

WILL ITALY'S TAX REFORM REDUCE THE CORPORATE TAX BURDEN?
A MICROSIMULATION ANALYSIS

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Will Italy's Tax Reform Reduce The Corporate Tax Burden? A Microsimulation Analysis

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Abstract

This paper analyses the impact of the corporate tax reform introduced in Italy at the beginning of 2004 on firms' tax burden. For this purpose we develop a microsimulation model reproducing the Italian corporate tax system. The model is based on an integrated dataset combining ISTAT (Italian Institute of Statistics) survey data on enterprises and company accounts, for the year 2000. The empirical analysis considers two policy scenarios. The base-line is represented by the corporate tax legislation of 2001, before the practical abolition of the Dual Income Tax system, while the reformed scenario examines the corporate tax reform passed in 2004. Simulation results show that the mean ex-post implicit tax rate increases by 0.26 percentage points. However, in spite of this, we find that for firms belonging to groups and opting for tax consolidation the mean ex-post implicit tax rate falls by 1.18 percentage points, showing in this way that groups are favoured by the new regime.

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Keywords: corporate tax, effective tax rates, microsimulation, Italy

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1. Introduction

Since 1997, the Italian business income tax system was subject to two major reforms after over twenty years where only minor changes to the regime initially designed at the beginning of the 1970s were implemented. The first was introduced in 1997 while the second one came into effect at the beginning of 2004.

Although both reforms state among their targets simplification of the business tax system as well as reduction of the firms' tax burden, the tax policy design underlying the two regimes is actually different (Maurizi and Monacelli, 2003, Giannini, 2002).

Indeed, in the first regime the idea in mind of the policy maker was to pursue selective tax burden reductions aiming at narrowing the distortion in the tax treatment of equity finance as compared to debt, implicit in the previous system. In order to attain this purpose the main innovation of the 1997 reform was the introduction of the Dual Income Tax (DIT) allowance, a dual-rate scheme where a lower statutory rate is applied on that part of business profits representing the opportunity cost of new equity financing, compared to other forms of capital investment. This system offered a structural reduction of the company tax burden depending on the amount of capital increases undertaken by the company, in the form of new subscriptions and retained earnings as established by the tax code.

On the other hand, the policy design envisaged by the 2004 reform sets explicitly that tax instruments aimed at modifying firms' financial decision tend to introduce distortions in firms' behaviour and, therefore, should be eliminated. Consequently, the reform abolishes the DIT system and moves back to a uniform tax rate system. Furthermore, the new regime sets some changes to the definition of the corporate tax base by introducing a participation-exemption regime and by removing the full imputation of dividends, and brings in an optional consolidated tax statement for corporate groups, in this way attaining, in the policy maker's proposals, simplification in the tax base computation¹.

In this paper we review the key elements of the two regimes and offer an assessment of the 2004 reform by analysing its impact on firms' tax burden. For this purpose we develop a microsimulation model reproducing in detail the corporation tax system under the two regimes. The model is based on a specific integrated dataset build at ISTAT by combining accounts data with survey data on firms, for the year 2000. The microsimulation model is 'static' in the sense that it does not include firms' behavioural responses and therefore the empirical analysis only examines the first round impact of the tax policy changes on firms.

¹ It is noteworthy that the new system actually mirrors some features of the reform introduced in 2000 in Germany (Keen, 2002).

In evaluating the impact of corporate taxation on enterprise activity, as well known, the empirical literature offers two type of effective tax rates, ex-post implicit tax rates and ex-ante marginal tax rates. The first relate taxes paid by the company to some aggregate item of the company balance sheet, such as gross profit or gross operating profit. As they use ex-post real-life data, they are often described as backward-looking indicators reflecting the fact that measures of effective taxation imply past investment decisions. On the opposite, ex-ante marginal tax rates follow a forward-looking approach focussing on enterprise marginal decisions and are based on computations of the impact of taxes on the cost of capital. Specifically, ex-ante tax rates measure the theoretical tax burden on a hypothetical marginal investment (giving no extra-profits) that produces cash-flow chargeable to tax and, therefore, are calculated to analyse how the tax system affects a marginal investment undertaken by the company, using alternative financial sources (equity, debt, retained earnings)². Methodology to derive ex-ante marginal tax rates owes its origin to King and Fullerton (1984) and was extended by Devereux and Griffith (1998) to infra-marginal investments, that is investments with different rates of profitability. In the latter case the literature refers to ex-ante average tax rates.

Being theoretical measures, forward-looking indicators do not take into account the complexity and the interaction of all elements of the tax system (definition of corporate profits for tax purposes, carry-forward losses provisions, allowances, tax credits and so on) which crucially alter effective company taxation. On the opposite, implicit tax rates can be derived considering the various features of the tax system and therefore give a precise measure of the effective tax burden supported by the firm. Such rates are particularly appropriate if the objective of the analysis is studying the effects of the tax system on enterprise cash flows and to focus on distributional burdens (for instance at sectoral level or on firms of different size).

In this paper we estimate ex-post implicit tax rates calculated as ratios of tax paid on company operating surplus to study the impact of the 2004 tax reform on the company cash-flow.

The paper is organised as follows. The main features of the two reforms are discussed in section 2 and section 3. Section 4 describes the dataset used in the empirical analysis, while section 5 presents and discusses the simulation results. Section 6 then offers some concluding remarks. The methodology used to build the microsimulation model is explored in the appendix.

² It must be noted that the theoretical model on which this approach is based implies restrictive assumptions, such as perfect information, perfect competition, no risk.

