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## The Incentive Effects of the Taxation of Income from Capital in the Italian Corporate Sector

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The Incentive Effects of the Taxation  
of Income from Capital  
in the Italian Corporate Sector

by

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Obviously, the author retains the responsibility for any remaining errors or shortcomings in the paper.

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## Introduction.

This paper investigates the potential distortions of investment and savings decisions induced by the taxation of income from capital and by investment incentives in the Italian economy. The study concentrates on the corporate sector and on private domestic savings channeled into this sector.

Discussion of these issues in Italy seems to suffer from a sort of schizophrenia. Attention is usually focused either on specific investment incentives (such as cash grants and subsidized loans), or on the effects of the corporate tax system taken in isolation, or else on personal taxation of income from financial assets (interests, dividends and capital gains). This paper is an attempt to shed some light on the effects induced by the interaction of all the above provisions.

The methodology used follows the well-known approach elaborated by King and Fullerton (1984) in computing effective marginal total tax rates<sup>1</sup> for a series of hypothetical investment projects, which differ according to the asset being acquired, the industry in which the investment is undertaken, and the particular form used to provide the necessary finance.

As with other comprehensive measures of economic phenomena effective marginal tax rates suffer from several drawbacks and consequently must be interpreted with caution<sup>2</sup>. Nevertheless they can be useful for several specific purposes: to examine the major allocative distortions induced by the tax system, to evaluate the effects of tax change proposals, to make international comparisons.

The main results obtained from the present study, which computes marginal tax rates for 1980 and 1985, may be summarized

under four main points.

Firstly, Italy shows a much lower overall tax rate on income from capital than the United Kingdom, the United States, West Germany and Sweden<sup>3</sup>. However, the distortions induced among assets, industries, sources and channels of financing are just as striking in Italy. Thus, the Italian tax system seems to be a typical example of one that distorts the allocation of real and financial resources, while collecting on average almost no revenue from a marginal investment.

Secondly, both corporate and personal taxation are much more favourable than a comprehensive income tax would be. The corporation tax is in fact a subsidy to marginal investment because of the generosity of allowances for depreciation and interest payments that firms may claim. As a result the increase in the statutory corporate tax rate, which occurred in the first half of the eighties in Italy, had the effect of increasing the incentive to invest in the corporate sector.

Thirdly, inflation exerts powerful effects on effective tax rates because of the lack of indexation for tax purposes. In general the overall tax rate is reduced by inflation, but distortions are enhanced.

Finally, effective tax rates are very sensitive to different assumptions about the actual financing methods of corporations. In particular, a marginal investment financed through debt is highly subsidized. Despite the dividend tax credit the highest tax is borne by a marginal investment financed through new share issues.

The outline of the paper is as follows.

Section 1 provides an overall picture of the major tax provisions (including investment incentives) affecting decisions

on investment and savings in Italy. Particular attention is given to the main issues discussed by policy makers and to the changes, if any, which followed the wide tax reform enacted in the early seventies.

Section 2 describes how the approach King and Fullerton (1984) developed for computing effective marginal tax rates has been applied to the Italian economy. Both the theoretical framework and the way in which the details of the Italian tax code have been incorporated into the calculation of effective tax rates are discussed.

Section 3 presents the empirical results. Here, along with effective marginal tax rates for 1980 and 1985 we evaluate the effects of a modification in the accelerated depreciation scheme on fixed assets, which will come into force in Italy in 1988. This tax change is introduced by the so-called "Testo Unico" of direct taxation, drafted by the government with the main purpose of collecting and reorganizing the existing legislation. The most noticeable effect of this new law is to increase the effective tax rate on long-lived assets, such as buildings. Apart from this change however the "Testo Unico" leaves untouched the major tax differentials induced by the present tax system as far as assets, industries and above all the different ways through which savings may be channeled to finance a marginal investment are concerned. To abolish these differentials a much wider tax reform, which takes into account both corporate and personal taxation would have to be implemented.

## 1. The evolution of tax legislation since 1974.

### 1.1. The corporate tax system.

Companies in Italy are liable to two income taxes, levied at a proportional rate: the corporation income tax (Irpeg) and a so-called local income tax (Ilor), whose revenue is however collected by the state. Since this system was put into force with the tax reform of 1974 there have been two major changes.

As from 1978 the local income tax was made deductible against the corporate tax base and an imputation system was introduced. Shareholders (whether individuals or corporations) receive a tax credit on dividend that fully offsets the corporation tax, but not the local tax, paid by the company<sup>4</sup>.

The second major change concerned the level of the tax rates. Within a fairly short period of time the total corporate tax rate (inclusive of Irpeg and Ilor) increased by more than ten percentage points: from 36.25 percent in 1981 to 46.37 percent in 1983.

From the theoretical point of view it is widely recognized that an increase in the corporate tax rate does not necessarily imply an increase in the cost of capital<sup>5</sup>. On the contrary, it might actually reduce it, and increase the incentive to invest, depending mainly on the generosity of the deductions allowed from the tax base.

Attention will be focused here on the two principal (negative) components of corporate taxable income: depreciation allowances and interest payments, even though other aspects of the Italian legislation on corporate taxation could play some role in affecting investment decisions<sup>6</sup>.

Depreciation allowances are given, on a straight-line basis, at rates laid down by the Ministry of Finance. These rates are



specified for a detailed number of fixed assets and industries. Apart from some modifications introduced in the first half of the sixties, with the explicit objective of "taking into account changes in the production techniques and the evolution of the general economic situation"<sup>7</sup>, the lifetimes for tax purposes have remained for the most part constant in the following years. Nonetheless, according to our estimates (see section 2.2.2), they seem to be much shorter than the economic asset lives usually employed (under the assumption of straight-line depreciation) to estimate the capital stocks or depreciation in national accounts. In manufacturing, for example, the average fiscal life is about 7 years for machinery, 5 for vehicles and 28 for buildings. The corresponding average economic lives, which have also been recently employed to estimate the capital stocks<sup>8</sup>, are approximately: 17 years for machinery, 10 for vehicles and 37 for buildings.

Besides this there are other advantages. In addition to ordinary depreciation firms are in fact allowed to deduct an extra 15 percent of the cost of the asset during the first three tax periods. This means that an asset, such as computers, with a normal depreciation rate of 18 percent may in practice be written off within a period of approximately three years (at a rate of 33 percent).

Since it was introduced at the beginning of the fifties accelerated depreciation has become a permanent feature of the Italian tax system. Occasionally, however, the rules defining the additional depreciation allowances have changed. The present scheme has been in force since 1974, and will be changed again in 1988 by the "Testo Unico" of direct taxation. For long-lived assets, such as buildings (whose depreciation rates are much

lower than 10 percent) the new accelerated depreciation scheme is much less generous than the present one (see section 3.3). This is because the maximum amount of additional depreciation allowance that firms may claim (in the first three years) will be, under the new scheme, a fixed proportion (1.5) of the normal depreciation rate, instead of being, as it is now, a fixed proportion (0.15) of the cost of the asset.

The legislation concerning the deductibility of interest payments -the second most important deduction allowed from the corporate tax base- has been much more controversial and changeable than that on depreciation allowances. Every time, however, there has been just one single, well-defined objective: to limit and finally eliminate the opportunities for riskless tax arbitrage opened up for firms on account of the existence of tax-exempt government bonds<sup>9</sup>.

In general it may be said that up to 1984 interest payments were deductible according to a coefficient which became lower the higher the proportion between tax-exempt income and total receipts (taxable and exempt) was in the economic account of the company. This restriction was not sufficient however to prevent the possibility of tax arbitrage. The level of interest rates on bank borrowing and on government bonds made this activity extremely advantageous in 1984 and not surprisingly, firms became rapidly and increasingly engaged in it. At the end of 1984, after a lively debate, the authorities decided to confront the problem. But instead of tackling it directly, by taxing government bonds (which constitute about 28 percent of total private financial wealth in Italy), they introduced further limitations to interest deductibility. In brief, companies were allowed to deduct from the tax base only the portion of

interests in excess of tax-exempt income. This aspect of the tax code is still in force, even though it is now unnecessary as far as new bond issues are concerned. The reason is that as from September 1986 the tax exemption traditionally given in Italy on government bonds was abolished. A withholding tax is levied at source on interest paid by the government. But if the recipient is a company this deduction does not constitute a final tax payment. Interest income on government bonds is now in fact fully and explicitly included in the tax base of corporations.

#### 1.2. The adjustment for the effects of inflation.

After the tax reform of the early seventies Italy went through a period of particularly high inflation. The average annual rate of increase of the consumer price index was 15.6 percent over the period 1974-85.

Naturally, this situation stimulated much discussion on the distortions induced by inflation both on personal and corporate taxation. Even though tax indexation proposals were frequently put forward in the debate, the tax authorities never manifested any serious intention to introduce an inflation-proof accounting system for tax purposes. To allow for the effects of inflation they preferred to introduce from time to time specific (ad hoc) provisions.

As far as the taxation of firms is concerned we may say that tax legislation was only concerned with offsetting those inflation-induced effects which are detrimental to firms.

Apart from the deductibility of interest payments mentioned in section 1.1, no other limitation to the deductibility of nominal rather than real interest payments was ever introduced. It is well known that the inflationary bias is in this case favourable

to firms, which are in practice allowed to deduct as costs the fall in the real value of the principal (due to inflation).

On the other hand, the negative effects induced by the historical cost accounting principles on the corporate tax base have been at least partially offset.

As far as inventories are concerned firms may use among other acceptable methods the last-in first-out (Lifo) accounting system.

Depreciation write-offs are based on historical cost accounting principles. But on several occasions firms have been allowed to reevaluate their assets. This happened immediately after the Second World War, and again, owing to the upsurge in inflation of the early seventies, in 1975 and 1983, with two separate laws. A new bill on the issue is now under discussion in Parliament<sup>10</sup>.

### 1.3 Investment grants and incentives.

In addition to accelerated depreciation, a variety of investment incentives is available to firms in Italy. Tax rebates are granted for companies operating in the Southern regions, or on profits earned in the North, but reinvested in the South<sup>11</sup>. A similar incentive (namely, a partial exemption of reinvested profits) has been recently made available (by the law n.163 of 1985) for a temporary period in a particular sector of economic activity ("motion picture and other entertainment services").

Another interesting fiscal incentive, originally introduced in Italy in 1977 for a temporary period, but still present in our tax system, is the so-called "negative V.A.T.". It is in fact a particular form of investment tax credit granted to manufacturing and extractive industries. Firms are allowed to deduct a certain

percentage (usually 4 percent) of investment expenditure from the Value Added Tax due. Eligible investment has frequently been changed. Sometimes investment in buildings has been excluded or the incentive has been limited to the Southern regions or to particular investment projects.

By far the most important investment incentives used in Italy are, however, cash grants and subsidized interest loans. Both were introduced in the fifties with the major aims of stimulating capital accumulation in the South (as well as in other depressed areas of the country), and encouraging investment undertaken by small and medium-sized industrial firms. Gradually more and more objectives have been pursued, and the legislation on investment grants and subsidized loans has become so wide and complex that it can hardly be summarized<sup>1 2</sup>.

A major overhaul occurred in 1976 with the law n.183 that was enacted also with the purpose of reorganizing and simplifying the pre-existent legislation on incentives awarded for the depressed areas of the country and for small and medium-sized industries. The criteria according to which incentives were distributed remained, however, fairly complex. The rate of grant as well as the specific provisions concerning subsidized loans (subsidized interest rate, amount of the loan, etc.) depended, under this law on: (a) the geographical area; (b) the nature of the investment project; (c) the amount of capital expenditure; (d) the dimension of the firm.

Almost contemporarily, a major nation-wide intervention took place, with the law n.675 of 1977 for "industrial restructuring and reconversion". This intervention provoked a great deal of discussion and controversy mainly because it was deemed inconsistent with the previously mentioned legislation.

Apparently, instead of favouring the depressed regions of the country and the small firms, it benefitted mostly the big industries of the North<sup>13</sup>.

Along with this legislation, which became fully operative in the eighties and concerned mainly manufacturing, a wide number of other special or sectorial laws have been enacted in the seventies and in the eighties. Investment grants in the form of cash grants or subsidized loans are for example awarded for investment in the commercial sector (law n.517 of 1975); for research and technological innovation (law n.46 of 1982); for capital expenditure on high technology machinery made by small and medium-sized enterprises (law n.696 of 1983) and so on.

In general we may say that there has been a widespread and increasing dissatisfaction with the use of these tools to promote capital accumulation. In a recent Report drafted by the Industry Commission of the Senate House (Senato della Repubblica, Commissione Industria, 1986) the following areas of major concern and criticism are pointed out: the lack of consistency and the complexity of the legislation; the high degree of discretionary power held by the authorities in charge of granting the incentives; the sluggishness of the bureaucratic procedures and the consequent uncertainty surrounding the timing and the amount of the awarded benefit. As a remedy, it has been suggested that the use of cash grants and above all of subsidized loans (which discriminate in favour of debt financing) should be limited, and that the use of fiscal incentives should be increased.

Neither an investigation of the existing fiscal incentives, nor an analysis of their effects is undertaken in the above mentioned Report. Nevertheless, several proposals are put forward. It is suggested for example that depreciation allowances

should be further liberalized, reinvested profits in excess of depreciation should be exempted from taxation and that the dividend tax credit should be substituted by the deduction of dividends from the corporate tax base.

#### 1.4 Sources and channels of investment financing.

Figure 1 illustrates the major sources of funds available to firms and the most important routes through which private domestic savings may be channeled in Italy to finance investment. The data are averages for the period 1980-85<sup>14</sup>, except where a final investor (either a household, or an investment fund or an insurance company) is shown, in which case data refer separately to 1985 and, in brackets, to 1980. The reason for this asymmetric treatment is simply that one of the final investors considered, namely investment funds, only started operating in Italy in 1983.

