax rate).

^d Assumes local tax rate of 30 percent.

stralia. However, no country has gone as far as the United States in terms of the level of the top marginal tax rate. Furthermore, the relative spread between the top marginal rates across countries has somewhat increased (the coefficient of variation is 0.16 in 1985 and 0.21 in 1989). Further attempts toward rate uniformity are expected to take place in the Common Market and elsewhere after 1992. The persistence of these tax differentials may provide an inducement for highly skilled labor migration from high to low tax countries. Although the percentage of individuals at the highest rate may be small,¹ such a "brain drain" may have a significant impact.

2. Tax treatment of income from capital varies significantly across countries. As seen in Table 2, only Germany and the Netherlands tax interest income at the same rate as earnings. In the United Kingdom and

¹ Tanzi (1987) provides OECD data pertaining to 1981, showing that the top tax rate applies to less than 1 percent of taxpayers, but the percentage of tax yields from these taxpayers was between 4-8 percent of total tax revenues. The widening of the brackets after tax reforms has undoubtedly increased the numbers of the taxpayers at the top rate.

TABLE 2
Tax Rates on Capital Income in Selected Countries, 1989

Countries	Interest		Dividends			Top marginal rate on long term capital gains
	Rate of withholding on bonds	Top marginal tax rate or-if withholding is final	Rate of withholding	Top marginal rate or-if withholding is final	Top marginal rate on long term capital gains	
Denmark	0	40	30	40	0 ^d	
France	26 ^a	—	0	57	16 ^e	
Germany	0	56/53 ^c	25	56/53 ^c	0 ^f	
Italy	12.5	—	10	56/53 ^c	0	
The Netherlands	0	72/60 ^f	25	72/60 ^f	0	
United Kingdom	0-25 ^b	40	0	40	30 ^g	

Source: Conseil National du Credit; Lebeque Report, IMF, OECD.

^a Including 1 percent social security contribution.

^b Zero rate for certain public loans.

^c Current rate and proposed rate for 1990, respectively.

^d Stocks held over three years and bonds.

^e If transactions do not exceed F 288,400, capital gains are exempt.

^f Assets held over six months.

^g A £4,000 exemption applies.

in Denmark the top marginal tax rate on interest is 40 percent, while on wage earnings it is 50 percent. In France and in Italy interest income is taxed at its source, at flat rates of 26 percent and 12.5 percent, respectively. The proposed tax reform in Japan also taxes interest income at a uniform 20 percent rate. This tendency to tax financial income at lower, and sometimes uniform, rates is less pronounced when it comes to dividends. As a rule, long-term capital gains are not taxed, or taxed at a significantly lower marginal tax rate (France and the United Kingdom).

There is a striking difference between these countries and the United States. While the 1986 Tax Reform Act in the United States has moved towards a comprehensive income concept in taxing equally all sources of income, there is no discernible trend in this direction among the European countries.

Tanzi (1987) notes that "while there is a lot of similarity in the way countries tax interest incomes, there are wide differences in the way they have been treating interest expenses." His data indicate that Denmark, Finland, Luxembourg, the Netherlands, Norway, Sweden, and the United States were by far the most generous in allowing wide deductibility for interest expenses. On the other hand, Canada, France, Germany, Italy, Japan, the United Kingdom and some other countries were far less generous.

The recent tax reforms have, however, reduced the differences among these countries. For example, before 1986, the United States fully taxed nominal interest incomes of individuals and allowed unlimited deductibility for all interest payments. Japan, on the other hand, exempted interest income and limited interest deductions (for example, for a second residence and on consumer loans. Even the deduction for principal residence mortgage had a low ceiling.) As already noted, the 1986 Tax Reform Act in the United States is phasing out the deductibility of interest expenses, while in Japan a 1987 law extended mortgage deductions in the middle income range; their tax reform in 1988 includes a 20 percent tax on interest income.