2. The Corporate Tax reform of 1997 and the DIT system: an outline

The DIT scheme was implemented in 1997 under the general purpose of reducing both the discrimination against equity finance opposed to debt and the effective tax rate³. This system was in place until the beginning of 2004 when it was definitely repealed, although in July 2001 some modifications to the initial mechanism were enacted in order to strongly reduce its effects.

Table 1 summarizes the main changes to the corporate tax system introduced in the period 1997-2004.

The DIT system works basically as a dual-rate schedule where overall profits are divided into two components. The first approximates normal profits or ordinary income, that is the opportunity cost of new financing with equity capital (in the form of new capital subscriptions and retained earnings) compared to other forms of capital investments, and is taxed at the preferential rate of 19%. Ordinary income is calculated by applying an assigned nominal rate of capital return to the annual capital increase, evaluated with reference to the value of capital stock at the date 31/09/96, when the reform was actually presented, net of increases (again evaluated with respect to 1996) in loans to subsidiaries, loans to parent companies, or other investments held as fixed assets by the firm. The nominal rate, set yearly by the government, was 7% from 1997 up to 2001.

The second component of overall profits is computed residually from total profits after ordinary income and represents business extra-profits. Such profits are taxed at the prevailing statutory rate, 37% up to 2000 then cut to 36% in 2001. In order to limit revenue losses resulting from the introduction of the dual-rate schedule, the law fixed as 27% the average rate under which the effective corporate tax rate could not fall. Furthermore, the law provided that firms could bring allowable DIT profits forward up to five years whenever they could not benefit from the reduced rate, that is when they incurred in losses and when ordinary profits exceeded total taxable income.

In the first years of application, the dual-rate system benefited mainly new and less capitalised enterprises rather than highly capitalised companies (Bordignon, Giannini, Panteghini, 2001). Therefore, in order to accelerate the impact of the reform, in 2000 some

³ The Dual Income Tax systems of some Northern European countries, as well as the Allowance for Corporate Equity (ACE) proposed by the Institute for Fiscal Studies at the beginning of the 1990s, were clearly taken into consideration when designing the 1997 tax reform. On these aspects see Bordignon, Giannini, Panteghini (2001). It is important to stress that as for the ACE system, the DIT allowance applied both to the corporate and non-corporate sector.

corrections to the original reform were brought in⁴. Specifically, according to the new rules, when computing ordinary income capital increases are multiplied (up to the enterprise net wealth threshold) by a conventional parameter set first to 20% in 2000 and then to 40% in 2001. Obviously, the idea in mind of the policy makers was to possibly move the dual-schedule system to a regime where normal profits are computed on the entire enterprise's capital stock rather than on capital increases. Moreover, in 2001 the constraint under which the average rate resulting from the application of the DIT mechanism could not fall under 27% was removed.

Formally, under the DIT regime in place in July 2001, the total corporate tax amount (T_C) can be written as follows:

$$[1] \quad T_C = t (II - 1.4 r \Delta K_{96}) + t' 1.4 r \Delta K_{96}$$

where II represents total taxable profits, r is the imputed nominal rate (7%), t the statutory corporate tax rate (36%), t' the preferential tax rate (19%), ΔK_{96} net capital increases evaluated with reference to 1996, as explained above. Therefore, under the DIT scheme, the 'effective' statutory rate ranges between t and t' , depending on the amount of profits qualifying for the allowance (ΔK_{96}).

In July 2001, when the new government came into power, some modifications to the DIT scheme were enacted under the purpose of limiting the effects of this system. As a matter of fact, such changes anticipated the intention of the (new) policy maker to repeal the dual-rate allowance, as it was at the beginning of 2004 when the tax reform came into effect. According to these measures capital increases to be taken into account when computing ordinary are 'frozen' to those undertaken until July 2001, the imputed nominal rate is lowered from 7% to 3%, the application of the 'multiplier' is abolished.

Lastly, as it appears from table 1, in 2003 the statutory corporate tax rate was cut by 2 points, therefore to 34% .

⁴ In the years 1999-2001 a temporary provision (both to corporations and unincorporated firms) working basically as an incentive scheme for (specific) investments was introduced. The relevant aspect of this allowance is that it could be cumulated with the DIT system, strengthening its effects and its general purposes. Indeed, the share of profits corresponding to the amount of investments in new instrumental goods financed through company's own capital (new subscriptions or retained earnings) were taxed at the reduced rate of 19% rather than the statutory tax rate. In this way, profits corresponding to the amount of new investments financed through new subscriptions or retained earnings were taxed at a lower rate when investments were undertaken, while ordinary income resulting from the same capital increases could benefit from the reduced rate in the following periods.

TABLE 1

Changes to the Corporate Tax system enacted in the period 1997-2004

	Introduction of a dual rate (DIT) system
	<i>Main features:</i>
1997	<ul style="list-style-type: none"> ▪ profits are divided into two component: normal profits (that is imputed return on capital increases) are taxed at the preferential rate of 19%, extra-profits are taxed at the statutory rate of 37% ▪ in computing the DIT allowance, the ‘effective’ corporate tax rate cannot fall under 27%
2000	Introduction of the so-called ‘multiplier’: in computing normal profits, capital increases are multiplied by 20%
2001 (before July)	<ol style="list-style-type: none"> 1. The ‘multiplier’ is increased to 40% 3. The constraint under which the ‘effective’ rate cannot fall under 27% is removed 4. The statutory rate is lowered to 36%
2001 (after July)	The DIT system is ‘frozen’ (introduction of changes in the computation of ordinary income, abolition of the ‘multiplier’)
2003	The statutory rate is cut to 34%
	Introduction of the Corporate Tax reform. The DIT system is definitely repealed.
	<i>Main features:</i>
2004	<ul style="list-style-type: none"> ▪ the statutory rate is 33% ▪ participation-exemption regime on both capital gains and dividends; repeal of the dividend tax relief ▪ thin capitalization rules ▪ consolidated group taxation (optional)

3. The Corporate tax reform of 2004

At the end of 2001, the government approved a Bill containing guidelines for a comprehensive tax reform affecting both direct and indirect taxation⁵. Pursuant to Law April 7, 2003, no. 80 (‘Enabling Law’), the Italian Parliament has then delegated the Italian government to implement a tax reform in compliance with the principles set out in the ‘Enabling Law’.