The top part of Figure 1 illustrates the proportion of debt and equity finance. This information, showing an average debt-equity ratio greater than one, must however be interpreted with some care<sup>15</sup>. First of all because of the lack of statistical information concerning the market value of a firm's assets and liabilities, which prevents (in inflationary periods) a proper calculation of the firm's leverage. Secondly, because it conceals a much more complex reality. During the eighties the financial structure of the firms has improved notably in Italy. The economic recovery and the increase in profits which has taken place since 1983 has allowed firms to reduce greatly the amount of debt financing they had accumulated mainly during the seventies. Moreover, the debt-to-capital ratio illustrated in figure 1 might overestimate the financing through debt by private

corporations, because State-owned enterprises are included. They detain a high proportion of productive activities in Italy and are usually more leveraged (as well as more subsidized by the government) than private companies.

The rest of Figure 1 shows one of the most characteristic features of the Italian financial system -in relation to the financing of real investment. It concerns the almost negligible role of debenture financing (8.3 percent of total debt) and, on the other hand, the huge and complex structure of debt financing through the banking system. Far more important than bank borrowing is the financing through the Special Credit Institutions (76.4 percent of total financing through financial intermediaries). These are institutions specialized in medium-long term lending operations and in charge of granting subsidized loans. Their liabilities are mainly held by the commercial banks<sup>16</sup> giving rise to a well known phenomenon, usually called in Italy "double intermediation", which developed mainly during the seventies. Even though this particular channel of investment financing has lost importance in the eighties, it still remains the chief form of debt finance.

Clearly illustrated within Figure 1 is another particular feature of the Italian financial markets. Namely, the still very limited role played by institutional investors, such as investment funds, insurance companies, pension funds, etc. that started operating actively long ago in many other countries. Pension funds do not even appear in Figure 1. The reasons for this are various. Certainly, the wide insurance schemes provided by the public sector (both for pensions and health care) helps to explain the modest role played in Italy by private insurance companies. These investors moreover have been traditionally



engaged in the real estate market, as a consequence also of legal constraints on their portfolio investment. Only recently (with the law n.742 of 1986) have these constraints been removed. Finally, as it has been recently underlined (Caranza, 1986) "among the causes of the missing innovations" there are "the delays with which some sectors of financial activity have been regulated" (p.35). Investment funds were allowed to operate in 1983, more than 20 years after the first bill was discussed in Parliament. Pension funds, as well as merchant banking, venture capital, closed-end investment funds have not been properly regulated yet.

#### 1.5 The tax treatment of savings channeled into companies.

Notwithstanding the still limited development of the Italian capital market the discriminations induced by the tax system among different sources and different channels of investment financing are numerous.

Consider first of all an individual investor. Table 1 summarizes, for this investor, the tax treatment of dividends, capital gains and interest income in force in Italy in 1974, 1980 and 1985.

Dividends are conspicuous in being the only form of income earned on financial assets included in the tax base of the personal progressive income tax (Irpef). However, as we said in section 1.1, as from the end of the seventies dividends receive a tax credit.

In general, individuals are not taxed on capital gains. This occurs because according to Italian tax law capital gains are liable to income tax only when arising from "transactions undertaken with a speculative intent". But apart from some

specific cases, inherently regarded as speculative<sup>17</sup>, the tax law does not specify any objective criteria (such as the holding period of an asset) on the basis of which the "speculative intent" may be demonstrated. It is the Tax Administration that must provide the necessary evidence. This means in practice that capital gains realized by an individual investor may easily elude tax payments. The large increase in stock prices which occurred in 1985 and 1986 stimulated much discussion on the opportunity of taxing capital gains. Recently, even the Governor of the Bank of Italy has argued in favour of abolishing the tax exemption on this form of capital income<sup>18</sup>. Despite such authoritative suggestions, the legislation that will be enacted with the "Testo Unico" of direct taxation moves in the completely opposite direction. No more mention is made of the concept of "speculative intent". And with the exception of the few cases already listed in the present legislation, capital gains are indisputably and explicitly regarded as tax-exempt when realized by an individual investor. Rather than closing the debate this new legislation has in a sense opened it up again. Capital gain taxation remains a controversial issue in Italy.

Also the tax treatment of interest income is particularly favourable to individuals. Interest income is not included in the personal income tax base, but is liable (with the exception of government bonds up until September 1986) to final withholding taxes. Statutory rates have not usually been very high, ranging from 10 to 30 percent in the period 1974-85. As can be seen from Table 1, changes have been frequent. The tax reform of the early seventies introduced a very unequal treatment, favouring the financing of firms through financial intermediaries (both banks and Special Credit Institutions) rather than by the direct issue

of debenture loan stock. Gradually these inequalities have been substantially reduced and the tax convenience of borrowing from the credit institutions abolished. At present a uniform tax of 12.5 percent is levied on interest income from bonds, including government bonds as from September 1987. For interest earned on bank deposits the withholding tax is set at a rate of 25 percent.

The tax treatment of interest income, capital gains and dividends received by a household through the intermediation of an investment fund differs from the one illustrated in Table 1 in two major aspects. In the first place, because investment funds are not entitled to receive the dividend tax credit. The flat-rate withholding tax of 10 percent levied at source when dividends are distributed represents in this case, however, a final tax payment. In the second place, because investment funds are liable to a wealth tax levied on net worth at a rate of 0.25 percent. If the portfolio of the fund consists of no less than 55 percent shares (or convertible loans stock) of Italian industrial companies the wealth tax rate is reduced to 0.10 percent.

The tax treatment is more favourable as regards savings channeled into corporations through the intermediation of an insurance company. In the case of a life-insurance policy the following provisions interact:

(a) the individual saver may deduct (within the limit of 2.5 million liras) the premium paid to the insurance company from the personal income tax base;

(b) until October 1985 proceeds were tax free to the policy holder. Since then a final flat-rate withholding tax of 12.5 percent is deducted at source on the difference between benefits and paid-in premiums;

(d) insurance companies are basically taxed like other

corporations. But they are allowed to deduct from their tax base the reserves set aside against the premiums paid by the policy-holder;

(e) interest income, capital gains and dividends received by insurance companies are all included in taxable income. Dividends however receive tax credit. Again a tax credit (equal to 10 percent) is given on the receipts earned by the insurance company from the participation in an investment fund.

## 2. The methodology for computing effective marginal tax rates.

To bring together and evaluate the incentive effects of the tax provisions described in section 1 we compute effective marginal tax rates on a set of 81 hypothetical marginal investment projects following the approach elaborated by King and Fullerton in 1984<sup>19</sup>.

The calculations are made for two years: 1980 and 1985.

Each investment project is described using a particular combination of the following characteristics:

-assets: machinery (including vehicles), buildings, inventories;

-industries: manufacturing, other industry (including transportation, communication and construction), commerce (including nonfinancial private services and distribution);

-sources of finance: debt, new share issues, retained earnings;

-ownership categories: households, investment funds, insurance companies.

The latter disaggregation differs from the one suggested in King and Fullerton (1984). As should be clear from section 1.4

we do not consider pension funds (or more generally tax-exempt institutions) among the ownership categories whereas we separate investment funds from households, because of the different tax treatment.

### 2.1 The model.

In this section we describe briefly how the King and Fullerton's model (1984) has been applied to the Italian case.

It is well known that the basic assumption for computing marginal tax rates on capital use is a profit-maximizing firm. Consider an investment project with an initial cost of one currency unit. The net cost (C) is the purchase price minus the present discounted value (A) of grants and allowances given for the project:

$$(1) \quad C = 1 - A$$

Several provisions described in the previous section affect the value of A and therefore the true cost of the investment project. To take into account these provisions the expression for A is given by:

$$(2) \quad A = f_1 \tau A_z + f_2 g + f_3 k$$

where  $A_z$  is the present value of depreciation allowances on one unit of investment ( $\tau A_z$  is the corresponding tax saving due to these deductibilities);  $g$  is an average rate of cash grants;  $k$  is the rate of the investment tax credit granted against the Value Added Tax. The corresponding proportions of the project entitled to each of these provisions are defined by  $f_1, f_2, f_3$ . For example,  $f_1$  equals unity for a marginal investment in machinery and buildings because the entire initial cost of these assets qualifies for depreciation allowances in Italy. On the other

hand,  $f_1$  equals zero for an investment in inventories in so far as this asset is not entitled to depreciation allowances.

The expression for  $A_z$  is :

$$(3) A_z = (1/L+0.15) + \int_0^2 (1/L+0.15) e^{-\rho u} du + \int_2^n (1/L) e^{-\rho u} du$$

where:  $1/L$  is the rate of depreciation; 0.15 is the additional percentage of the cost of the asset that can be deducted during the first three years (including the year of acquisition) as accelerated depreciation;  $\rho$  is the discount rate in nominal terms used by the firm. The value of  $n$  is:

$$(4) n = 0.55L - 1$$

which is obtained by equating the undiscounted sum of all allowances to the acquisition cost of the asset.

The present discounted value of the profits of the project is:

$$(5) V = \int_0^{\infty} (1-\tau)(p+\delta) e^{-(\rho+\delta-\pi)u} du$$

where  $\tau$  is the statutory corporate tax rate,  $p$  is the pre-tax real rate of return net of depreciation,  $\delta$  is the (exponential) rate of economic depreciation,  $\pi$  is the rate of inflation. The variables that define  $V$  and  $C$  are assumed to be constant through time.

In equilibrium, the present value of profits  $V$  must equal the cost of the project  $C$ . Solving equation (5) and using equation (1) to set  $V=C$  the following relation between the pre-tax real rate of return ( $p$ ) and the firm's nominal discount rate ( $\rho$ ) is obtained:

$$(6) p = \frac{(1-A)(\rho + \delta - \pi)}{(1-\tau)} - \delta$$

The next step in computing marginal total effective tax rates

is to relate the discount rate ( $\rho$ ) to the nominal interest rate ( $i$ ) and to the real after-tax rate of return to the saver ( $s$ ).

The relationship between these rates depends on the tax treatment of the different sources and channels through which the project is financed.

Assume first that individuals, by adjusting their portfolios, arbitrage away differences in the net rates of return which they can receive on different financial assets. Under this assumption the discount rate varies with the financial policy and the ownership structure of the firm. It depends also crucially on the investor's opportunity cost, that is to say on the rate of return the potential investor in the firm's financial assets may earn on an alternative investment.

In Italy, during the eighties, the rate of return on tax-exempt government bonds has been on average higher than the rate of return on alternative financial assets<sup>20</sup>. It has been an explicit target of the policy makers to reduce the monetary financing of the Public Sector budget deficit, and to favour the acquisition of government bonds by private savers. As a consequence of this policy the share of government bonds in the total financial wealth of households increased from 3.2 percent to 26.8 percent between 1975 and 1985 (see *Bollettino Economico*, October 1986, p. 12\*).

Because of this institutional environment (and given the assumptions of certainty, perfect information, etc. on which the computation of effective marginal tax rates is based) the opportunity cost of the potential investor in the firm may be defined as the nominal before-tax interest rate  $i$ , i.e. the rate of return he could hypothetically earn (in 1980 and 1985) by investing money in tax-exempt government bonds<sup>21</sup>.

On this basis the firm's discount rate  $\rho$  -contained in equation (6)- may be defined separately for each source of finance in the following way.

a) When financing through debt, the following provisions interact:

-the company may deduct nominal interest payments against the corporate tax base at a rate  $\alpha$  ( $0 \leq \alpha \leq 1$ );

-nominal interest income paid by the company to the saver is taxed at a rate which is denoted by  $m_b$ ;

-the market interest rate is on average reduced by a proportion  $\beta$  owing to the presence of subsidized interest rate loans.

Taking into account all these provisions the discount rate for the firm is:

$$(7) \quad \text{Debt finance:} \quad \rho = \frac{i (1-\beta) (1-\alpha\tau)}{(1-m_b)}$$

b) In the case of new share issues the net of tax dividend yield for the investor is  $\rho\theta(1-m_d)$ , where  $m_d$  is the investor's marginal tax rate on dividend and  $\theta$  is the gross dividend shareholders could receive if the company distributed one unit of post-corporate-tax earnings<sup>22</sup>. Under the Italian imputation system  $\theta=1+c$ , where  $c$  is the per unit dividend tax credit. The discount rate for the firm is:

$$(8) \quad \text{New share issues:} \quad \rho = \frac{i}{\theta (1-m_d)}$$

c) Finally, if the financing at the margin occurs through retained earnings the discount rate is:



$$(9) \quad \text{Retained earnings:} \quad \rho = \frac{i}{(1 - z)}$$

where  $z$  is the effective tax rate on accrued capital gains.

As a consequence of the assumption used in equations (7)-(9) to derive the firm's discount rate for each source of finance, the post-tax real rate of return to the saver(s) does not in general diverge from the real interest rate ( $r=i-\pi$ ), except when the investor who supplies the finance to the firm is an investment fund. In this case as we have seen there is a wealth tax. Denoting by  $w_p$  the rate at which this tax is levied, the net-of-tax real rate of return is:

$$(10) \quad s = i - \pi - w_p$$

We use equations (1)-(10), and the institutional details of tax legislation to compute effective marginal tax rates on income from capital in Italy.

On the basis of an exogenously given real rate of interest ( $r$ ) we compute the post-tax real rate of return to the saver ( $s$ ) and the minimum pre-tax rate of return ( $p$ ) each project must yield to provide the saver with the fixed real rate of interest ( $r$ ). The marginal effective tax rate on each project is obtained by adopting the usual notion of a tax-inclusive rate, i.e. dividing the tax wedge ( $p-s$ ) by the pre-tax rate of return ( $p$ ):

$$(11) \quad t = \frac{p - s}{p}$$

The above described procedure for calculating effective tax rates may certainly be questioned on many grounds. It is based on the extreme assumption that individuals adjust their portfolios to eliminate any tax differential between the tax-free return on government bonds and the rate of return on the securities of the

company. Moreover, as is well known, to allow for the possibility of arbitrage at the individual level implies the existence of unused opportunities for firms to earn arbitrage profits. This is quite difficult to justify.