3. Corporate tax rates in other countries are also declining, but less drastically than the tax rates on individuals. The average corporate tax rate has declined from 49 percent in 1985 to 43 percent in 1989. New Zealand has the lowest rate (28 percent), the United Kingdom and the Netherlands second (35 percent) and the United States, Australia, and France are third (39 percent). Japan plans a further reduction (to 40 percent) in 1990, and Sweden (to 40 percent) in 1991.

There also seems to be a great deal of uniformity in the European corporate tax systems regarding allowance for depreciation and loss carryover regulations (Table 3). The United States is significantly more

TABLE 3
Depreciation and Loss Carryover in Corporate Tax Systems

Countries	Lifetime for tax purposes		Loss carryover	
	Machinery	Buildings	Carry forward	Carry backward
United States	3-10	15-20	15	3
Denmark	10	30	5	0
France	10	20	5	0
Germany	10	25	5	2
Italy	8.5	21.3	5	0
The Netherlands	10	33	8	3
United Kingdom	- ^a	25	No limit	1

Source: International Bureau of Fiscal Documentation, OECD, Paris, Price Waterhouse.

^a Declining balance method with a 25 percent rate.

generous in allowing faster depreciation rates and carryover losses both backward and forward.²

In reducing investment tax incentives, the United Kingdom led the way in 1984 by eliminating expensing for plant and equipment, using the tax revenues to reduce the corporate rate from 50 to 40 and then 35 percent. The United States and Canada have also eliminated the investment tax credit and reduced the corporate tax rate. Australia has temporarily increased its corporate tax rate but this should be partially offset by relief for dividends received by stockholders. The countries with high corporate tax rates—Germany, Japan, Sweden, and Denmark—may have to reduce their rates to be competitive in international markets.

The combined effect of base-broadening and rate reduction has been on average to keep corporate tax revenues intact, i.e., revenue neutral (Table 4).

4. There are major differences between countries with respect to capital gains taxation of traded stocks. Only the United States and Australia regard capital gains as ordinary income, i.e., tax these gains at the same rate as earnings. All other countries either fully exempt or tax at extremely favorable rates long-term gains (i.e., gains on stocks held longer than a year, or, in Sweden, longer than two years) (Table 5). Pechman (1989) thinks that "this attitude reflects the long standing European view that capital gains are not income." These countries also doubt the possi-

² After 1986, the depreciation method for equipment is the declining balance (at 200 percent) or straight line, whichever provides the maximum deduction, and declining balance (at 150 percent) on structures.

TABLE 4
Corporate Income Tax Rates and Tax Revenues As Percent
of Total Tax Receipts

Countries	Corporate income tax rates ^a			Corporate income tax revenues as percent of total tax receipts	
	1985	1987	1989	1980	1987
United States	51	45	39	10	8
Canada ^b	52	52	44	12	8
Australia	46	49	39	12	10
Japan ^{c,d}	55	55	53	22	21
New Zealand	45	48	28	8	9
Denmark	50	50	50	3	4
France ^c	50	45	39	5	5
Germany	56	56	56	5	5
Italy	46	46	46	8	4
The Netherlands	43	42	35	7	8
Sweden	52	52	52	2	4
United Kingdom	40	35	35	8	11
Average	49	44	43	8	8

Source: Corporate Tax Rates: Pechman (1987, p. 5), supplemented in Pechman (1989); Corporate Tax Revenues: OECD, Committee on Fiscal Affairs, DAFFFE/CFA/89.14.

^a Combined national and local tax rates.

^b Tax rate for non-manufacturing corporation. Tax for a manufacturing corporation is lower.

^c Tax on undistributed profits only. Tax on distributed profits taxed at lower rate in Germany and Japan and at a higher rate in France (beginning in 1989).

^d Takes into account the deductibility of local tax from national tax.

bility of restricting the deduction for net capital losses, as imposed by the United States (\$3,000 annually).

Except Australia, no country that taxes capital gains has adopted indexation of the buying value.