Regarding the corporation tax (IRES, *Imposta sul Reddito delle Società*), as shown in Table 1, the main characteristics of the new system are:

- i) the abolition of the DIT scheme and the introduction of a single rate system of 33%;
- ii) the introduction of a participation-exemption regime;
- iii) the exemption of corporate dividends along with the abolition of the dividend tax credit;

⁵ Part of this section draws on Bardazzi, Parisi, Paziienza (2004).

- iv) the introduction of thin capitalisation rules;
- iv) the introduction of an optional consolidated tax statement for groups that can be extended also to foreign subsidiaries.

Another feature of the full reform is the abolition of IRAP. This is a regional tax paid by corporations and unincorporated firms on firm's value added net of depreciation and amortizations, therefore with the exclusion of deductibility of interest costs and labour cost from the tax base. The statutory tax rate is 4.25% although since 2000 Regions can vary the rate within specific limits and rules. IRAP was introduced in 1997 in substitution of other taxes⁶ and health insurance contributions, for the simplification task. As IRAP represents the basic source of revenue for the National Health System, its abolition will necessarily be gradual.

The declared policy design underlying the 2004 tax reform is to increase simplification in the tax treatment of firms through standardisation of capital income taxation, the abolition of the dividend tax credit and group taxation, as well as to foster enterprise competitiveness. Concerning the neutrality issue, as already anticipated in the introduction of this paper, the idea behind the reform is that the tax system should not introduce distortions in firms' behaviour regarding financing policy. Therefore, the combined system of incentive for share capital (provided by the DIT allowance) and taxation of interests (by IRAP) designed in the previous tax regime to balance fiscal discrimination is eliminated⁷.

As already said, the corporate tax reform sets the abolition of the dual-rate system and provides a uniform corporate tax rate of 33%.

One of the most important innovations is the introduction of a consolidated tax regime for groups. Companies belonging to the same group can elect to consolidated taxation allowing in this way to offset profits and losses among the members of the group. The control requirement for consolidation is met when a company holds, both directly and indirectly, more than 50% of the share capital of another company and the parent company can select which controlled companies will be included in tax consolidation. Group taxation can be extended also to non-resident subsidiaries, although in this case consolidation must include all foreign subsidiaries⁸ and their income can be attributed to the parent company only to the extent of the percentage of ownership, while in the domestic case there is no such restriction. The Italian system appears to be particularly favourable compared to the group tax regimes of other EU countries⁹ where eligibility rules are generally more restrictive.

⁶ Specifically ILOR, a local tax and the tax on firms' net assets.

⁷ Abolition of IRAP also reflects the necessity to remove a tax which is peculiar in its nature as compared to the tax systems prevailing in most EU countries.

⁸ Option will last for at least three years in the case of domestic consolidation, five years in the regime for foreign subsidiaries.

⁹ An updated description of these systems is contained in the report of the European Commission (2001).

The second important innovation of the corporate tax reform is the introduction of a participation-exemption regime, where inter-corporate capital gains are exempted from taxation, and the exemption of dividends along with the abolition of the full imputation dividend tax relief. The general reasons underlying these rules relate to avoiding double taxation of inter-corporate incomes (capital gains as well as dividends) and, as it concerns dividend taxation, to international issues as the imputation system tends to favour domestic tax payers against non-resident ones (Giannini, 2003, Keen, 2002). According to the new provisions, capital gains on shares in other companies (either resident or non-resident) are exempted from taxation provided that: (i) the stake in the company is recorded as a long term asset and has been owned for at least one year; (ii) the subsidiary carries out a business activity; (iii) the subsidiary is non-resident in a tax haven country. Symmetrically, capital losses are not deductible for tax purposes if the requirements hereinbefore specified occur. Dividends paid by a company (either resident or non-resident) to its shareholders are excluded from the corporate tax base to the extent of 95% of their amount, while in the case of consolidated taxation a 100% exemption is granted¹⁰.

The post-reform regime sets also specific regulations against thin capitalisation mainly for anti-elusive purposes. According to the new system, a debt-to-equity ratio¹¹ is introduced in order to prevent thin capitalisation of companies. When financial debts granted or secured by the shareholders owning at least 10% of interest in the company exceed this threshold, interest costs are deemed as paid dividends and cannot be deducted from the tax base. Should the debt-to-equity ratio be disallowed, the company must give evidence that the exceeding amount of the financial debt is based on the company's (rather than on the shareholder's) credit capacity.

4. Data description

The microsimulation model¹² is based on an integrated dataset which combines survey data on firms with company accounts data for the year 2000. Indeed, in order to have complete representation of the corporation tax system it is necessary to build a comprehensive information system which integrates balance-sheet variables with information on firms' characteristics such as employed labour force, investments, and so on.