For these reasons effective marginal tax rates are computed also by applying an alternative procedure. Rather than choosing among other specific assumptions concerning capital market equilibrium, however, this alternative procedure assumes a fixed value (common to each project) for the pre-tax rate of return ( $p$ ) and uses equations (1)-(10) to work out the maximum net-of-tax return to the saver ( $s$ ) that the project could sustain. The effective tax rate is again computed using (11).

Following King and Fullerton these two alternative approaches for computing marginal effective tax rates will be called "fixed- $r$ " and "fixed- $p$ " cases respectively.

The results obtained for 1980 and 1985 assuming alternatively a fixed pre-tax rate of return  $p$  on each investment project equal to 10 percent and a fixed net-of-income-tax real rate of return  $r$  to the saver equal to 5 percent are discussed in sections 3.1 and 3.2 respectively.

Computations are made under the assumption that firms have enough taxable profit to claim all the allowances to which they are entitled in the marginal investment project. (We recall that in Italy tax losses are not refunded and can be carried forward only for five years).

Moreover we assume that firms minimize their taxes by making full use of accelerated depreciation, tax credits, etc.. Similarly, equations (1)-(11) are based on the assumption that firms use Lifo inventory accounting.

Finally we notice that the assumption made in equation (3)

-which calculates the present discounted value of depreciation allowances- may introduce an upward bias to our estimates of effective tax rates. We assumed that deductions are allowed at the historical cost of acquisition. As we have seen, however, on several occasions firms have been allowed to reevaluate ex-post their assets. Were this to affect the expectations of the firm, the present discounted value of depreciation allowances would be higher (for a positive rate of inflation) than if computed under the assumption of historical cost accounting principles, and the effective marginal tax rates lower.

## 2.2. Estimates of the parameters.

In this section we describe briefly the method, the sources and the simplifying assumptions used to compute the numerical values for the variables contained in equations (1)-(11). Most of these values (which are calculated for 1980 and 1985) differ according to industry, asset, category of owner and are derived directly from the institutional details of legislation.

We describe first (section 2.2.1): the corporate tax rate ( $\tau$ ), the opportunity cost of retained earnings ( $\theta$ ), the rate of deductibility of interest payments ( $\alpha$ ), the average marginal tax rates (for each final owner) on: dividends ( $m_d$ ), capital gains ( $z$ ), wealth ( $w_p$ ) and interest income ( $m_b$ ).

Subsequently (section 2.2.2) we describe the remaining parameters varying according to our asset-industry classification. They are: the rates of depreciation for tax purposes ( $1/L$ ), the (exponential) rates of economic depreciation ( $\delta$ ), the proportion of interest rate reduction due to subsidized loans ( $\beta$ ), the rate of cash grants and Value Added Tax credit ( $g$  and  $k$ ), the proportion of investment entitled to these incentives

( $f_2$  and  $f_3$ ).

### 2.2.1 Corporate and personal tax rates.

The computed values for the parameters discussed in this section are shown in Table 2.

Corporate Tax Rate. Since the local income tax (Ilor) is deductible against the corporate tax base (Irpeg), the value of the statutory tax rate  $\tau$  is given by:

$$\tau = t_1 + t_s(1 - t_1)$$

where  $t_1$  is the local income tax rate (Ilor) and  $t_s$  is the corporate income tax rate (Irpeg). These rates were 15 percent and 25 percent in 1980 and 16.2 and 36 percent in 1985. Thus the value of  $\tau$  is 0.3625 and 0.46368 in 1980 and 1985 respectively.

Rate of Deductibility of Interest Payments. It is very difficult to translate the effects of the complex legislation on the interest payments deductibility mentioned in section 1.1 into a rate of interest payment deductibility ( $\alpha$ ) suitable for our purposes. Both in 1980 and in 1985 in fact the value of  $\alpha$  was different from firm to firm, depending on the composition of the economic account. In order to compute effective marginal tax rates the assumption was made that interest payments were fully deductible from the corporate tax base ( $\alpha=1$ ). Under the 1985 law, for example, this implies that the firm undertaking the investment project had a greater volume of interest payments than of tax-exempt receipts<sup>23</sup>. In general it may be said that this simplifying assumption tends to bias downwards the measure of effective tax rates.

Tax Credit on Dividend. The variable  $\theta$ , which depends on the degree of integration between corporate and personal taxation, is equal to  $1/(1-t_s)$ , because of a dividend tax

credit that compensates for the corporate but not for the local income tax paid by the company.

Tax Rates on Dividend Income. For an individual shareholder the average marginal tax rate on dividend income was computed as a weighted average of the marginal statutory tax rates with weights given by the distribution of dividend income in the various tax brackets<sup>24</sup>. In 1985 the structure of the personal progressive income tax was notably different from that of 1980. Instead of 32 tax brackets with statutory marginal tax rates ranging from 10 to 72 percent, in 1985 there were only 9 bands of taxable income with rates ranging from 18 to 65 percent. According to our estimates the average marginal tax rate on dividend in the household sector was 43.53 percent in 1980 and 42.46 percent in 1985.

The latter figure turned out to be almost equal to the flat-rate according to which dividend income received by an investment fund is taxed. As we said, investment funds are not entitled to the dividend tax credit. Dividend income received by these shareholders is therefore liable to corporation income tax (at a rate of 36 percent) and dividend withholding tax (levied at a rate of 10 percent). The total tax burden is 42.4 percent, i.e.  $0.36+0.10(1-0.36)$ .

The taxation of dividend received through the intermediation of an insurance company is more complex. The average marginal effective tax rate on dividend income was obtained by weighting the following rates computed separately for damage-insurance and life-insurance companies<sup>25</sup>:

Damage-insurance companies:  $t_s(1-\gamma)$

Life-insurance companies: 
$$\frac{t_s(1-\gamma)+t_y(1-t_s(1-\gamma)) - t_p}{(1-t_p)}$$

where:

-  $\gamma$  is the rate of deductibility of reserves (set aside against the premiums paid by the insured) allowed by tax legislation from the corporate tax base of insurance companies. The available data did not allow a proper estimate of this parameter. In our standard calculations we assumed  $\gamma=0.82$  on the basis of the observed ratio between reserves and total investment of the major insurance companies operating in Italy<sup>26</sup>. In section 3.1, however, the effect of a different assumption concerning this parameter will be investigated;

-  $t_y$  is the tax rate deducted at source on the difference between benefits and paid-in-premiums. As we said this tax was introduced in October 1985 at a rate of 12.5 percent. This gives  $t_y$  a value equal to zero in 1980. For 1985 we assumed  $t_y=0.03125$  ( $0.125/4$ );

-  $t_p$  is an average marginal tax rate obtained by weighting the statutory rates of the progressive personal income tax (Irpef) with weights given by the distribution of premiums deductible against personal income tax. The method employed is the same used to estimate the households average marginal tax rate on dividend income. Our calculations show a value of  $t_p$  equal to 26.78 percent in 1980 and 25.03 percent in 1985.

For damage-insurance companies the effective tax rate is easy to explain. We took into account: the deductibility of additional reserves; the fact that dividend income is not liable to local income tax (Ilor), but is liable to corporate income tax (Irpeg); the fact that proceeds (in the form of compensation for damages) are tax-free to the beneficiaries.

The expression used to compute the effective tax rate on dividend for a life-insurance company may be explained in the

following way. For a unit value before-tax return received by the insurance company, the policy-holder receives a post-tax return of  $(1-t_e)(1-t_y)$ , where  $t_e$  is the effective tax rate paid by the insurance company (equal to that computed for the damage-insurance branch), and  $t_y$  is the tax rate levied on the receipts accruing to the policy-holder. As we said, premiums paid to life-insurance companies are deductible against the personal income tax base. Ignoring the limits set by tax legislation on these deductions, the effective acquisition cost for the policy-holder is  $(1-t_p)$ . Hence, his net-of-tax return is:

$$\frac{(1-t_e)(1-t_y)}{(1-t_p)}$$

The effective tax rate for life-insurance was computed by dividing the tax wedge between the pre-tax receipts of the insurance company and the post-tax receipts of the policy-holder, by the pre-tax return.

Tax Rate on Capital Gains and Wealth. For both households and investment funds we assumed that capital gains are not taxed. For an individual investor the reason for this assumption should be clear from what we said in section 1.4. As far as investment funds are concerned we may notice that there was a fairly intensive debate on the issue when the law allowing investment funds to operate in Italy was under discussion in Parliament. In the end, however, the authorities decided on a wealth tax. As we said, there are two rates, the lower being intended to favour the acquisition of industrial shares in the portfolio of the fund. Despite this incentive, the proportion of shares was only about 26 percent of the overall portfolio of investment funds at the end of 1985, whereas government bonds counted for about 60 percent of the total. We assumed therefore that investment funds

pay the higher rate of wealth tax ( $w_p=0.25$  percent).

Capital gains are included in the taxable base of insurance companies. The effective tax rate was computed using the same approach as described for the taxation of dividend. The only difference is that capital gains are liable to local income tax (as well as to corporate income tax) whereas dividends are not. The resulting effective tax rate on realized capital gain<sup>27</sup> was converted into an effective accrued tax rate ( $z$ ) -used to define the discount rate when the source of finance is "retained earnings"- following the approach suggested in King and Fullerton (1984, p.23).

Tax rates on interest income. Difficulties arise in the estimation of average marginal tax rates on interest income for two reasons: the variety of statutory tax rates, and the over-intermediation that still characterizes the Italian financial market.

The latter problem is frequently treated in a fairly simplified manner when computing marginal tax rates. King and Fullerton assume "that the banking system acts as a competitive financial intermediary and that, at the margin, it earns no monopoly profits on its interest receipts. Hence, the only taxes we assume are collected on interest receipts in connection with corporate borrowing from banks are personal taxes levied on investors' interest income" (p.28). In the Italian institutional environment, however, even when accepting the first assumption put forward by King and Fullerton, the second does not follow. This derives directly from the tax legislation on interest payment deductibility mentioned in section 1.1. Because of this legislation, in fact, the tax paid by a bank on a marginal addition to taxable income does not match exactly the tax saving



due to a corresponding deduction of interest payments. On the one hand, an addition to taxable income is taxed at less than the statutory rate, because it increases the rate of deductibility of interest payments (which is a function of both taxable and tax-exempt receipts). On the other hand, the tax saving due to a marginal increase in interest payment is less than the statutory rate, because the rate at which interest payments can be deducted against the corporate tax base ( $\alpha$ ) is less than one.

Effective marginal tax rates on taxable income of the banking system have been estimated in a recent study (Di Majo and Franco, 1987b)<sup>28</sup>, which uses aggregate data for the economic accounts of commercial banks in the period 1975-85. According to these estimates the effective tax rate on taxable income was 32.13 percent in 1980 and 40.42 percent in 1985. (It is worth recalling that the corresponding statutory rates in these years were 36.25 percent and 46.37 percent respectively). The same study provides estimates for the rate of deductibility of interest payments. It was 0.876 in 1980 and 0.853 in 1985. Combining these pieces of information we computed a "banking system marginal effective tax rate" or, more precisely, a tax rate levied at the margin on the banking system while still maintaining the assumption that these intermediaries act competitively.

In the case of intermediation through a Special Credit Institution another aspect of the legislation must be taken into account. Whereas short term loans are untaxed, medium-long term loans (over 18 months) are subject in Italy to a tax (the so-called "imposta sostitutiva") levied in substitution of some indirect taxes. The taxable base is the amount of the loan. The tax rate was 1.5 percent in 1980 and 2.5 percent in 1985.

It is difficult to include this form of taxation in marginal

effective tax rate calculations. As has been demonstrated (Mieli, 1984) the burden of this tax, expressed in terms of higher interest rate for the firm contracting the loan, is a function of both the rate of interest and the length of the loan. For a loan of infinite length the tax rate (expressed again in terms of rates of returns) reaches a minimum that coincides with the statutory rate. We used this assumption to incorporate the effects of this tax into the computation of effective tax rates on interest income. By so doing, we obviously underestimate the burden of this tax. It must be remembered however that this tax may be (and in fact is) widely eluded by reducing the length of the loans.

In addition to these taxes, collected when the intermediation occurs through the banking system, we obviously considered the taxation of interest income received (on deposits and bonds) by households, investment funds, and insurance companies. The statutory tax rates for households and investment funds are those already shown in Table 1 (discussed in section 1.4). For insurance companies we used the same sort of calculation employed to estimate the tax rate on realized capital gains.

Table 3 illustrates the last step made in computing average marginal tax rates on interest income. In this table an effective tax rate is shown for each of the major channels of firm financing through debt and for each owner included in our classification. Data refer to 1980 and to 1985. Each of these rates incorporates all the provisions previously described.

The low tax rate observed in 1980 in the case of financing through Special Credit Institutions whose securities are directly held by a household (6.4 percent) is explained by the tax exemption these securities were temporarily granted as from July

1980. It can be seen from Table 3 that the same exemption disappears when the owner is a commercial bank. This is due to the effects of the tax legislation restricting interest payment deductibility.

The wide variations (among channels of debt finance) in the effective tax rates computed for insurance companies are mainly due to the different portfolio composition of the damage and life-insurance branches.