IV. INTEREST INCOME TAXATION, INFLATION, AND THE REAL COST OF CAPITAL

The major factors in the tax system that distort the lending-borrowing decisions are its treatment of interest income and the deductibility of interest expenses. In the presence of inflation, it is particularly important whether the tax system distinguishes between *nominal* and *real* in-

TABLE 5
Individual Taxation of Capital Gains on Portfolio
Stock Investments, 1989

Country	Maximum short-term capital gain tax rate (percent) ^a	Maximum long-term capital gain tax rate (percent) ^a	Period to qualify for long-term gain treatment	Maximum annual net worth tax rate (percent)
United States ^b	33.0	33.0	One year	None
Australia ^c	50.3	50.3	One year	None
Belgium	Exempt	Exempt	None	None
Canada ^d	17.5	17.5	None	None
France ^e	16.0	16.0	None	None
Germany ^f	56.0	Exempt	Six months	0.5
Italy	Exempt	Exempt	None	None
Japan ^g	5.0	5.0	None	None
The Netherlands	Exempt	Exempt	None	0.8
Sweden	45.0	18.0	Two years	3.0
United Kingdom ^h	40.0	40.0	None	None

Source: C. Walker and M. Bloomfield, "The Case for the Restoration of a Capital Gains Tax Differential," *Tax Notes*, May 22, 1989, p. 1021.

^a State, provincial, and local taxes are not included. They can in some cases be substantial. Furthermore, in some countries exclusion rules might apply.

^b The nominal tax rate for long- and short-term capital gains is 28 percent. The marginal rate, however, rises to 33 percent for joint returns between \$74,850 and \$155,370 and for single returns between \$44,900 and \$93,130 for calendar year 1989.

^c Indexing is allowed on long-term capital gains.

^d Canadian residents are allowed an annual capital gains exemption of Can \$30,000 subject to a cumulative exemption of up to Can\$500,000. In 1990, the lifetime capital gains exemption is reduced to \$100,000, except for owner/operators of farms and small business corporations who may continue to apply the \$500,000 limit.

^e Gains from proceeds of up to F 272,000 are exempt from taxation in a given taxable year.

^f The first DM 1,000 of short-term capital gains is exempt from tax.

^g Japan's tax reform plan, which took effect in 1989, imposes a maximum tax of approximately 5 percent on the sale of securities.

^h Only gains and losses accrued since 1982 may still be taxed; gains since 1982 are indexed.

terest. In the absence of taxes on interest, the nominal rate of interest has to increase by the rate of inflation in order to keep the real rate of interest unchanged. When nominal interest incomes are taxed and nominal interest payments are deductible expenses, the increase in the nominal rate of interest, r , is related to the real rate of interest, r^* , to the rate of inflation, Π , and to the rate of interest taxation, t , by the well-known formula:

$$r = r^* + \frac{\Pi}{1 - t} \quad (1)$$

The rate r is sometimes called the "required" rate of interest (Tanzi, 1987).

As seen in Table 6, the rate of inflation in the 1980s has decreased in all industrial countries. While the average rate of inflation has been 12.5 percent in 1980, it came down to 3.5 percent in 1987. As we have seen, tax rates also decreased during the same period. Both of these factors worked to reduce the required rates of interest. It is interesting to inquire whether these rates have conformed with formula (1), keeping the real rates of interest invariant.

In Table 7 we have calculated the "required" interest rates in different countries during 1980–1989, using the data on rates of inflation (Table 6) and on tax rates (Table 1); under the assumption that the real rate of interest is 4 percent. As expected, the average of the "required" rates declined significantly during this period, from 22.2 percent in 1985 to 12.8 percent in 1989, i.e., a decline of 9 percent. The bulk of this decline (about 70 percent) is due to the decrease in inflation rates, the rest is due to the reduction in tax rates.

Did the actual interest rates change to the same extent as the "required" rates? If changes in the actual rates of interest were less or more accentuated than those in the required rates, this implies that the real rates facing lenders and borrowers were not invariant.