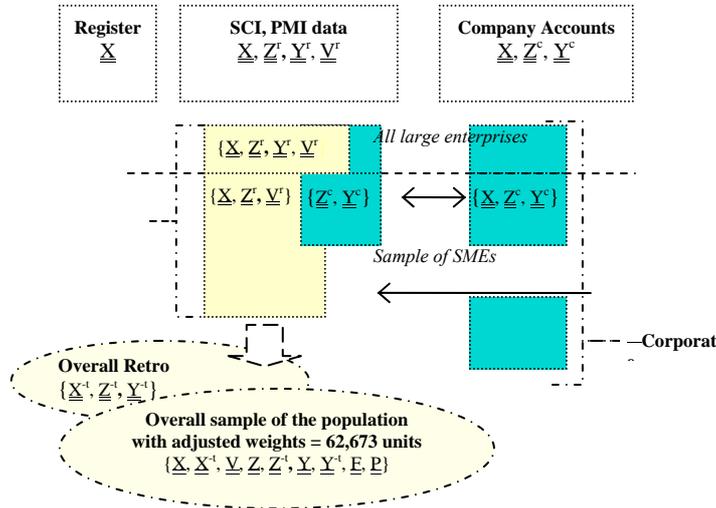
¹⁰ Again, such exemptions do not apply if the distributing company is resident in a tax haven country.

¹¹ The law sets a value of 5:1 for the first year, 4:1 for the subsequent year. In the simulations we use this value of the ratio.

¹² The microsimulation model and the dataset have been developed by the authors of this paper as part of the DIECOFIS project. This is carried out by a consortium including: ISTAT, the Board of Inland Revenue (UK), the Joint Research Centre of the European Commission (Applied Statistics Sector), Informer S.A., the London School of Economics, The University of Cambridge, The University of Economics and Business Administration of Wien (Wirtschaftsuniversitaet), the University of Rome Tor Vergata, the University of Florence, the Centre of Economic and Social Research (CERES, Italy).

The chart in figure 1 illustrates the integration steps implemented in order to obtain the final dataset, as well as the main features of the data sources, and is commented below.

FIGURE 1
Integration scheme: sources, units and variables. Year 2000



Legend:

\leftrightarrow Exact matching

\leftarrow Statistical matching

\underline{X} = Matrix register (4,146,050 corporations and unincorporated enterprises)

\underline{Z}^r = Matrix profit & loss of SCI and PMI surveys (26,278 units)

\underline{Y}^r = Matrix assets & liabilities of SCI survey dataset (8,021 rows)

\underline{V}^r = Matrix employment and other variables of SCI and PMI surveys (26,278 units)

\underline{Z}^c = Matrix profit & loss of Corporate dataset (489,516 units)

\underline{Y}^c = Matrix assets & liabilities of Corporate dataset (489,516 units)

$\{\underline{X}^r, \underline{Z}^r, \underline{Y}^r\}$ = Matrix with retrospective information (t= 1996, 1997, 1998, 1999)

The ‘spine’ information used as a basis for the integration process is represented by the statistical register of Italian active enterprises (acronym ASIA)¹³ which files all active enterprises except those belonging to the “Agriculture, forestry and fishing” sector, to the Public Sector and to the sector “Other services”¹⁴.

The dataset compounds two surveys carried out yearly by ISTAT both on corporate and unincorporated firms, the small and medium sized enterprises (acronym PMI) survey regarding firms with less than 100 workers, and the survey on large enterprises (acronym SCI) concerning firms with more than 99 workers. The SCI survey is exhaustive and therefore covers the universe of large firms (8,021 as of 2000), while the PMI survey is carried out on a sample of firms (18,257 as of 2000). Although the company balance sheet is recorded in some detail, for specific variables the information available in the survey data is matched against company

¹³ The ASIA project started in 1995 with the purpose of improving and updating the register of Italian enterprises. As of 2000 the ASIA register covers 4,146,050 firms, counting 555,621 corporations and 3,590,429 unincorporated enterprises.

¹⁴ According to the NACE classification, the following sectors: A, B, L, O91, Q.

accounts (Corporate dataset) where some variables are reported at a more disaggregated level¹⁵. Such data are collected by ISTAT from the Italian Chamber of Commerce for almost 490,000 corporations of the sectors covered by the surveys. Furthermore, because of tax modelling purposes, for specific variables the dataset also includes data of the previous years (1996-1999), as described in figure 1.

Table 2 displays the total number of companies present in the final dataset by business sector, counting 18,187 small and medium sized companies and about 8,000 large sized corporations and covering, on the whole, 26,196 companies representative of about 556,000 Italian corporate enterprises.

Data also contain information on the groups structure¹⁶ which proves to be of crucial importance to analyse the impact of 2004 corporate tax reform. The ASIA register counts 17,968 corporate groups, including about 103,000 companies¹⁷. The dataset enumerates 1,776 parent companies and 7,575 subsidiaries, roughly 10% of the reference population. Table 2 also displays the number of corporations present in the dataset participating (parent companies and subsidiaries) and not participating in groups, by business sector.

¹⁵ While for the SCI survey exact matching between survey data and company accounts is achieved (\leftrightarrow in fig. 1), as the PMI survey reports only the economic statement of the firm integration with the accounts dataset is necessary to reconstruct the balance sheet for such firms. In the case of mismatches, missing values are imputed using the donor technique. After reconstructing variables \underline{Y} and \underline{Z} which are not present in the surveys (see figure 1), a discrepancy variable is calculated in order to highlight the units which are not coherent across the different sources and that must be deleted. At the end of the process the sample weights are recalculated to comply with total population. For a detailed description of the imputation methodology see Oropallo, Inglese (2004).