Along with these rates Table 3 shows the proportional shares of the different sources of debt financing. These weights (obtained from Figure 1) were used to aggregate the various marginal effective tax rates separately for each ownership group. The estimated average effective tax rates on interest income ( $m_b$ ) finally used to compute effective marginal tax rates are: 17.17 percent and 22.68 percent respectively in 1980 and 1985 for households; 3.38 and -1.57 percent in the same two years for insurance companies; 13.99 (in 1985) for investment funds.

#### 2.2.2 Specific asset-industry parameters.

Table 4 assembles the computed values for the parameters described in this section.

Depreciation rates for tax purposes. The average depreciation rates ( $1/L$ ) shown in Table 4 were estimated by aggregation of the numerous rates laid down for different assets and industries by the tax authorities. Where possible we used capital stock weights<sup>29</sup>. Disaggregated investment data for 1982<sup>30</sup> were used mainly to obtain industry specific depreciation rates for machinery (excluding vehicles). In this case tax law distinguishes between several specific assets. Rates, moreover are highly variable ranging from 7.5 to 40

percent.

Because of the different asset-industry classifications used in national accounts vis-a-vis tax legislation, the average depreciation rates shown in Table 4 are far from representing precise estimates. Nevertheless our calculations show that the average depreciation rates for machinery is higher (about 14 percent in the industrial sector) than generally assumed (10 percent)<sup>31</sup>.

Economic Depreciation Rates. There is an enormous lack of studies in Italy on the economic lives of capital assets. As we anticipated, estimates of capital stocks as well as of depreciation in national accounts are usually made on the assumption of straight-line depreciation. The most frequently assumed average lifetimes are, for the industrial sector (see Rosa, 1979; Rosa, Siesto, 1985): 10 years for vehicles and, depending on specific industrial branches, from 15 to 20 years in the case of machinery and from 30 to 40 years in the case of buildings. Similar assumptions have been recently employed (Heimler, 1985) to make estimates of gross capital stocks in other (non industrial) sectors of the economy.

We used the above information to estimate the values for  $\delta$  shown in Table 4. The straight-line rates of depreciation for each specific industrial branch were transformed into equivalent rates of exponential depreciation using the approach suggested in King and Fullerton (p.29). Subsequently the exponential rates were aggregated for the different industries in our classification by using capital stock weights.

Subsidized Interest Rate Loans. The average percentage reduction of the market interest rate due to the presence of subsidized interest rate loans ( $\beta$ ) was computed, separately for

each sector, by weighting the difference (expressed in percentage terms) between non-subsidized and subsidized interest rates with the relative share of subsidized loans over total debt financing. Only in the latter case was a distinction between sectors possible, using the financial statistics of the Bank of Italy. In the period 1980-85 the average share of subsidized loans (excluding those for export) in the total loans by Special Credit Institutions was: 18.9 percent for manufacturing, 3.7 percent for other industries and 2.7 percent in the commercial sector. These data, combined with those illustrated in Figure 1 (concerning the structure of firm financing) were used to compute the proportion of subsidized loans in total debt financing.

Even though inventories are sometimes entitled to this incentive we did not consider this possibility.

Cash Grants. As with the previously discussed incentive, it was again impossible in the case of cash grants to provide estimates directly from the details of legislation. We limited our attention to the cash transfers granted by the "Cassa per il Mezzogiorno" (the development agency for the South). They still constitute one of the most important and generalized investment incentives granted to firms in Italy (even though limited to specific areas of the countries). Following an approach already used in other studies<sup>32</sup>, the average rate of grant  $g$  was estimated respectively for 1980 and 1985 by dividing the total value of the grant in each of these years by the appropriate corresponding figure for investment expenditure one year later<sup>33</sup>. The rate of grant was computed at a national level. Therefore  $f_2$  (the proportion of investment qualifying for cash grants) is equal unity for those assets and sectors (machinery and building in manufacturing) that benefit from this investment

incentive. Data were not available to compute the average rate of grants separately for machinery and buildings.

Cash grants do not decrease the asset depreciation base and are not included in taxable income for firms.

Value Added Tax Credit. This investment incentive was included in the computation of marginal effective tax rates only for 1980. In 1985 the value added tax credit was granted only on investment expenditure in high-technology machinery made by small and medium-sized firms.

In 1980 the rate of tax credit ( $k$ ) was 4 percent of the investment expenditure. Only the investment on machinery and buildings undertaken by manufacturing industries in the South was eligible. The proportion of qualifying investment ( $f_3$ ) was therefore computed using the investment share in the South<sup>34</sup>. Once again the available statistical information did not allow us to make separate estimates for our asset classification.

### 3. Estimates of effective marginal tax rates.

#### 3.1 Marginal tax rates with constant pre-tax rate of return.

The model and the data described in the previous section may be used to compute effective marginal tax rates on income from capital in 1980 and 1985 for any given combination of asset, industry, source of finance and category of owner which characterizes the hypothetical investment projects considered in this study.

In Appendix A we show the full set of these rates. They have been calculated assuming a fixed pre-tax real rate of return of 10 percent on each investment project and two different rates

of inflation: zero and the actual annual average rate in the period 1980-85 (15 percent).

In Table 5 the same data -computed for the following rates of inflation: zero, 5, 10 and 15 percent-, have been aggregated for each subset of combinations (namely, for each of the three assets, industries, sources of finance and final investors). The last row of the Table shows the overall mean marginal tax rate, which is a weighted average of all the individual rates and is an aggregate statistic of the tax wedge between the return to investment and the return to saving in the corporate sector.

The weights employed to compute these average marginal tax rates are shown in Table 6. They concern: the distribution of net capital stock (at replacement cost) among assets and industries, the average proportion of corporate financing through debt, new share issues and retained earnings, and the pattern of debt and equity ownership by category of investor.

Several difficulties arose in computing these numerical values and in using them to aggregate individual effective tax rates. Some problems are related to the lack of statistical data<sup>35</sup>. Others, concerning mainly the proportion of the different sources of finance and the distribution of debt and equity by category of owner, are due to the wide modifications of these parameters, which have been observed in Italy during the eighties.

As it has been recently underlined in a Report presented by a Commission appointed by the Treasury on "Financial Wealth, Public Debt and Monetary Policy" (Ministero del Tesoro, 1987): "the problem of the modification of the parameters is particularly troublesome in the case of the financial sector of the economy,

on account of the changes characterizing this sector. It would be ill-advised to use estimates of the parameters derived from a financial structure that has shown a considerable evolution in the recent past and extrapolate them to specify, in quantitative terms, the financial structure that will prevail in the future" (p.33).

In the case of final ownership categories we used different weights for 1980 and 1985, in order to calculate average marginal tax rates in each of these years. The reason, as we said, is that investment funds were allowed to operate in Italy only in 1983. Even though households remain in 1985 by far the most important final investor (the relative importance of investment funds and insurance companies being very limited) it should be borne in mind, in comparing the results for 1980 and 1985, that changes of effective tax rates depend on the modification of weights as well as on the changes in the tax parameters.

As far as the proportion of financing (at the margin) through debt, new share issues and retained earnings is concerned, the impossibility of estimating a satisfying set of weights (see also the discussion in section 1.4) led us to make alternative assumptions. We shall investigate three cases, which differ mainly in the proportion of investment that is financed through debt. These alternative cases may be called: "low", "medium" and "high" debt-to-capital ratio cases. The weights shown in Table 6 and used to compute the average marginal tax rates of Table 5 refer to the intermediate case and are: 0.555 for debt financing, 0.192 for new share issues, 0.253 for retained earnings.

In table 7 average marginal tax rates are computed assuming a "low" debt-to-capital ratio. The weights employed are: 0.215 for debt, 0.195 for new share issues and 0.590 for retained earnings.



Finally, the weights used to aggregate effective marginal tax rates shown in Table 8 refer to the "high" debt-to-capital ratio case. We assumed, in this case, that the proportion of debt finance is 0.751, whereas 0.108 and 0.141 are respectively the proportion of financing through new share issues and retained earnings.

Even though all these data were obtained from empirical evidence<sup>36</sup>, these three cases are mainly meant to investigate the effects on marginal tax rates of three alternative plausible assumptions about the proportion of debt and equity capital used by firms in Italy for financing a marginal investment.

The average tax rates calculated under each of these assumptions are obviously very different because of the high subsidy provided by the tax system to debt vis-a-vis equity financing. For the zero inflation case, the overall tax rate is in 1985: 0.8 percent for the "medium" debt-to-capital ratio case (see Table 5), and respectively 14.2 and -7.4 percent in the "low" and "high" debt-to-capital ratio alternatives (see Table 7 and 8). In general, however, it is possible to say that the Italian tax system is on average much more favourable than a comprehensive income tax system (which would imply an effective tax rate equal to the marginal personal income tax rate). In the "medium" debt-to-capital ratio case it is actually close to an expenditure tax system (under which, as it is well known, the tax wedge between the return to investment and the return to saving is zero). Unlike these alternative tax systems, however, the present system of taxation of income from capital in Italy produces a very high dispersion of effective marginal tax rates around the average.

Let us consider the results illustrated for 1980 and 1985 in

the first two columns of Table 5, for the zero inflation case. (Similar qualitative considerations may be made on the basis of the data shown in Tables 7 and 8).

The breakdown by asset shows that investments in inventories bear the highest tax burden (around 30 percent both in 1980 and 1985), whereas machinery is subsidized (the tax rates are -9.8 and -20.1 percent in 1980 and 1985 respectively). The main reason for these disparities is the generosity of the depreciation allowances granted by the Italian tax law on fixed investment, and mainly on machinery. The concentration of incentives (cash grants, "negative V.A.T.", subsidized loans) on investment in machinery and buildings rather than in inventories are also responsible for these results.

The differences in effective tax rates among the industry groups are explained by the different composition of the capital stocks, and again by the distribution of incentives that favoured manufacturing in the period 1980-85. In this sector the tax rate is close to zero in 1980 and becomes a subsidy in 1985. The highest tax rate (largely below 10 percent, however) is borne by the commercial sector.

As anticipated, the differences are considerable when looking at the breakdown by source of finance and category of owner. Debt is highly subsidized (the tax rate is -12.2 percent in 1980 and -17.8 percent in 1985), whereas new share issues constitute the most heavily taxed source of finance (+37.4 and +26.9 percent in 1980 and 1985 respectively), despite the imputation system introduced in 1977. These disparities are easily explained by recalling the following aspects of the Italian tax system:

(a) the average effective tax rates on interest income paid

by category of owner are much lower than the rate at which corporations may deduct interest payments from the tax base. For instance, both in 1980 and in 1985 the household tax rate on interest income is less than half the statutory rate levied on corporations (in 1985 the former is 22.68 percent, whereas the latter is 46.37 percent);

(b) dividends usually receive a tax credit, but are included, in the case of an individual shareholder, in the tax base of the personal progressive income tax (Irpef). Combined with the local income tax (Ilor) the total burden is close to 52 percent both in 1980 and in 1985;

(c) retained earnings are liable to Irpeg and Ilor: the nominal tax rate is 36.25 percent in 1980 and 46.37 percent in 1985.

The disparities of tax rates found within sources of finance is enhanced by the presence of subsidized loans: without this incentive the subsidy to debt would decrease by more than 3 percentage points in each year considered.

There are also notable differences in the effective tax rate for different categories of investor. The savings channeled to companies through the intermediation of an insurance company are highly subsidized (-37 percent in 1980 and -23 percent in 1985). This result depends crucially on the assumption about the proportion of premiums which are collected and set aside as a reserve that the insurance company may deduct from taxable income. To compute the results discussed in this section we assumed, on the basis of a rough estimate (see section 2.2.1), that this proportion was 0.82. Using a lower parameter, e.g. 0.5, the subsidy for insurance companies decreases noticeably (-24.5 and -5.5 percent in 1980 and 1985 respectively) but does

not disappear. The overall tax rates moreover do not change greatly as a consequence of these different assumptions (they would be in fact 4.8 percent in 1980 and 1.5 percent in 1985), because of the still relatively low weight of this investor in the financing of the business sector.

Another interesting result of our analysis is the decline in the overall marginal tax rate observed between 1980 and 1985. The higher the inflation rate is and the bigger the proportion of the marginal investment financed through debt instruments (see Tables 5, 7, and 8) the greater is the decline. This effect is displayed also in Figure 2 and 3, which plot overall effective tax rates in 1980 and 1985 as a function of inflation for the "medium" and "low" debt-to-capital ratio cases.

The major factor responsible for the decline in the overall tax rate between 1980 and 1985 is the increase in the statutory corporation tax rate from 36.25 to 46.37 percent. Had this increase not occurred, the effective tax rates would have actually generally increased (or the subsidy decreased) between the two years considered. This is shown in Table 9 under the assumption that the marginal debt-to-capital ratio is 0.555. For each different rate of inflation considered in this Table we duplicate in the first two columns the results already obtained for 1980 and 1985 using the standard parameters (see Table 5). In the third column results are shown for 1985 assuming that the statutory corporate tax rate (including both *Ilor* and *Irpeg*), and correspondingly the parameter  $\theta$  (which depends on the dividend tax credit) were unchanged with respect to 1980 values<sup>37</sup>. Under this simulation the overall tax rates in 1985 are respectively for each inflation rate (zero, five and ten percent): 6.5, 5.1 and 2.9 percent. These results are somewhat higher than observed for

1980 and much higher than obtained in 1985 using the higher statutory corporate tax rate in force.