TABLE 6
Inflation Rates in Industrial Countries Undergoing Tax Reform

Countries	Inflation rates (consumer prices)			
	1980	1983	1985	1987
United States	13.5	3.2	3.6	3.7
Canada	10.2	5.8	4.0	4.4
Australia	10.1	10.1	6.7	8.5
Japan	8.0	1.9	2.0	—
New Zealand	17.2	7.4	15.4	12.3
Denmark	12.3	6.9	4.7	4.0
France	13.3	9.6	5.8	3.3
Germany	5.4	3.3	2.2	0.3
Italy	21.2	14.6	9.2	4.7
The Netherlands	6.5	7.8	2.2	-0.5
Sweden	13.7	8.9	9.4	4.2
United Kingdom	18.0	4.6	6.1	4.2
Average	12.5	7.0	5.9	3.5

Source: Inflation Rates—IMF, *International Financial Statistics*, 1988.

TABLE 7
"Required" and Actual Interest Rates in Industrial Countries Undergoing Tax Reforms

	"Required" interest rates ^a					Deposit rates				Lending rates		
	1980 ^b	1983 ^b	1985	1987	1989 ^c	1985	1987	1989	1985	1987	1989	
United States	34.0	11.1	12.0	10.5	9.5	8.05	6.86	6.72	9.93	8.21	8.59	
Canada	25.3	16.1	12.3	13.4	12.5	8.46	7.66	8.44 ^d	10.58	9.52	9.75	
Australia	29.3	29.3	20.8	20.7	20.7	10.46	13.77	11.50	15.96	19.83	18.08	
Japan	70.7	19.8	20.7	4.0	4.0	3.50	1.76	1.76	6.52	5.09	4.92	
New Zealand	54.6	25.8	49.3	27.7	24.5	14.71	18.42	—	—	—	—	
Denmark	49.6	29.6	21.4	16.5	16.5	8.21	7.03	—	14.65	14.17	—	
France	42.0	31.4	20.6	11.7	11.7	6.80	5.31	4.90	17.77	15.82	15.80	
Germany	16.3	11.5	9.0	4.7	4.7	4.44	3.20	2.78	9.53	8.36	8.07	
Italy	59.8	42.4	28.2	16.4	16.4	10.90	7.02	6.60	18.15	13.57	13.50	
The Netherlands	27.2	14.0	11.9	2.2	2.2	4.10	3.55	3.45	9.25	8.15	7.00	
Sweden	72.5	48.5	41.0	22.3	19.0	11.83	8.94	8.75	16.72	12.99	13.14	
United Kingdom	49.0	15.5	19.3	14.5	12.4	8.87	5.35	3.72	12.29	9.63	8.67	

Source: Deposit and Lending Rates, IMF, *International Financial Statistics*, 1988, p. 68.

^a Required interest rate = $4 + \frac{\text{Inflation rate}}{1 - \text{top marginal tax rate}}$.

Data from Tables I and 6.

^b Assuming tax rates as in 1985.

^c Assuming inflation rate as in 1987.

^d 1987, IV.

Table 7 also provides data on deposit and lending interest rates during 1985–1988. As expected, these rates declined significantly (average lending rates, for example, went down from 12.9 percent in 1985 to 10.7 percent in 1988), but not to the same extent as the required rates. In fact, a linear regression of the required rates, r , on lending rates, r_1 , yields

$$r = -2.17 + 1.43 r_1 \quad (R^2 = 0.52) \quad (2)$$

(1.85) (0.25)

A coefficient of 1.43 (highly significant with 32 observations) and insignificant intercepts imply that actual interest rates adjust *only partially* (about 0.7 of a percentage point for each 1 percentage point) to changes in the required rates. This means that the decline in the tax rates and in the rate of inflation had a *real* effect toward reducing real interest rates.