¹⁶ Reconstruction of the groups structure performed at ISTAT uses other data sources, namely: (i) the Shareholders Database available from the Italian Chambers of Commerce; (ii) the Proprietorship Transparency Archive (ATP) available from the Italian Authority of the Stock Exchange market (CONSOB); (iii) the Chambers of Commerce Consolidated Balance Sheet data. The procedure follows the criteria provided by the Italian civil code according to which a controlling company must hold, both directly and indirectly, more than 50% of the share capital of another company. This is the same requirement set by the Italian tax code after the 2004 reform for companies electing to consolidated taxation. The algorithm developed at ISTAT allows to reconstruct for each group the 'chains of control' as well as to identify the enterprise with no controlling companies, that is the top of the group (parent enterprise).

¹⁷ As of 2000 ISTAT estimates on the whole 48,331 groups (Garofalo, Morganti, 2000 and Cerroni, Morganti, 2003), including unincorporated and corporate parent enterprises residing in Italy as well as abroad. It is noteworthy that in Italy a substantial share (28.8% in 2000) of parent firms are represented by individuals which are subject to the personal income tax.

TABLE 2
Number of companies present in the database by activity sector; year 2000

<i>Activity sector</i>	<i>Small and medium sized firms</i>	<i>Large firms</i>	<i>Total</i>	<i>Not part of groups</i>	<i>Part of groups</i>	
					<i>Parents</i>	<i>Subsidiaries</i>
Products from mining	218	13	231	170	13	48
Manufacturing	6,978	4,443	11,421	6,719	807	3,895
Electrical, energy, gas, steam and water	245	74	319	188	23	108
Construction	705	299	1,004	626	125	253
Wholesale and retail trade services	3,243	711	3,954	2,680	255	1,019
Hotel and restaurant services	326	197	523	322	36	165
Transport, storage and communication services	1,248	673	1,921	1,302	132	487
Real estate renting and business services	3,634	1,037	4,671	3,126	287	1,258
Education services	250	11	261	229	5	27
Health and social work services	373	387	760	635	47	78
Other social and personal services	967	164	1,131	848	46	237
Total	18,187	8,009	26,196	16,845	1,776	7,575

Source: ISTAT

5. Simulation results

The empirical analysis considers two policy scenarios. The base-case reproduces the corporate tax structure existing at July 2001, just before the practical abolition of the DIT mechanism¹⁸, while the second scenario considers the 2004 corporate tax reform. Simulations of both scenarios are run on the 2000 dataset.

The impact of the tax reform depends both on the modifications of the corporate tax base provided by the new regime and on the introduction of the statutory rate of 33% as compared to the ‘effective’ one prevailing in the 2001 scenario under the DIT system. As explained in section 2, this one ranges between the preferential rate of 19% and the statutory rate of 36%, depending on the amount of profits eligible to the allowance. Therefore, to estimate the effects of the DIT system on companies as of 2001 we first compute such ‘effective’ statutory tax rates¹⁹, shown in table 3 and table 4 as regards firm’s activity sector and enterprise size²⁰.

¹⁸ The idea behind the empirical analysis carried out in this paper is to compare the structure of the DIT system before this was ‘frozen’ with the new regime. Therefore, in the base-case we do not consider the temporary incentive on investments introduced in 1999 and then repealed in 2001.

¹⁹ These are defined as the ratio of gross corporate tax (before tax reliefs and the dividend tax credit) on taxable profits.

²⁰ To fully estimate the effects of the DIT system, ideally, the 2001 scenario simulation should be run using data of July 2001, before this system was ‘frozen’. This is generally true for all simulations referring to tax legislations of different years where balance sheets of the same years should be used, and therefore also in the 2004 regime. The other possibility could be to update the main balance sheet variables, but this procedure would inevitably be imprecise and would present strong biases. Indeed, analyses are performed using balance sheets of year 2000 both in the base-case and in the reformed scenario. As regards the effects of the DIT system, therefore, we might expect the ‘effective’ statutory rates to be lower than the estimated ones due to greater capital increases undertaken by companies between January and July 2001.

TABLE 3

'Effective' statutory corporate tax rates (ESTR) resulting from the DIT system in the base-case scenario (2001). Breakdown by activity sector, percentage values

<i>Activity sector</i>	<i>ESTR</i>
Mining and quarrying	29.74
Manufacturing	33.14
Electricity, gas, steam and water	29.10
Construction	32.08
Wholesale and retail trade	32.31
Hotels and restaurants	31.05
Transport, storage and communication	32.53
Real estate, renting and business activities	32.82
Education	33.22
Health and social work	34.27
Other service activities	31.65
Mean	32.59

Source: authors' estimates

In 2001, the mean 'effective' statutory tax rate is 32.6%, about 3.5 percentage points lower than the statutory rate (36%). In particular this system favours companies of the 'Mining and quarrying' sector (29.7%) and firms of the 'Electricity' sector (29.1%) which show rates below 30%, while firms of the 'Health and education' sector exhibit a higher 'effective' rate (34.3%) than companies of the other sectors.

One interesting aspect of the analysis is that the DIT system benefits small firms (with less than 10 employees) which record the lowest 'effective' rates, as compared to medium and large sized companies (table 4). This effect was probably desired by the policy maker given the structure of our country industrial sector.