This result is brought about by the combined effect of the generosity of tax allowances for depreciation, the deductibility of interest payments and the concession of a tax credit on dividends. Tax allowances for depreciation exceed economic depreciation. The most extreme case is that of a marginal investment in machinery undertaken in manufacturing. For this marginal project the present value of tax allowances and cash grants (namely the value of the parameter  $A$ , which reduces the effective cost of the project) is equal, at a zero inflation rate, to the corporate statutory tax rate. This is precisely what would happen with a cash flow corporation tax, under which however neither should interest payments be deductible, nor dividends receive a tax credit. It is not surprising therefore to observe, on the basis of the Italian tax code, that the increase in the nominal tax rate of corporations decreases the corporate tax wedge, whenever the investment project is financed at the margin with debt or new share issues. Since the increase in personal tax rates was modest between 1980 and 1985 (the most significant change was the increase in the average household tax rate on interest income from 17.17 to 22.68 percent) the reduction in the corporate wedge causes a reduction in the overall effective marginal tax rate (or an increase in the marginal subsidy for investment). Only if the investment project is financed, at the margin, with retained earnings, is the effect of an increase in the statutory tax rate reversed.

From Figure 2 and 3 we can also examine the sensitivity of tax rates to inflation.

For quite a high debt-equity ratio (see Figure 2), the

overall effective tax rate is a decreasing function of inflation, both in 1980 and 1985. The reason is that the tax saving due to the deductibility of nominal interest payments outweighs the additional tax burden caused by the erosion of the real value of depreciation allowances and by the failure to index the personal tax system.

Interestingly, if the marginal investment is financed by a high proportion of equity capital (about 80 percent), the response of tax rates to inflation varies between 1980 and 1985 (see Figure 3). In the first year the overall tax rate increases, even though at a decreasing rate<sup>38</sup> with the increase in the inflation rate. In 1985, on the contrary, the effective tax rate increases at first, for low rates of inflation, but declines soon after. Again as a consequence of the increase in the statutory corporation tax rate, at a rate of inflation slightly higher than 4 percent, the extra benefits of deducing nominal interest payments become relatively more important, and further inflation decreases the overall tax rate.

One of the most important points of this section, well summarized in Figures 2 and 3, is the high sensitivity of marginal effective tax rates to different assumptions about the proportion of the marginal investment financed through debt or equity capital. The overall tax rate seems to be very low even if the investment is financed, at the margin, with a high proportion of equity capital: for an 80 percent equity financed investment the overall effective tax rate does not exceed 20 percent either in 1980 or in 1985. This positive tax, however, decreases and even changes into a subsidy as soon as the debt-to-equity ratio is increased. For high debt-equity ratios and high rates of inflation the subsidy is sizeable: 24 percent for a marginal

investment project financed by slightly more than 50 percent through debt, using the 1985 tax parameters and the actual annual average rate of inflation in the period 1980-85.

Moreover, these average rates (or subsidies) conceal, as we have seen, a wide dispersion of effective tax rates, which is enhanced by the effect of inflation. To provide a clearer picture of this phenomenon we show in Figure 4 for 1980 and 1985, and for two different rates of inflation (zero and 15 percent) the proportion of investment taxed at each rate. This proportion is computed by adding the capital stock weights under the assumption of a debt-to-capital ratio of about one half, for all the individual combinations that are taxed at effective tax rates falling in each 10 percent interval in the range -210 +90. The highest and the lowest tax rates are found in 1980 and 1985 respectively, and under the assumption of a 15 percent inflation rate. The lowest tax rate is the -204 percent rate for debt-financed investment in machinery in the manufacturing sector, where the debt is held by insurance companies. At the other extreme, there is the 89 percent tax rate for an investment in inventories financed with new share issues held by households.

### 3.2. Marginal tax rates with constant after-tax rate of return.

The 1980 and 1985 effective tax rates shown in Table 10 are computed assuming a fixed net of tax interest rate equal to 5 percent on all projects. The results are presented for two different assumptions about the proportion of debt financing (out of the three made in section 3.1) and for two different rates of inflation: zero and 5 percent. For higher rates of inflation the

tax wedge is often negative and very high: the before tax rate of return for the company (which is the denominator in the formula used to compute effective tax rates) approaches zero and even becomes negative. This result prevents, as it is known (see, for instance, Bradford and Fullerton, 1981), any meaningful calculation of a "tax-inclusive" effective tax rate.

As explained in King and Fullerton (1984, p.247), averaged effective tax rates will generally be higher under this assumption than under that of a fixed before-tax rate of return. This is what one can observe when comparing the results shown in Table 10 with the corresponding results illustrated in section 3.1 for the fixed-p case. For instance, in 1985, depending on the proportion of investment financed by debt (respectively 0.555 and 0.215) the overall tax rates are, assuming a rate of inflation of 5 percent, -6.4 and +14.6 percent in the fixed-p case. The corresponding rates computed under the assumption of a fixed net-of-tax real rate of return are: -4.6 and +20.9 percent.

Notwithstanding the different magnitudes in absolute value, the pattern of effective tax rates is the same independently of whether they are computed assuming a fixed before-tax rate of return or a fixed net-of-tax real rate of return to the final saver. All the major qualitative conclusions drawn in section 3.1 are in fact confirmed by the results displayed in Table 10.

### 3.3 The effect of the new accelerated depreciation scheme.

As from 1988 the maximum amount of additional depreciation allowances firms may claim (in the first three years) will be a fixed proportion (1.5) of the statutory depreciation rate (1/L). Moreover, in the first tax period the depreciation rate will be halved. This means that under the new



regime total deductions for depreciation may not exceed the following amounts per unit of investment:  $(1/L*0.5*2.5)$  in the first year and  $(1/L*2.5)$  in the following two periods.

Table 11 shows the effects of this legislation on effective marginal tax rates, using the 1985 standard parameters and under the fixed-p assumption. Comparing these results with those obtained in Tables 5 and 7 (section 3.1) it may be seen that the effect of this tax change is to reduce slightly the subsidy given to a marginal investment in machinery and to increase notably the effective tax rate on buildings. For instance, under the assumption of 5 percent inflation, the effective tax rate on buildings increases from -3.3 to 19.7 percent assuming that the proportion of debt finance is about one half and from 17.7 to 37.4 if the marginal investment is financed by about 80 percent with equity capital.

The effect on machinery is due to the reduction by half of the statutory depreciation rate in the first tax period. The effect on long-lived assets, on the other hand is brought about by the decision to link the amount of additional depreciation to the rate of depreciation itself, rather than to the acquisition cost of the asset.

For higher rates of inflation (see the results shown in Table 11 for a ten percent rate of inflation) buildings turn out to be taxed even more than inventories, under the new legislation which will be enacted with the "Testo Unico". This occurs because inventories may be valued using the Lifo accounting system, whereas fixed assets are allowed to depreciate at historical costs.

Since buildings are approximately one third of total capital

stocks, the increase by about 20 percentage points in the effective tax rate on this asset produces an increase in the overall tax rate of about 7 percentage points.

Similar conclusions may be drawn when analyzing the effect of this tax change under the fixed-r assumption. This can be seen by comparing effective marginal tax rates shown in Table 12 with those shown in Table 10.

### 3.3 A comparison with other countries.

Averaged effective tax rates computed for Italy in 1980 may be compared with those presented in King and Fullerton (1984, Table 7.1, p.269) for the following four countries: the United Kingdom, Sweden, West Germany and the United States. Table 13 illustrates this comparison. All effective tax rates are computed assuming a fixed before-tax rate of return of 10 percent and using the actual inflation rate of each country. For Italy, we reproduce the results shown in the last column displayed for the year 1980 in Table 5. That is to say, effective tax rates are computed using the annual average rate of inflation in the period 1980-85 and assuming that the fraction of financing through debt is about one-half. The reason for the latter choice is that at the beginning of the eighties the actual financing method of the corporations was still heavily based upon some sort of debt instruments.

The most striking result of this comparison concerns the almost generalized subsidies supplied by the Italian tax system compared with the positive effective tax rates usually levied in the other countries. Apart from the United Kingdom, whose overall effective tax rate was very low in 1980 (3.7 percent), for the

three other countries considered, the averaged tax rates are: 35.6 percent in Sweden, 48.1 percent in West Germany and 37.2 percent in the United States. In Italy, on the contrary, there is a subsidy of 7.4 percent.

Similar to other countries, a marginal investment in inventories is taxed in Italy at a higher rate than a corresponding investment in fixed assets. The effective tax rate is however much lower in Italy than everywhere else (10 percent with respect to effective tax rates ranging from 39.5 percent in the United Kingdom to 68.8 percent in Sweden). The subsidy supplied to machinery (-20.3 percent) is not very distant from that observed in the United Kingdom (-37 percent), where machinery was allowed (in 1980) immediate expensing. Whereas the other countries show a very similar and fairly high (about 40 percent) effective tax rate on investment in buildings, for Italy we observe, again, a negative effective tax rate. As a result, all sectors, though in different degrees, are subsidized.

The deductibility of interest payments makes debt the most convenient source of finance in every country. In Italy the subsidy is higher (-52.7 percent) than in the other countries considered with the exception of Britain (where the subsidy is minus 100.8 percent). In the latter country however a marginal investment financed in 1980 by new share issues received a small subsidy (-4.2 percent), whereas in Italy it was heavily taxed (+80.6 percent).

We have seen in section 3.1 how sensitive effective tax rates are to changes in the fraction of the marginal investment financed by debt. The overall effective tax rates displayed in Table 13 depend heavily on the weights used to generate these average results. They depend also on other non-tax factors, such

as the assumed exponential rate of economic depreciation and the actual inflation rate. To investigate "how much of the overall tax differences is attributable to tax law and how much is due, instead, to differences in measured weights, inflation rates or actual depreciation rates" (p.278) King and Fullerton perform several simulations. For instance, they calculate effective tax rates using a common set of weights, inflation rates and depreciation rates. The selected common parameters for undertaking this exercise are those of the United States. Applying the same methodology to the Italian case we have constructed Table 14 (for Italy the proportion of debt and equity ownership for households and tax-exempt institutions have been added together).

The effective tax rates illustrated in this Table must obviously be interpreted with caution. As underlined in King-Fullerton, for instance (p.278), the overall effective tax rate might be expected to be higher when a common set of weights is used, because of the substitution effects among assets, industries, sources and ways of financing induced by different tax treatments. In Italy, the overall effective tax rate is higher than the one illustrated in Table 13 for the following principal reasons:

(a) the relative proportion of machinery (the most subsidized asset) is higher in Italy than in the United States;

(b) Italy has also a higher proportion of debt financing than the United States on average;

(c) the rate of inflation for the United States (6.77 percent) is much lower than that used to compute effective tax rates for Italy in Table 13 (15 percent).

A counterbalancing effect is the relatively higher weight

attributed to highly subsidized insurance companies, when using the United States ownership shares.

The most interesting result of this exercise is that it confirms the relatively much lower taxation of income from capital in Italy than in each other country considered. The overall marginal effective tax rate is in fact 4.5 percent in Italy, whereas it is 18.9 percent in the United Kingdom, 52.6 percent in Sweden and West Germany, 37.2 percent in the United States. In spite of the low overall tax rate, the distortions induced by the taxation of capital income are by no means less remarkable in Italy than in the other countries considered.

In general we can say that Italy has the lowest effective tax rate because it combines a very generous corporate tax system (including investment incentives) with generally very low statutory tax rates on income from capital borne by final investors. For an individual owner, as we have seen, only dividend income is taxed according to the personal progressive income tax. Capital gains may easily elude tax payments, whereas different types of interest income (from bonds, deposits, etc.) are liable to final schedular withholding taxes levied at different, but usually very modest, nominal rates. Not only the corporate, but also the personal tax system is in Italy much more favourable than a comprehensive income tax system.

Since 1980 there have been significant changes in the tax laws of the countries considered in Table 14. As far as Italy is concerned, we have seen that in 1985 the overall effective tax rate was even lower than in 1980. The application of the United States non-tax parameters to the standard tax parameters computed for Italy in 1985 confirms this result: the effective overall tax rate is reduced from 4.5 to 3.0 percent.

The tax law that will come into force with the "Testo Unico" of direct taxation does not increase the personal wedge. On the contrary, as we have seen, it makes explicit for instance the exemption of capital gains realized by an individual shareholder. The authorities, in drafting this legislation, have even decided to abandon the statements contained in the current law of direct personal taxation, referring to the principle of comprehensive income taxation<sup>39</sup>.

On the other hand, as has been shown in the previous section, the "Testo Unico" increases corporate taxation (above all on long-lived assets) and consequently the overall effective tax rate by changing the accelerated depreciation scheme on fixed assets. The effect of this tax change, evaluated using the 1985 Italian standard tax parameter and the United States non-tax parameters is to increase the weighted marginal tax rate from 3 percent to 13.5 percent.

### **Conclusions.**

This paper estimates effective marginal total tax rates on income from capital for a set of hypothetical investment projects in the Italian corporate sector.

The most striking result is obtained when comparing Italy with other countries. Under the assumption of a fixed pre-tax rate of return of 10 percent and applying the 1980 tax law of each country to the United States economy, King and Fullerton (1984) found that the overall effective tax rates are: United Kingdom 18.9 percent, Sweden 52.6 percent, Germany 52.6 percent and United States 37.2 percent. For Italy we obtained a much lower figure: 4.5 percent.

The overall mean tax rates are usually very low in Italy and become sizeable subsidies the higher the proportion of debt finance is at the margin.

Despite the low overall tax wedge between the return on investment and the return on saving, the Italian tax system discriminates notably among different assets and industries and above all among different forms used to finance investment. For example, using the 1985 standard parameters and assuming a five percent rate of inflation and a fixed pre-tax real rate of return of 10 percent, we found that a debt-financed marginal investment in machinery undertaken in the manufacturing sector receives a subsidy of 76, 99 and 132 percent depending on the particular way through which savings are channeled into companies (direct ownership, and intermediation through investment funds and insurance companies respectively). The same investment project (machinery in manufacturing), on the other hand, is usually taxed (at rates ranging from 17 to 20 percent) if the marginal source of finance is new share issues, except when saving is channeled into companies through the intermediation of an insurance company, in which case there is still a notable subsidy (84 percent). The highest tax rate is the 59 percent rate observed for an investment in inventories when the marginal source of finance is again new share issues, held by an individual investor through the intermediation of an investment fund.