A direct way to measure the effect of the tax on interest income is to calculate the effective real marginal tax rate for recipients of interest income:

$$\text{effective real marginal tax rate} = \frac{r_1 t}{r_1 - \Pi} \quad (3)$$

where t was taken as the top individual marginal tax rate. These calculations are presented in Table 8. In 1989, the United States had the lowest real tax rate, while in 1985, Germany had the lowest rate. It should be emphasized that these are the tax rates that would apply if interest income was taxed as ordinary income, as is the case in the United States. Japan, for example, did not tax interest income until 1989 and will now tax it at a flat 20 percent rate.

More significant, presumably, is a comparison of the real rates faced by borrowers who can deduct nominal interest expenses. A major reason for the attention in recent years to the tax treatment of interest expenses has been the combination of high inflation rates and the unlimited deductibility of nominal interest expenses. As Tanzi (1987) notes, after-tax interest rates were negative for many taxpayers, creating an inducement for consumption and low savings. He notes that in Denmark, for instance, in 1985 interest deductions by individuals were 16 percent of personal income. For many individuals these deductions could be taken against marginal tax rates of 73 percent.

As a result, Denmark now limits the tax rate against which interest deductions are allowed to 50 percent. Similar negative effects of interest deductions were felt in the other Scandinavian countries and reforms were undertaken reducing the advantages of borrowing. Dividing coun-

TABLE 8
Real Interest Rates, Effective Real Marginal Tax Rates on Interest Income, and Real Borrowing Rates

Countries	Real interest rates ^a		Effective real marginal tax rates ^b		Real borrowing rates ^c	
	1985	1989	1985	1989	1985	1987
United States	6.3	4.9	86.3	58.0	0.9	2.1
Canada	6.6	5.4	83.6	87.5	1.1	0.7
Australia	9.3	9.6	103.4	92.5	-0.3	0.7
Japan	4.5	4.9	127.0	65.0	-1.2	1.7
New Zealand	—	—	—	—	—	—
Denmark	10.0	—	107.5	—	-0.7	—
France	12.0	12.5	96.5	72.0	0.4	3.5
Germany	7.3	7.8	72.8	58.2	2.0	3.3
Italy	9.0	8.8	125.7	95.1	-2.3	0.4
The Netherlands	7.1	7.5	94.5	67.2	0.4	2.5
Sweden	9.3	8.9	143.5	105.8	-4.1	-0.5
United Kingdom	6.2	4.5	119.1	97.0	-1.2	0.1

^a Lending Rate - Inflation rate

^b $\frac{\text{Lending Rate}}{\text{Real Interest Rate}} \times \text{Marginal Tax Rate}$

^c Lending Rate (1 - Marginal Tax Rate) - Inflation Rate

tries into those with the most generous treatment and those with the least generous treatment of interest deductions, Tanzi (1987) finds that household savings out of disposable income has been significantly lower in the former group (an average of 4 percent vs. 9 percent in 1985).

Table 8 indicates that the decrease in the rates of inflation and the reduction in marginal tax rates has increased the average real borrowing rate of interest from -0.5 percent in 1985 to 1.5 percent in 1987. The United States rate in 1987 was higher than in Japan (1.7) and the United Kingdom (0.1) but lower than in France (3.5) and Germany (3.3).

V. EVALUATING THE EFFICIENCY GAINS FROM LOWER TAXES ON CAPITAL INCOME

The previous discussion has demonstrated that in most countries, capital income is taxed at preferentially low rates. While in the United States the equalization of tax rates on ordinary income and capital gains has been a keystone of the tax reform, no such tendency is evident in other countries. This, and the recent debate in the United States on rolling

back capital gains taxation to a maximum of 15 percent, raised the natural question of whether such differential tax rates are efficient.

Economists have long been aware that, from an efficiency point of view, comprehensive income taxation will be the exception rather than the rule. Models that attempt to determine the optimal structure of income tax rates on earnings and on income from capital, depending on labor supply and on savings elasticities, rarely give rise to equal tax rates. Actually, some of the most commonly used models justify *no* taxation of capital income, i.e., taxation of earnings and an exemption for capital income (see, for example, Sheshinski, 1989, and the references therein). Even in these circumstances, however, equity considerations may induce some taxation of capital. While a detailed analysis of this issue is clearly beyond the objectives of this paper, it seems worthwhile to provide some evaluation of the welfare gains obtained in moving to lower tax rates on capital income.