TABLE 4

'Effective' statutory corporate tax rates (ESTR) resulting from the DIT system in the base-case scenario (2001). Breakdown by classes of employees, percentage values

<i>Size</i>	<i>ESTR</i>
From 1 to 2	31.90
From 3 to 9	32.85
From 10 to 19	33.13
From 20 to 49	33.43
From 50 to 99	33.25
From 100 to 249	33.35
From 250 to 499	33.07
From 500 to 999	33.09
Above 999	33.19
Mean	32.59

Source: authors' estimates

In the reform scenario, 2004, we consider the effects of:

- i) the abolition of the DIT scheme and the introduction of a single rate of taxation of 33%;

- ii) the exemption of capital gains on shares owned for at least one year and recorded as long term assets, and the symmetric non-deductibility of capital losses if the same requirements occur²¹;
- iii) the introduction of thin capitalisation rules limiting the amount of paid interest that can be deducted from the tax base;
- iv) the exemption of 95% of dividends and the abolition of the dividend tax relief;
- v) the introduction of the optional group taxation regime for domestic companies²², in which case dividends from companies of the same group are fully exempted from taxation.

Tables 5 and 6 present the estimated ex-post implicit tax rates both in the base-case and in the reformed scenario, along with the absolute differences, for activity sector of the firm and for classes of employees. Implicit rates are computed as ratios of the corporate tax actually paid on operating surplus recorded in the 2000 balance sheet²³. These tables also display the percentage number of firms for the various sectors, classes.

To complement the analysis of the changes in the tax burden provided by the reform with a descriptive statistic summarizing enterprise economic performance, we build a specific indicator by considering three dimensions of the firm performance, value added, export, investments, for the years 1996, 1998, 2000. The methodology is briefly described below.

Using²⁴ the decomposition of the Gini index, total inequality can be broken into three components, respectively within and between inequality and an overlapping term due to the fact that the Gini index is not perfectly decomposable, as follows:

$$[2] \quad G = \sum_{k=1}^K G_k p_k \pi_k + \frac{1}{\mu} \sum_k \sum_{k>i}^K (y_k - y_i) p_k p_i + L$$

where p_k represents the weight of class k ($k=1,2,\dots,K$), π_k the share of variable y in class k , μ the mean of variable y . After disaggregating firms by classes k (sector, size) and ordering

²¹ Information available in the dataset is not detailed enough to compute the amount of capital gains/losses potentially eligible to the exemption/non deductibility rule, as well as to identify interest costs subject to the thin capitalisation rule (as described in point iii), from the aggregate variables amounts. Therefore, in the analysis we follow the same procedure developed in the technical report on the tax reform (Ministero dell'Economia e delle Finanze, 2003) presented to the Parliament by the government.

²² Indeed, as data do not cover foreign subsidiaries, we can only simulate the impact of consolidated taxation for firms residing in Italy. In simulating the optional regime for each group we assume all companies controlled by the parent company are included in group consolidation. Furthermore, excess tax credits that firms can carry forward up to five years, can be transferred to the parent company. Any pre-consolidation losses can be set against future profits of the company which incurred in losses but cannot be deducted from the group tax base.

²³ Formally, the law sets that for firms electing to consolidation the (aggregate) corporate tax is to be paid by the parent company. Therefore, for firms belonging to groups the results refer just to the parent company. In this case the implicit rate is calculated as the ratio of the group tax on the group operating surplus.

²⁴ This kind of analysis builds on that proposed by Milanovic (2002) for poverty studies.

enterprises by values of y , the between component gives a weighted distance measure between each class k with classes i exhibiting lower mean values of y ($k > i$). The indicator ranges between 0, when the mean of y is the same in each class and therefore total inequality is due only to differences within classes and to the overlapping component, and 100, when only inequality among classes is present and no within classes differences and no overlapping effects.

Generally, we can derive a composite indicator (BC) by aggregating several dimensions (d) of the enterprise performance, as follows:

$$[3] \quad BC_k = \frac{1}{D} \sum_{d=1}^D b_k^d \quad \forall k$$

where b_k^d equals the performance indicator referred to each class k and dimension d , as defined by the second term of equation 2. As already said above, in this study the composite indicator is computed using three dimensions, value added, export, investments ($BC = b^{va} + b^{exp} + b^{inv}$). The final idea is to rank firms belonging to different classes from the most competitive (best performing) to the least ones. Figures 2 and 3 display in the upper part the percentage values of the performance indicator as regards business sector and enterprise size. For the sake of exposition these figures also reports, in the lower part, the absolute variation of ex-post corporate tax rates associated with each sector, size. Classes of firms are ordered in a decreasing way in relation to the performance statistic.

As a total effect, the simulated reform lowers the corporate tax base by about 3 percentage points, while total tax revenue decreases by 0.9 percentage points. Table 5 reveals that in the new regime the mean implicit tax rate goes up by 0.26 percentage points, from 18.01 to 18.27.

Table 5 highlights some differences in the effective company tax burden due to specific characteristics of the enterprises (production function) and features of the corporate tax system (depreciation rates, allowances, tax reliefs and so on). In the base-line, the effective rate of taxation ranges from about 10% in the ‘Other social and personal services’ sector to about 20% for in the ‘Electricity’ sector.

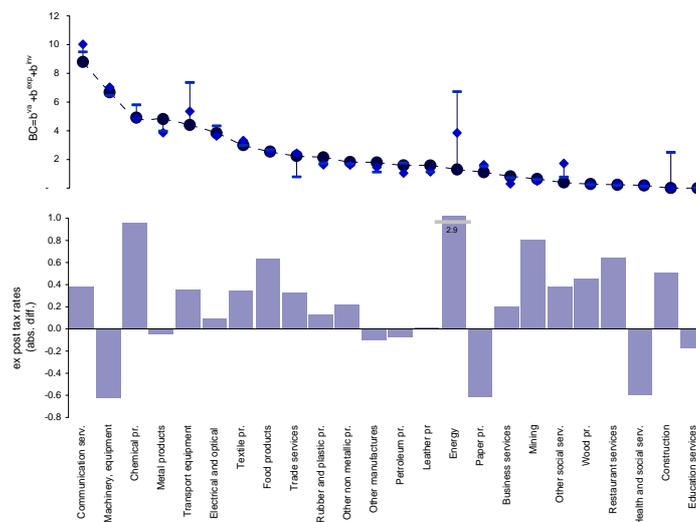
TABLE 5

Ex-post implicit tax rates: base-case scenario and reformed scenario. Breakdown by enterprise activity sector; percentage values