The effect of inflation on marginal tax rates was also investigated in the present study. Our general conclusion is that in Italy the overall effective tax rate falls with the increase in the inflation rate. It should be pointed out, however, that this result and the magnitude of the effects induced on effective marginal tax rates by inflation again heavily depend on the

different assumptions made about the marginal debt-equity ratio. This is due to the fact that inflation decreases the effective tax rate for a debt financed investment, whereas the opposite occurs when investment is financed at the margin with equity capital.

Finally, the effect of the new accelerated depreciation scheme that will come into force in 1988 was examined. We found that it increases notably the effective tax rate on buildings, thus reducing the tax discrimination between this asset and inventories, while widening that between buildings and machinery. As a consequence of this new scheme of depreciation allowances on fixed assets, the overall tax rate increases by about 7-10 percentage points, depending on the assumptions made to compute effective marginal tax rates. For a low marginal debt-equity ratio the overall tax rate ranges from 20 to 30 percent, according to different assumptions made for inflation and for equilibrium in the capital market. For higher marginal debt-equity ratios the overall tax rate is much lower and a subsidy might still emerge for high rates of inflation. This is quite an interesting result if one considers that the tax wedge measured between the return on investment and the return on saving includes both corporate taxes (levied at a statutory rate of 46.37 percent including Ilor and Irpeg) and personal taxes on income from capital.



## Notes.

(1) An "effective marginal total tax rate" is a measure of the difference induced by tax legislation between the gross of tax rate of return to capital at the margin and the net-of-tax return to the saver who provides the finance. Many aspects of the tax code affecting investment and saving decisions (depreciation allowances, statutory tax rates, tax credits, etc.) may be summarized using this measure. An estimate of effective marginal tax rates in Italy focusing on different forms of investment financing is available in Giannini (1986).

(2) This is mainly due to the sensitivity to the underlying assumptions shown by marginal effective tax rates. See Bradford and Fullerton (1981), Fullerton (1986), Bradford and Stuart (1986).

(3) Effective marginal tax rates for these four countries are computed in King and Fullerton (1984). The comparison refers to the year 1980.

(4) The system in force before was of the classical type. In addition to the corporation tax, dividends received by an individual shareholder were liable either to a final schedular withholding tax or to the personal progressive income tax. Pure holding companies paid a reduced corporate tax rate.

(5) This occurs because the corporate tax system may induce a positive, as well as a negative distortion on investment decisions. See, for example, King (1975), Stiglitz (1976), Boadway (1980).

(6) An example is the possibility of deferring the tax payments on realized capital gains if gains are reinvested within two tax periods. In practice, this aspect of the tax code allows firms to postpone the payment of both the local and the corporate income tax for two years even though these gains are not reinvested. When reinvested, however, the taxation of capital gains may be further deferred for a period which is longer the higher the tax life is of the asset being acquired. This occurs because reinvested capital gains decrease the depreciation base of the asset. The "Testo Unico" of direct taxation abolishes any link between the favourable tax treatment of realized capital gains and the investment policy of corporations. Under this law, in fact, firms may in any case spread the tax payment on realized capital gains over a period of ten years.

Another aspect of the Italian tax code which could not be taken into account in this study, even though it might affect corporate investment decisions, concerns the possibility of eluding tax payments by simply merging with companies that show fiscal losses.

(7) Ministry of Finance, Circular n.105, 1st December 1965.

(8) See Rosa (1979), Rosa and Siesto (1985).

(9) Individuals did not have similar opportunities, since they are allowed to deduct interest payments against the personal tax base only for mortgages. There are also ceilings to these deductions.

(10) In addition to this legislation, enacted explicitly to compensate for the distortions due to inflation, firms were in practice allowed to follow an indirect method for revaluations in the period 1975-80. It consisted of creating a new ad-hoc company (Y) entirely held by the original one (X). For the valuation of assets given in exchange for shares from company X to company Y the law allowed with wide discretion a departure from the historical accounting system. Originally thought to guarantee fiscal neutrality in restructuring of big companies this legislation has been widely used because of its tax advantages.

(11) This legislation has been extended to 1993, with some important modifications, by the law n.64 of March 1986.

(12) For a more detailed description see, for example, Ranci (1983). An interesting discussion on the use of investment incentives to promote industrialization in the Southern regions can be found in Faini and Schiantarelli (1983).

(13) See CER and IRS (1986) p.148.

(14) The source of these data is the financial statistics published by the Bank of Italy in the Appendix to the Annual Report. The data have been adjusted to exclude the nationalized electricity industry (Enel). The proportion of equity ownership was obtained from unpublished data of the Central Bank.

(15) The source is the balance sheet annually published by Mediobanca using a sample (1504) of medium and large-sized corporations. Debt includes only net short term bank borrowing and long term debenture. Equity capital is inclusive of asset revaluations.

(16) This is true for bonds but not for certificates of deposit (the other major liability of Special Credit Institutions) whose principal owner is households. Both bonds and certificates of deposits are included in the data shown in Figure 1.

(17) Among the transactions inherently regarded as speculative certain substantial disposal of shares are included as from 1985, if the holding period is less than five years (see the law n.17 of 1985).

(18) See Banca d'Italia (1987), Relazione Annuale for the year 1986, "Considerazioni Finali".

(19) Different approaches may be used. For a critical review see Fullerton (1984).

(20) In the period 1980-85 the average before-tax interest rate was: 17 percent and 18.5 percent on tax-exempt Treasury Bills and Treasury Certificates, respectively; 13.3 percent on bank deposits; 16.7 and 16.9 percent on bonds issued by state-owned companies and by Special Credit Institutions; 17.7 percent on private debenture loan stock.

(21) It is worth noting that this assumption is consistent with the fact that the Italian tax system does not usually allow

the deduction of interest payments against the personal tax base (see footnote 10). The cost of retiring a unit of debt is therefore, for an individual, the before-tax interest rate  $i$ .

(22) For further discussion of this "tax-discrimination variable" see King and Fullerton (1984), p.22 and King (1977), chap. 3.

(23) This occurs because under the 1985 tax law the deductibility of interest payments against the corporation tax base was limited to the portion of interest payments in excess of tax-exempt receipts. Thus, at the margin, interest payments can be regarded as fully deductible for those companies whose tax-exempt income does not exceed the interest payments.

(24) For 1980 the official data of the income tax statistics were used. For 1985 official data were not available. We used an estimate of personal income for the various tax brackets and assumed that the share of dividend on total income in each tax bracket was the same as observed in the most recently published income tax statistics. In both cases the distribution of dividends was given only by range of "total income" and no attempt was made to construct a distribution of dividends by range of taxable income. This might induce a slight overestimate of the marginal tax rate on dividends.

(25) Weights were derived from the information made available in the Annual Report of the Bank of Italy. Unfortunately separate figures for the amount of shares held by the two insurance branches in 1980 were not available. For this year the ratio of total securities (including shares) was used.

(26) See "Le Principali Società Italiane", Mediobanca, 1986.

(27) We assume that insurance companies register capital gains in their balance sheet only when realized. Otherwise according to Italian tax law insurance companies (as well as other corporations) should pay taxes on accrued capital gains.

(28) See also Di Majo and Franco (1987a).

(29) Net capital stocks at replacement cost disaggregated by assets and sectors of economic activity according to the traditional partition of national accounts were estimated for the purpose of this study, using the permanent inventory method. We used average figures for the period 1980-84. More sophisticated estimates have been made by Rosa and Siesto (1985), but only for the industrial sector.

(30) These data were provided by the Central Bureau of Statistics for each of the 44 branches that traditionally make up the input-output matrix in Italy.

(31) See, for example, Marotta and Schiantarelli (1983). Also in the macroeconomic model of the Bank of Italy the assumption is made of an average lifetime of ten years for machinery.

(32) See Marotta and Schiantarelli (1983), Faini and Schiantarelli (1983).

(33) The investment data used refer to the manufacturing sector, which is the recipient of almost all the grants awarded. The data on grants refer to accrual series and were adjusted to exclude grants awarded to the electricity and extractive sector. The procedure of dividing grants at time  $t$  by investment expenditure at time  $t+1$  incorporates the assumption "of an average one-year lag between investment decisions (and grant accrual) and actual expenditure" (Faini and Schiantarelli, 1983, p. 112).

(34) Data were not available for the manufacturing sector alone. Constructions are included.

(35) The composition of the stock of capital by asset and industry for the period 1980-84 is based on our own estimates (see footnote 22). Data on inventories in manufacturing (in the same period 1980-84) are also based on our own estimates from unpublished survey-data provided by the Central Bureau of Statistics. No data were available for the other two sectors ("other industry" and "commerce") and we assumed that Italy had a similar share of inventories in these sectors as observed in the four countries examined in King and Fullerton (1984).

It was moreover impossible to isolate the private corporate sector. Apart from some adjustment to exclude the proportion of the capital stock of the principal public utilities, data refer to the whole economy and therefore include the noncorporate business sector.

The proportion by source of finance was computed on the basis of the information shown in Figure 1. The same data-source employed to compute the debt-to-capital ratio illustrated in this Figure (see footnote 15) was used to find the average proportion of financing through new share issue and retained earnings in the period 1980-85.

Figure 1 also shows the proportion of equity by category of owner. Debt ownership was taken from Table 3.

Available data did not allow the computation of asset and industry-specific weights by source of finance and category of owner.

(36) We used in fact the financial statistics of the Bank of Italy and the Annual Report published by Mediobanca.

(37) That is to say we assumed that in 1985  $\tau=0.3625$  and  $\theta=1.333$ .

(38) This occurs because the real value of depreciation allowances falls at a reduced rate with the increase in the rate of inflation.

(39) This can be seen for example by comparing the first article of the DPR n.597/73 in force at present with the new text contained in the "Testo Unico".

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Table 1. Tax Treatment of Dividends, Interest Income and Capital Gains for an Individual Investor, 1974, 1980, 1985.

Type of Income	1974	1980	1985
Dividends	Personal Progressive Income Tax (Irpef) With Rates Ranging: From 0.10 To 0.82 (1) OR Final Schedular Withholding Tax Levied at a Rate of 0.30	Personal Progressive Income Tax (Irpef) With Rates Ranging: From 0.10 To 0.72 AND Tax Credit Equal to 1/3 of Dividend	Personal Progressive Income Tax (Irpef) With Rates Ranging: From 0.18 To 0.65 AND Tax Credit Equal to 9/16 of Dividend
Capital Gains	Exempt Unless Arising From Transactions Undertaken With a "Speculative Intent"		
Interests:	Final Schedular Withholding Tax Levied at the Following Rates:		
Deposits	0.15	0.20	0.25
Bonds:			
-Special Cred. Instit.	0.10	0.10 (2)	0.125
-State Holdings	0.20	0.20	0.125
-Private Companies	0.30	0.20	0.125
-Government	Exempt	Exempt	Exempt

(1) Including the special surcharge introduced by the decree n. 259 of 1974.  
 (2) From July 1980 a temporary exemption was in force.



Table 2. Corporate and personal tax rates, 1980, 1985.

	1980	1985				
Corporate tax rate ( $\tau$ )	0.3625	0.46368				
Opportunity cost of retained earnings ( $\theta$ )	1.3333	1.5625				
Rate of deductibility of interest payments ( $\alpha$ )	1.0	1.0				
<hr/>						
	House- holds	Invest. Funds companies	House- holds	Invest. Funds companies	Insurance companies	
Tax rate on dividend ( $m_d$ )	0.4353	-	-0.0889	0.4246	0.4240	-0.0138
Tax rate on realized capital gains	0.0	-	-0.0658	0.0	0.0	0.0065
Tax rate on wealth ( $w_p$ )	0.0	-	0.0	0.0	0.0025	0.0
Tax rate on interest ( $m_b$ )	0.1717	-	-0.0157	0.2268	0.1399	0.0338

Source: Own calculations as described in the text.

Table 3. Average Marginal Tax Rates on Interest Income, 1980, 1985.

	HOUSEHOLDS		INVESTMENT FUNDS		INSURANCE COMPANIES	
	Marginal Tax Rates	Weights	Marginal Tax Rates	Weights	Marginal Tax Rates	Weights
Channels of debt financing						
1. Issue of debenture loan stock held by:						
- Commercial banks	1980	0.0530	-	-	0.0041	0.0005
	1985	0.0326	0.2566	0.0000	0.0496	0.0002
- Final owner	1980	0.2000	0.0271	-	-0.0658	0.0023
	1985	0.1250	0.0394	0.125	-0.0540	0.0046
2. Borrowing from commercial banks						
	1980	0.2030	0.2142	-	0.0041	0.0020
	1985	0.2566	0.2146	0.2566	0.0496	0.0015
3. Borrowing from Special credit insitutions whose securities are held by:						
- Commercial banks	1980	0.2030	0.4644	-	0.0041	0.0044
	1985	0.2714	0.4021	0.2714	0.0686	0.0028
- Final owner	1980	0.0643	0.2202	-	-0.0174	0.0118
	1985	0.1425	0.2523	0.1425	0.0420	0.0336
TOTAL						
	1980	0.9789	-	-	-	0.0211
	1985	0.9410	0.9410	0.0163	-	0.0427
		Households	Inv. Funds	Insur. Comp.		
Average tax rates:		0.1717	0.1399	-0.0157		
		0.2268		0.0338		

Source: Own calculations as described in the text

Table 4. Specific Asset-Industry Parameters, 1980, 1985.