Feldstein (1978) has shown that the gains of a shift from equal tax rates on capital and labor to an income tax imposed only on labor earnings (keeping tax revenues intact) are equal between 2 and 2.5 percent of total labor income in the United States. This is a major efficiency gain.

We have adopted the elasticities assumed by Feldstein: labor supply wage elasticity of .3 and a savings elasticity with respect to the interest rate of .07, and have shown (Appendix) that the efficiency gains are somewhat about 1.2 percent of total labor income—and, more important, that 80 percent of this welfare gain is obtained by reducing the capital income tax to *half* the rate of the tax on earnings. Thus, while a departure from comprehensive income taxation toward lower taxation of capital income may lead to substantial welfare gains, most of these gains are obtained before a 2:1 ratio of labor to capital income rates are attained, and welfare is quite insensitive to further reductions in capital taxation (accompanied by an increase in labor taxation).

VI. CONCLUDING REMARKS

This paper has surveyed the major trends in tax reforms in industrial countries, particularly in relation to the taxation of income from capital—interest, dividends, and capital gains. It has been demonstrated that, while reforms concerning the tax treatment of earnings have a common tendency to reduce marginal rates, particularly the top rates, coupled with a broadening of the tax base (“leveling the playing field”), no such tendency is observed with regard to the taxation of income from capital. No other country has adopted the comprehensive income concept, which underlies the United States’ 1986 Tax Reform Act. Without

exception, interest income and, to a lesser extent, dividends are taxed at favorably low rates (including zero) and long-term capital gains are, as a rule, exempt.

All tax systems have avoided indexing capital income to changes in the price level. As a consequence, the presence of high and variable inflation rates has been a major source of distortion in the capital markets. In spite of reductions in marginal tax rates, net rates of return to lenders have been negatively affected by inflation, i.e., actual nominal rates have not fully compensated for inflation and lagged behind the rates "required" to preserve the real rates. The nominal basis has also been the major factor that prevented a convergence of effective real tax rates across countries.

Faced with negative or very low real interest rates for borrowers, many countries attempt to curb the negative effect on household savings by imposing limits on interest deductibility.

The Scandinavian practice of taxing *net* capital income at the lowest marginal rates in the individual income tax schedule is similar in spirit to the proposed flat tax rate (20 percent) on interest income proposed in Japan and Israel.

Adjustments of interest and capital gains for inflation and the use of real economic depreciation seem to be the best method to eliminate most of the tax benefits of tax shelters. Furthermore, indexation is a necessary condition for further harmonization of tax rates in different countries.

APPENDIX

We wish to analyze the welfare cost of capital income taxation relative to labor income. Following Feldstein (1978) and Green and Sheshinsky (1979), consider a two-period model, in which labor supply in the first period is variable and the individual's second-period consumption is the after-tax value of his savings. Two tax rates are to be selected: a tax on labor earnings and a tax on interest income. Individuals are assumed to maximize

$$U(c_1, c_2, 1 - L) = \alpha \log c_1 + \beta \log c_2 + \gamma \log (1 - L) \quad (\text{A.1})$$

subject to

$$c_1 + \frac{c_2}{1 + r} - wL = 0 \quad (\text{A.2})$$

where c_1 = first-period consumption; c_2 = second-period (retirement) consumption; $1 - L$ = leisure in the first period; r = net (after-tax) interest rate; w = net (after-tax) wage rate, in units of c_1 . The non-negative constants α , β and γ can be chosen, without loss of generality, to satisfy $\alpha + \beta + \gamma = 1$. The expenditure function, E , associated with (A.1) is