Activity sector	Number of companies (%)	Base-case scenario	Reformed scenario	Absolute differences
Mining	0,9	13.69	14.50	0.81
Manufacturing industry	43,4	19.36	19.37	0.01
Food products	4,3	10.13	10.76	0.64
Textile products	4,6	19.80	20.15	0.35
Leather products	1,4	14.73	14.75	0.02
Products of wood	1,0	14.99	15.45	0.46
Paper products	3,2	24.64	24.02	-0.61
Petroleum products	0,3	16.39	16.31	-0.07
Chemical products	3,2	18.60	19.57	0.96
Rubber and plastic products	1,9	18.50	18.63	0.13
Other non metallic mineral products	2,8	18.99	19.21	0.22
Basic metals and fabricated metal products	6,2	18.51	18.46	-0.05
Machinery and equipment	5,3	24.48	23.85	-0.63
Electrical and optical equipment	4,4	20.57	20.67	0.10
Transport equipment	2,0	20.99	21.35	0.36
Other manufactured goods	3,0	15.78	15.68	-0.10
Electricity, energy, gas, steam and water	1,2	20.32	23.23	2.91
Construction	3,8	17.64	18.14	0.51
Wholesale and retail trade services	15,1	19.08	19.41	0.33
Hotel and restaurant services	2,0	11.44	12.09	0.65
Transport, storage and communication services	7,3	17.62	18.01	0.39
Real estate, renting and business services	17,9	18.73	18.93	0.20
Education services	1,0	17.18	17.01	-0.18
Health and social work services	2,9	14.15	13.55	-0.60
Other social and personal services	4,3	10.38	10.77	0.39
Mean	100,0	18.01	18.27	0.26

FIGURE 2

Enterprise performance (Years: — 1996 ♦ 1998 ● 2000) and simulated ex-post tax rates changes by business sector



Source: authors' estimates

The effects of the reform are not homogeneous across sectors, both in their magnitude and in their sign. Indeed, firms in the 'Education' and in the 'Health and social services' sectors exhibit a reduction in the implicit tax rate, while companies in the remaining sectors show ex-post tax rate increases. The best performing sector, 'Transport and communication services', records and increase in the tax burden of about 0.4 percentage points.

Looking at the 'Manufacturing' industry as a whole, we see that the new regime leaves the implicit tax rate basically unchanged. We then note that some sub-sectors of the 'Manufacturing' industry actually benefit from the new system (as the 'Machinery and equipment' and the 'Paper products' sector), others bear higher tax rates (as for instance for the 'Chemical products'). The highest tax rate drop is recorded in the 'Machinery and equipment' sector (0.63 points), which, as shown by figure 3, is classified among the most competitive (best performing) sectors.

Considering now the magnitude of the tax rate increases for the main sector classification, we see that the highest rises occur in the sectors 'Electricity' (2.9 points) and 'Mining' (0.8 points). This is somewhat an expected finding as companies of these sectors, because of the dual-rate system, in the base-line record the lowest 'effective' statutory rates²⁵. Turning again to figure 3 we also note that in the period 1996-2000 companies of the sector 'Electricity, energy' show a decline in terms of competitiveness, as the performance indicator falls by over 2 percentage points.

Lastly, companies of the 'Health and social work' sector experience a substantial reduction (0.6 points) in the tax rate after the reform. This result can be explained, again, considering companies of this sector did not benefit largely from the DIT allowance, as in the base-line they show the highest 'effective' statutory rate.

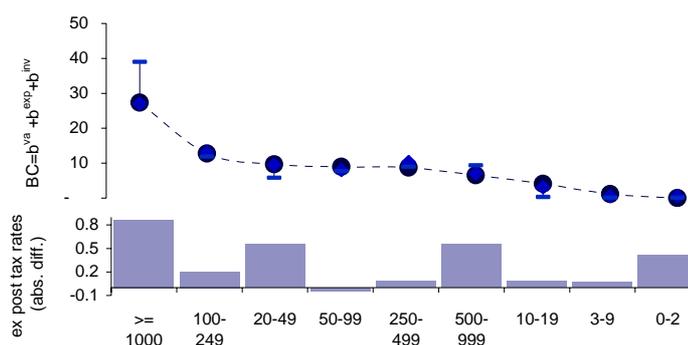
The effects of the 2004 reform as regards firm size are shown in table 6 and figure 3.

²⁵ It must be noted, however, that while in the 'Mining' industry the tax base rises by almost 1 percentage point, in the 'Electricity' sector the tax base falls by 4 points partially offsetting the increase in the rate of taxation for such companies provided by the reform.