	1	9	8	0	1	9	8	5
	Manufac- Other Commerce				Manufac- Other Commerce			
	turing	Industry	Industry	Commerce	turing	Industry	Industry	Commerce
Proportion with standard depreciation ( $f_1$ )								
Machinery	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Buildings	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Inventories	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Depreciation rates for tax purposes (1/L)								
Machinery (exclud. vehicles)	0.1435	0.1436	0.1436	0.1286	0.1435	0.1436	0.1436	0.1286
Vehicles	0.2	0.1587	0.1587	0.2	0.2	0.1587	0.1587	0.2
Machinery (includ. vehicles)	0.1459	0.1518	0.1518	0.1489	0.1459	0.1518	0.1518	0.1489
Buildings	0.0358	0.0395	0.0395	0.03	0.0358	0.0395	0.0395	0.03
Inventories	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Economic (exponential) depreciation rates ( $\delta$ )								
Machinery (exclud. vehicles)	0.1179	0.1111	0.1111	0.1111	0.1179	0.1111	0.1111	0.1111
Vehicles	0.2	0.142	0.142	0.2	0.2	0.142	0.142	0.2
Machinery (includ. vehicles)	0.1214	0.1279	0.1279	0.1364	0.1214	0.1279	0.1279	0.1364
Buildings	0.0547	0.0527	0.0527	0.0513	0.0547	0.0527	0.0527	0.0513
Inventories	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduction of interest rates due to subsidized loans ( $\beta$ )								
Machinery	0.0706	0.0139	0.0139	0.0100	0.0582	0.0114	0.0114	0.0082
Buildings	0.0706	0.0139	0.0139	0.0100	0.0582	0.0114	0.0114	0.0082
Inventories	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 4 (Continued)

	1	9	8	0	1	9	8	5
	Manufac- turing		Other Industry		Manufac- turing		Other Industry	
Proportion with investment grant ( $f_2$ )								
Machinery	1.0		0.0		1.0		0.0	0.0
Buildings	1.0		0.0		1.0		0.0	0.0
Inventories	0.0		0.0		0.0		0.0	0.0
Rate of investment grant (g)								
Machinery	0.0230		0.0		0.0458		0.0	0.0
Buildings	0.0230		0.0		0.0458		0.0	0.0
Inventories	0.0		0.0		0.0		0.0	0.0
Proportion with investment Value Added Tax credit ( $f_3$ )								
Machinery	0.1534		0.0		0.0		0.0	0.0
Buildings	0.1534		0.0		0.0		0.0	0.0
Inventories	0.0		0.0		0.0		0.0	0.0
Rate of investment value added tax credit (k)								
Machinery	0.04		0.0		0.0		0.0	0.0
Buildings	0.04		0.0		0.0		0.0	0.0
Inventories	0.0		0.0		0.0		0.0	0.0

Source: Own calculations as described in the text.

Table 5. Effective Marginal Tax Rates, 1980 and 1985, Fixed-p (p=10%), "Medium" Debt-to-Capital Ratio Case.

	Inflation rate									
	zero		5%		10%		Actual (15%)			
	1980	1985	1980	1985	1980	1985	1980	1985	1980	1985
Asset										
Machinery	-9.8	-20.1	-12.9	-26.4	-16.4	-33.4	-20.3	-41.1		
Buildings	4.1	1.2	2.6	-3.3	-0.7	-10.2	-5.2	-19.0		
Inventories	28.5	33.5	22.4	21.4	16.3	9.2	10.1	-2.9		
Industry										
Manufacturing	1.7	-4.3	-2.7	-12.4	-7.7	-21.7	-13.3	-31.7		
Other industry	4.7	1.8	2.3	-4.3	-0.8	-11.7	-4.6	-19.9		
Commerce	9.1	7.7	6.7	1.4	3.3	-6.3	-0.6	-15.0		
Source of finance										
Debt	-12.2	-17.8	-24.8	-35.5	-38.4	-54.5	-52.7	-74.7		
New share issues	37.4	26.9	52.2	34.7	66.5	41.5	80.6	47.8		
Retained earnings	16.8	21.6	20.1	26.3	22.8	30.0	25.0	33.1		
Owner										
Households	5.2	1.7	2.1	-4.9	-1.7	-12.6	-6.1	-21.2		
Investment funds	-	8.4	-	4.2	-	-1.2	-	-7.3		
Insurance companies	-36.9	-23.0	-63.4	-43.8	-90.9	-66.1	-119.4	-89.5		
Overall	4.7	0.8	1.3	-6.4	-2.8	-14.7	-7.4	-23.9		

Table 6. Weights Used to Compute Average Effective Marginal Tax Rates, 1980, 1985.

	1980		1985	
	Manufac- turing	Other Industry	Manufac- turing	Other Industry
Proportion of capital stock				
Machinery	0.1874	0.1054	0.1874	0.1054
Buildings	0.1274	0.0829	0.1274	0.0829
Inventories	0.1560	0.0311	0.1560	0.0311
Proportion by source of finance (1)				
Debt	0.5550	0.5550	0.5550	0.5550
New Share Issues	0.1920	0.1920	0.1920	0.1920
Retained Earnings	0.2530	0.2530	0.2530	0.2530
Ownership shares				
Debt	0.9789	-	0.9410	0.0163
Equity	1.0000	-	0.9140	0.0378

(1) The following alternative assumptions have also been made: (a) Debt:0.215, New share issues: 0.195, Retained earnings: 0.590; (b) Debt: 0.751, New share issues: 0.108, Retained earnings: 0.141.

Source: own calculations as described in the text.

Table 7. Effective Marginal Tax Rates, 1980 and 1985, Fixed-p (p=10%), "Low" Debt-to-Capital Ratio Case.

	I n f l a t i o n                      r a t e										
	z e r o		5%		10%		10%		A c t u a l (15%)		
	1980	1985	1980	1985	1980	1985	1980	1985	1980	1985	
Asset											
Machinery	2.0	-3.6	4.6	-2.2	6.8	-1.5	8.6	-1.2			
Buildings	14.2	14.7	18.1	17.7	20.4	18.3	21.7	17.4			
Inventories	35.1	41.9	34.3	37.6	33.4	33.3	32.5	29.0			
Industry											
Manufacturing	12.7	10.4	14.3	10.3	15.2	9.3	15.8	7.6			
Other industry	14.0	14.5	16.7	15.7	18.7	15.7	20.2	15.0			
Commerce	17.8	19.6	20.4	20.5	22.2	20.2	23.4	19.0			
Source of finance											
Debt	-12.2	-17.8	-24.8	-35.5	-38.4	-54.5	-52.7	-74.7			
New share issues	37.4	26.9	52.2	34.7	66.5	41.5	80.6	47.8			
Retained earnings	16.8	21.6	20.1	26.3	22.8	30.0	25.0	33.1			
Owner											
Households	14.8	14.7	17.1	15.5	18.6	15.3	19.8	14.4			
Investment funds	-	20.3	-	23.0	-	24.6	-	25.5			
Insurance companies	-36.9	-0.6	-63.4	-8.6	-90.9	-17.9	-119.4	-28.1			
Overall	14.6	14.2	16.7	14.6	18.1	14.1	19.1	12.8			

Table 8. Effective Marginal Tax Rates, 1980 and 1985, Fixed-p (p=10%), "High" Debt-to-Capital Ratio Case.

	Inflation rate						
	zero		5%		10%		Actual (15%)
	1980	1985	1980	1985	1980	1985	
Asset							
Machinery	-18.5	-30.2	-25.8	-41.1	-33.6	-52.9	-41.8
Buildings	-3.4	-6.9	-9.0	-15.8	-16.4	-27.5	-25.2
Inventories	23.3	28.3	13.2	11.4	3.1	-5.5	-7.1
Industry							
Manufacturing	-6.3	-13.2	-15.1	-26.3	-24.6	-40.5	-34.6
Other industry	-2.4	-6.0	-8.6	-16.5	-15.7	-28.4	-23.4
Commerce	2.4	0.4	-3.9	-10.3	-11.1	-22.5	-19.0
Source of finance							
Debt	-12.2	-17.8	-24.8	-35.5	-38.4	-54.5	-52.7
New share issues	37.4	26.9	52.2	34.7	66.5	41.5	80.6
Retained earnings	16.8	21.6	20.1	26.3	22.8	30.0	25.0
Owner							
Households	-2.2	-6.3	-9.3	-17.4	-17.3	-29.8	-25.8
Investment funds	-	-3.3	-	-14.2	-	-26.4	-
Insurance companies	-36.9	-32.6	-63.4	-58.8	-90.9	-86.7	-119.4
Overall	-2.7	-7.4	-10.2	-19.2	-18.45	-32.2	-27.3



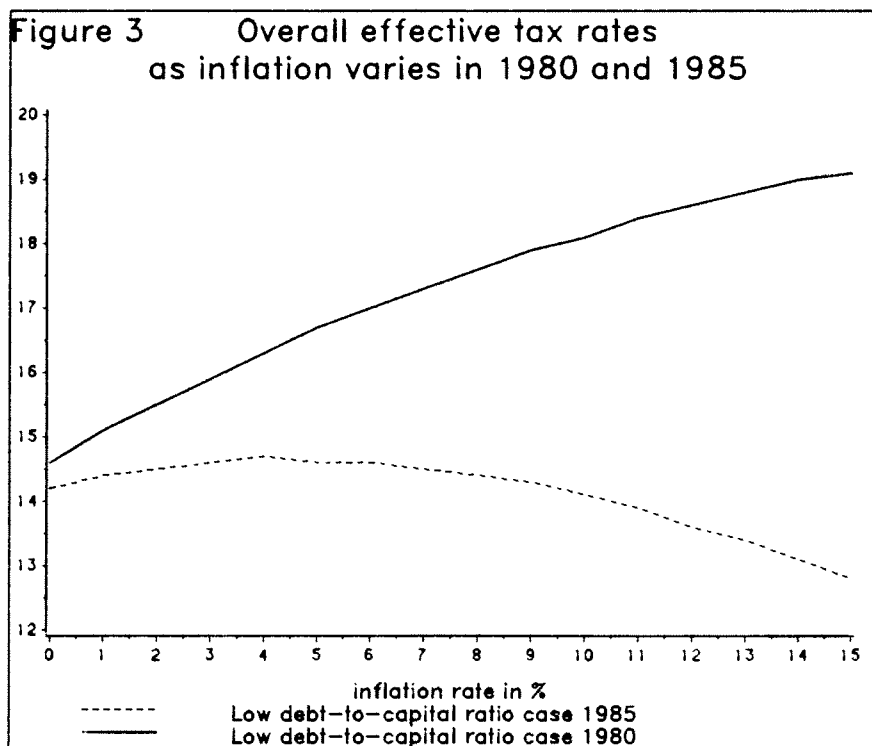
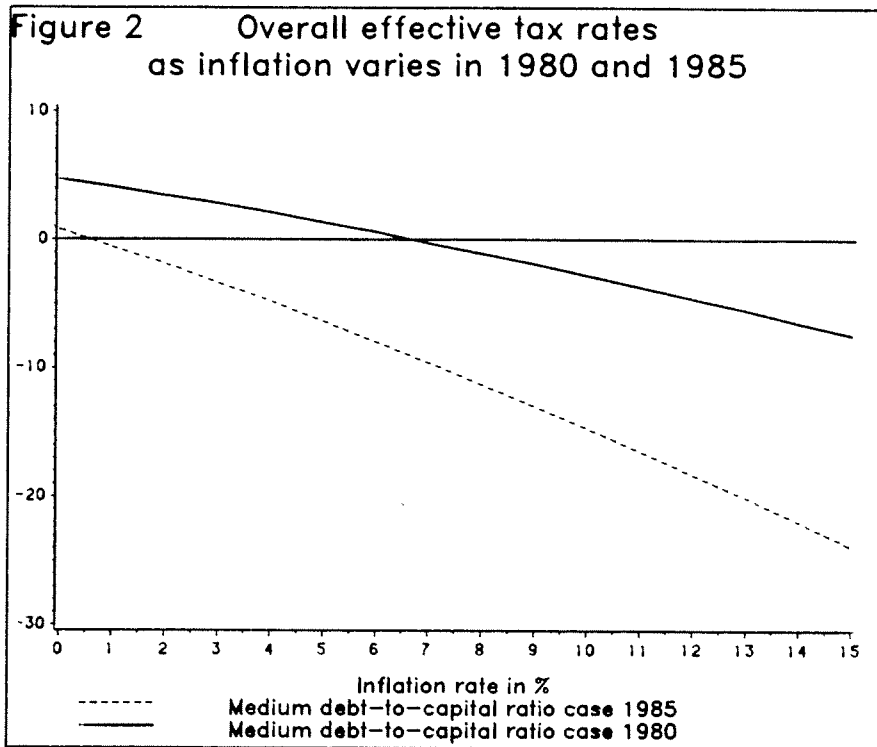


Table 9. The effect of the increase in the statutory corporate tax rate between 1980 and 1985. Fixed-p (p=10%), "Medium" Debt-to-Capital Ratio Case.