$$E(w, r, u) = A(1 + r)^{-\beta} w^\gamma e^u - w \quad (\text{A.3})$$

where $A = \alpha^{-\alpha} \beta^{-\beta} \gamma^{-\gamma}$. Compensated demands are given by the partial derivatives of E w.r.t. prices. The price of second-period consumption is $1/(1 + r)$ and the price of leisure is w . Thus,

$$\begin{aligned} c_1 &= \alpha A (1 + r)^{-\beta} w^\gamma e^u \\ c_2 &= \beta A (1 + r)^{-\beta} w^\gamma e^u \\ 1 - L &= \gamma A (1 + r)^{-\beta} w^{\gamma-1} e^u \end{aligned} \quad (\text{A.4})$$

where c_1 is obtained from the identity $E = c_1 + \frac{c_2}{1 + r} - wL$.

There are two (ad valorem) taxes: an earnings tax at the rate τ , and a capital income tax at a rate t . Thus, net returns are related to gross returns \bar{r} and \bar{w} by

$$\begin{aligned} r &= \bar{r}(1 - t) \\ w &= \bar{w}(1 - \tau). \end{aligned} \quad (\text{A.5})$$

The present value of tax receipts, T , evaluated at the pre-tax rate of interest is given by

$$T = \bar{w}\tau L + \frac{t\bar{r}}{1 + \bar{r}} S \quad (\text{A.6})$$

where savings, S , are

$$S = wL - c_1. \quad (\text{A.7})$$

Minimizing (A.3) w.r.t. t and τ , subject to (A.6) yields a result which, I believe, is well-known: *The optimum tax rates τ^* and t^* satisfy $t^* = 0$ and*

$\tau^* > 0$, i.e. capital income is not taxed. The reason for this outcome in the (logarithmic) model is due (in terms of the Corlett-Hague-Ramsey formulas) to the equality of the cross (compensated) elasticities of consumption in the two periods with leisure. This is equivalent to taxing labor income (subsidizing leisure) alone. Although this result is confined to the logarithmic utility case, it provides a strong *prima facie* case against capital income taxation. Now let us consider the welfare loss due to deviations from the efficient solution.

Suppose, initially, that a comprehensive income tax is in effect (as in the 1986 U.S. tax reform). Let the initial tax rates on labor and capital income be equal at 40 percent: $t = \tau = .4$. The following parameter values correspond to Feldstein (1978):

$$\begin{aligned}\alpha &= .63 \\ \beta &= .07 \\ \gamma &= .30\end{aligned}\tag{A.8}$$

These imply a savings rate of 10 percent out of earnings and a marginal propensity to spend on leisure of .3. With a 25-year savings horizon and a pre-tax interest rate of 12 percent per annum, $\hat{r} = 17$. With these parameters, we calculated from (A.6), that $T = .4924$. To keep tax revenues intact, an elimination of the tax on capital income requires raising the tax rate on labor earnings to $\tau = .4205$.

The dead-weight loss of the tax system, L , is defined by

$$L(t, r, u) = E(w, r, u) - E(\bar{w}, \bar{r}, u) - T(w, r, u).\tag{A.9}$$

We can now calculate the gain in the dead-weight loss due to the elimination of the capital income tax, ΔL , keeping tax revenues intact:

$$\Delta L = L(t - \tau - .4, u) - L(t - 0, \tau - .4205, u) = .008535.\tag{A.10}$$

That is, the tax system without capital income taxation induces a gain of 1.22 percent of initial labor income ($wL = .7$), or about \$18 billion in the U.S. economy. This is 1.73 percent of the present value of tax revenue, a significant efficiency gain. However, it turns out that most of the welfare gain is obtained by reducing the capital income tax to 20 percent and a relatively flat welfare function below this level. In fact, 80 percent of the welfare gain could be realized by this reduction. So, when equity considerations are incorporated, it seems reasonable to argue that a 2:1 ratio of

labor to capital income taxes strikes an optimal balance between efficiency and equity considerations.

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