Asset	Rate of inflation											
	zero			5 percent			10 percent			1985 (1)		
	1980	1985	1985 (1)	1980	1985	1985 (1)	1980	1985	1985 (1)	1980	1985	1985 (1)
Machinery	-9.8	-20.1	-8.5	-12.9	-26.4	-9.6	-16.4	-33.4	-11.1	-16.4	-33.4	-11.1
Buildings	4.1	1.2	6.3	2.6	-3.3	6.7	-0.7	-10.2	5.3	-0.7	-10.2	5.3
Inventories	28.5	33.5	30.8	22.4	21.4	26.4	16.3	9.2	22.0	16.3	9.2	22.0
Industry												
Manufacturing	1.7	-4.3	2.2	-2.7	-12.4	-0.1	-7.7	-21.7	-3.0	-7.7	-21.7	-3.0
Other industry	4.7	1.8	7.9	2.3	-4.3	7.2	-0.8	-11.7	5.8	-0.8	-11.7	5.8
Commerce	9.1	7.7	12.1	6.7	1.4	11.3	3.3	-6.3	9.7	3.3	-6.3	9.7
Source of finance												
Debt	-12.2	-17.8	-6.7	-24.8	-35.5	-15.3	-38.4	-54.5	-24.7	-38.4	-54.5	-24.7
New share issues	37.4	26.9	32.8	52.2	34.7	45.7	66.5	41.5	58.1	66.5	41.5	58.1
Retained earnings	16.8	21.6	15.5	20.1	26.3	18.9	22.8	30.0	21.5	22.8	30.0	21.5
Owner												
Households	5.2	1.7	7.4	2.1	-4.9	6.5	-1.7	-12.6	4.9	-1.7	-12.6	4.9
Investment funds	-	8.4	12.0	-	4.2	12.2	-	-1.2	11.6	-	-1.2	11.6
Insurance companies	-36.9	-23.0	-15.4	-63.4	-43.8	-28.9	-90.9	-66.1	-43.2	-90.9	-66.1	-43.2
Overall	4.7	0.8	6.5	1.3	-6.4	5.1	-2.8	-14.7	2.9	-2.8	-14.7	2.9

(1) Assuming that the corporate tax rate  $\tau$  and the opportunity cost of retained earnings  $\theta$  were unchanged in 1985 with respect to the 1980 values.



Table 10. Effective Marginal Tax Rates, 1980 and 1985, Fixed-r (r=5%).

Asset	"Medium" debt-to-capital ratio case						"Low" debt-to-capital ratio case					
	Inflation rate			Inflation rate			Inflation rate			Inflation rate		
	zero	5%	zero	5%	zero	5%	zero	5%	zero	5%	zero	5%
	1980	1985	1980	1985	1980	1985	1980	1985	1980	1985	1980	1985
Machinery	-8.5	-24.2	-10.1	-37.2	1.8	-7.3	1.8	-7.3	1.8	-7.3	9.5	-1.5
Buildings	5.9	1.1	8.6	-1.7	14.7	13.9	14.7	13.9	14.7	13.9	23.8	22.2
Inventories	31.7	36.5	26.5	22.0	37.1	43.7	37.1	43.7	37.1	43.7	38.0	40.5
Industry												
Manufacturing	7.3	1.7	3.7	-13.7	16.2	15.0	16.2	15.0	16.2	15.0	21.2	16.5
Other industry	9.1	6.7	8.7	-1.8	16.7	17.8	16.7	17.8	16.7	17.8	23.0	21.4
Commerce	13.6	13.1	13.3	5.0	20.8	23.3	20.8	23.3	20.8	23.3	26.6	26.4
Source of finance												
Debt	-12.6	-18.1	-55.4	-97.8	-12.6	-18.1	-12.6	-18.1	-12.6	-18.1	-55.4	-97.8
New share issues	38.2	29.7	52.7	39.8	38.2	29.7	38.2	29.7	38.2	29.7	52.7	39.8
Retained earnings	16.9	22.9	21.7	29.1	16.9	22.9	16.9	22.9	16.9	22.9	21.7	29.1
Owner												
Households	10.1	7.2	8.7	-3.1	17.9	18.6	17.9	18.6	17.9	18.6	23.6	21.5
Investment funds	-	17.5	-	15.2	-	25.4	-	25.4	-	25.4	-	30.3
Insurance companies	-38.9	-15.6	-225.7	-83.8	-38.9	7.0	-38.9	7.0	-38.9	7.0	-225.7	-3.7
Overall	9.8	6.6	7.9	-4.6	17.8	18.3	17.8	18.3	17.8	18.3	23.3	20.9

Table 11. Effective Marginal Tax Rates with the New Accelerated Depreciation Scheme.  
Fixed-p (p=10%)

Asset	"Medium" debt-to-capital ratio case			"Low" debt-to-capital ratio case		
	Inflation rate			Inflation rate		
	zero	5%	10%	zero	5%	10%
Machinery	-18.9	-24.6	-31.2	-2.6	-0.7	0.5
Buildings	21.7	19.7	12.9	32.3	37.4	38.3
Inventories	33.5	21.4	9.2	41.9	37.6	33.3
Industry						
Manufacturing	2.5	-4.8	-13.7	16.2	16.9	16.1
Other industry	8.9	3.9	-2.9	20.7	22.9	23.3
Commerce	16.1	10.9	3.4	26.9	28.8	28.6
Source of finance						
Debt	-9.1	-25.5	-44.4	-9.1	-25.5	-44.2
New share issues	32.3	40.8	47.9	32.3	40.8	47.9
Retained earnings	27.4	32.9	36.8	27.4	32.9	36.8
Owner						
Households	9.0	3.4	-4.0	21.0	22.7	22.8
Investment funds	15.3	12.1	7.0	26.4	29.9	31.7
Insurance companies	-13.9	-33.4	-55.3	6.8	-0.2	-9.1
Overall	8.1	2.0	-6.0	20.5	21.9	21.6

Table 12. Effective Marginal Tax Rates with the New Accelerated Depreciation Scheme,  
Fixed-r (r=5%)

	"Medium" debt-to-capital ratio case		"Low" debt-to-capital ratio case	
	Inflation rate z e r o	5%	Inflation rate z e r o	5%
Asset				
Machinery	-23.0	-34.4	-6.3	0.4
Buildings	23.6	26.8	33.5	42.4
Inventories	36.5	22.0	43.7	40.5
Industry				
Manufacturing	9.0	-1.3	21.2	24.6
Other industry	14.7	10.5	24.8	30.2
Commerce	22.5	18.5	31.6	36.0
Source of finance				
Debt	-7.8	-65.5	-7.8	-65.5
New share issues	35.8	45.9	35.8	45.9
Retained earnings	29.7	36.7	29.7	36.7
Owner				
Households	15.3	9.5	25.7	30.2
Investment funds	24.8	25.0	31.9	37.9
Insurance companies	-5.4	-54.6	15.2	9.1
Overall	14.8	5.4	25.5	29.7

Table 13. Effective Marginal Tax Rates for Different Countries, 1980, Fixed-p (p=10%)  
(actual inflation, actual depreciation, actual weights)

	Italy	United Kingdom	Sweden	West Germany	United States
Asset					
Machinery	-20.3	-36.8	0.2	44.5	17.6
Buildings	-5.2	39.3	36.6	42.9	41.1
Inventories	10.1	39.5	68.8	59.0	47.0
Industry					
Manufacturing	-13.3	-9.6	27.1	48.1	52.7
Other industry	-4.6	-5.4	60.5	57.0	14.6
Commerce	-0.6	36.2	39.2	44.4	38.2
Source of finance					
Debt	-52.7	-100.8	5.0	-3.1	-16.3
New share issues	80.6	-4.2	90.4	62.6	91.2
Retained earnings	25.0	30.6	68.2	90.2	62.4
Owner					
Households	-6.1	42.0	105.1	71.2	57.5
Tax-exempt instit.	-	-44.6	-51.8	6.3	-21.5
Insurance companies	-119.4	-6.7	18.9	-3.8	23.4
Overall	-7.4	3.7	35.6	48.1	37.2

Sources: Table 5 (for Italy) and Table 7.1 in King and Fullerton (1984), p.269,  
(for the other countries)

Table 14. Effective Marginal Tax Rates for Different Countries, 1980, Fixed-p (p=10%),  
(6.77 percent inflation, United States depreciation and weights)

	Italy	United Kingdom	Sweden	West Germany	United States
Asset					
Machinery	-8.6	-37.3	19.0	53.8	17.6
Buildings	1.3	31.7	56.0	42.0	41.1
Inventories	24.5	43.3	76.7	75.4	47.0
Industry					
Manufacturing	10.5	21.0	60.9	69.3	52.7
Other industry	-5.8	1.1	40.2	32.5	14.6
Commerce	6.8	37.4	53.5	48.2	38.2
Source of finance					
Debt	-33.2	-45.0	22.0	-20.3	-16.3
New share issues	53.5	40.4	96.4	59.2	91.2
Retained earnings	21.4	52.4	65.9	92.2	62.4
Owner					
Households	8.5	43.3	92.5	73.3	57.5
Tax-exempt instit.	-	-43.6	-52.4	19.3	-21.5
Insurance companies	-41.6	-19.8	-3.6	-37.2	23.4
Overall	4.5	18.9	52.6	52.6	37.2

Source: Own calculations (for Italy) and Table 7.8 in King and Fullerton (1984), p.283 (for the other countries).



## APPENDIX A. EFFECTIVE TAX RATES IN EACH COMBINATION (in percent), Fixed-p case (p=10%).

Asset	Industry	Source of Finance	Owner	1980		1985	
				Inflation		rates	
				Zero	Actual (15%)	Zero	Actual (15%)
1	1	1	1	-40.0	-84.5	-58.2	-113.4
1	1	1	2	-	-	-73.5	-151.7
1	1	1	3	-71.7	-160.2	-97.7	-204.1
1	1	2	1	24.6	69.9	7.1	36.7
1	1	2	2	-	-	9.5	39.0
1	1	2	3	-45.4	-97.4	-63.7	-126.0
1	1	3	1	-0.1	10.8	-3.3	12.7
1	1	3	2	-	-	-0.8	15.2
1	1	3	3	-3.4	6.2	-3.0	13.2
1	2	1	1	-20.3	-54.5	-27.6	-75.4
1	2	1	2	-	-	-39.4	-109.4
1	2	1	3	-47.5	-123.4	-59.4	-156.7
1	2	2	1	31.3	76.1	21.3	49.4
1	2	2	2	-	-	23.8	51.7
1	2	2	3	-32.5	-85.5	-38.6	-103.4
1	2	3	1	8.7	19.0	12.5	26.9
1	2	3	2	-	-	15.0	29.4
1	2	3	3	5.6	14.4	12.8	27.4
1	3	1	1	-19.2	-52.0	-26.3	-72.4
1	3	1	2	-	-	-38.0	-106.2
1	3	1	3	-46.2	-120.4	-57.8	-153.0
1	3	2	1	31.6	76.8	21.9	50.7
1	3	2	2	-	-	24.3	53.0
1	3	2	3	-31.9	-84.1	-37.6	-101.4
1	3	3	1	9.2	19.9	13.1	28.2
1	3	3	2	-	-	15.6	30.7
1	3	3	3	6.1	15.4	13.4	28.7
2	1	1	1	-21.3	-64.6	-27.6	-82.1
2	1	1	2	-	-	-39.5	-117.0
2	1	1	3	-48.8	-135.8	-59.5	-165.0
2	1	2	1	34.7	80.7	25.0	55.0
2	1	2	2	-	-	27.5	57.3
2	1	2	3	-26.0	-76.7	-32.1	-93.7
2	1	3	1	13.2	25.0	16.6	33.1
2	1	3	2	-	-	19.1	35.6
2	1	3	3	10.2	20.5	16.9	33.5
2	2	1	1	-9.3	-42.2	-11.8	-58.4
2	2	1	2	-	-	-21.9	-90.5
2	2	1	3	-34.0	-108.3	-39.7	-135.3
2	2	2	1	37.5	83.1	31.1	60.0
2	2	2	2	-	-	33.5	62.3
2	2	2	3	-20.5	-71.9	-21.5	-85.0
2	2	3	1	17.0	28.3	23.3	38.6
2	2	3	2	-	-	25.8	41.1
2	2	3	3	14.1	23.8	23.6	39.1

## APPENDIX A (continued)

Asset	Industry	Source of Finance	Owner	1980		1985	
				Inflation		rates	
				Zero	Actual (15%)	Zero	Actual (15%)
2	3	1	1	-5.5	-38.2	-6.7	-53.4
2	3	1	2	-	-	-16.2	-85.0
2	3	1	3	-29.3	-103.4	-33.3	-129.1
2	3	2	1	39.5	84.7	34.0	62.4
2	3	2	2	-	-	36.4	64.7
2	3	2	3	-16.7	-68.8	-16.3	-80.6
2	3	3	1	19.6	30.5	26.6	41.4
2	3	3	2	-	-	29.1	43.9
2	3	3	3	16.8	26.0	26.9	41.8
3	1	1	1	17.2	-27.8	22.7	-43.7
3	1	1	2	-	-	16.5	-74.2
3	1	1	3	-1.6	-90.7	3.4	-117.0
3	1	2	1	52.0	89.1	51.8	66.9
3	1	2	2	-	-	54.2	69.3
3	1	2	3	7.5	-60.4	15.0	-72.7
3	1	3	1	36.3	36.3	46.4	46.4
3	1	3	2	-	-	48.9	48.9
3	1	3	3	33.7	31.8	46.6	46.8
3	2	1	1	17.2	-27.8	22.7	-43.7
3	2	1	2	-	-	16.5	-74.2
3	2	1	3	-1.6	-90.7	3.4	-117.0
3	2	2	1	52.0	89.1	51.8	66.9
3	2	2	2	-	-	54.2	69.3
3	2	2	3	7.5	-60.4	15.0	-72.7
3	2	3	1	36.3	36.3	46.4	46.4
3	2	3	2	-	-	48.9	48.9
3	2	3	3	33.7	31.8	46.6	46.8
3	3	1	1	17.2	-27.8	22.7	-43.7
3	3	1	2	-	-	16.5	-74.2
3	3	1	3	-1.6	-90.7	3.4	-117.0
3	3	2	1	52.0	89.1	51.8	66.9
3	3	2	2	-	-	54.2	69.3
3	3	2	3	7.5	-60.4	15.0	-72.7
3	3	3	1	36.3	36.3	46.4	46.4
3	3	3	2	-	-	48.9	48.9
3	3	3	3	33.7	31.8	46.6	46.8