TABLE 6
Ex-post implicit tax rates: base-case scenario and reformed scenario. Breakdown by classes of employees; percentage values

<i>Size</i>	<i>Number of companies (%)</i>	<i>Base-case scenario</i>	<i>Reformed scenario</i>	<i>Absolute differences</i>
From 1 to 2	15,1	16.64	17.06	0.42
From 3 to 9	17,4	17.75	17.83	0.08
From 10 to 19	17,2	19.67	19.75	0.09
From 20 to 49	13,8	22.03	22.58	0.56
From 50 to 99	6,3	23.22	23.18	-0.04
From 100 to 249	21,1	19.42	19.62	0.20
From 250 to 499	5,5	19.65	19.74	0.09
From 500 to 999	2,1	19.74	20.30	0.56
Above 999	1,5	22.43	23.30	0.87
Mean	100,0	18.01	18.27	0.26

FIGURE 3
Enterprise performance (Years: — 1996 ♦ 1998 • 2000) and simulated ex-post tax rates changes by classes of employees



Source: authors' estimates

In both scenarios implicit tax rates are variable across firm size²⁶ ranging from almost 17 points (firms with less than 3 workers) to 23 points (firms with a number of workers between 50 and 99). As one might have expected, figure 3 gives evidence that large companies (with at least 1000 employees) are the most competitive while small firms (up to 20 employees) show lower performance compared to companies of larger size.

One interesting result of the analysis is that firms benefiting from the reform are concentrated in the class of companies employing more than 49 and less than 100 workers, while all the remaining classes of firms exhibit a greater tax burden after the reform. The magnitude of such increases is different among firms of different size. The highest rise (0.87

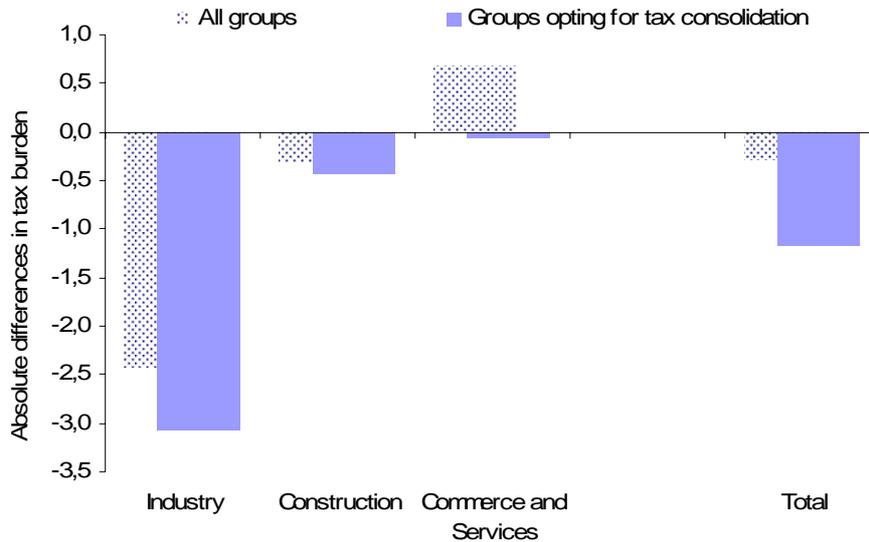
²⁶ For firms opting for group taxation, the number of workers refer to the aggregate number of employees of the firms electing to tax consolidation.

points) is recorded for large firms, employing at least 1000 workers, although very small firms, employing less than 3 workers, experience a significant increase in the tax burden as well (0.42 points). For very small firms, again, the result can be partially explained considering that in the base-case scenario these firms show greater benefits from the DIT system (in terms of a lower ‘effective’ statutory tax rate) compared to firms of larger size, and therefore actually experience an increase in the statutory rate of taxation after the reform.

The results discussed so far consider the overall effects of the corporate tax reform. To go deeper into the analysis of the impact of the reform on companies belonging to groups²⁷, figure 4 depicts the absolute variations of the estimated ex-post implicit tax rates both for firms part of groups and for groups opting for tax consolidation, by sector of activity²⁸.

FIGURE 4

Effects of the 2004 corporation tax reform for firms belonging to groups and for firms opting for tax consolidation: absolute variations of ex-post implicit tax rates by business sector; percentage values



Source: authors' estimates

In spite of the general result which as examined above shows an increase in the mean ex-post implicit corporate tax rate, for firms belonging to groups we obtain an opposite outcome: the tax reform lowers the mean tax burden on corporate groups by 0.29 points and by 1.18 points on groups opting for tax consolidation. Figure 4 shows that after the reform the implicit tax rate declines for groups in the ‘Industry’ sector by 2.4 points, in the ‘Construction’ sector by

²⁷ In the simulations we assume that companies opt for tax consolidation when the gross group tax in the new regime is lower than the tax due in the base-case. Results show that out of 1,776 parent companies (groups) present in the dataset 276 opt for tax consolidation, corresponding to a grossed-up figure of 4,273 enterprises when reported to the population.

²⁸ As implicit tax rates show in this case high variability across sectors as defined by the NACE classification, we consider the three main sector classification. The group sector of activity refers to that of the parent company.

0.3 points, while the 'Commerce and services' sector exhibits a tax rate increase of about 0.6 percentage points. Restricting the analysis on groups opting for tax consolidation we then find that the tax rate drops by 3.08 points for groups of the 'Industry' sector, by 0.43 points in the 'Construction' sector, while reduction for groups of the 'Commerce and services' sector is rather modest and amounts to 0.07 percentage points.

In conclusions, the consolidated tax regime lowers firms' tax burden and this might offer a strong incentive to companies to change their strategies and organisational behaviour in order to take advantage of the new system.

7. Conclusions

At the beginning of 2004 Italy engaged in a comprehensive reform of the corporation tax system under the general purpose, in the intentions of the policy maker, to simplify the tax treatment of firms as well as to reduce the firms' tax burden. The basic features of the new system were actually designed at the end of 2001 after the government was elected and were set forth in a Bill containing guidelines for a general reform of both direct and indirect taxation passed in the same year.

In this paper we have assessed the effects of the 2004 reform on firms' tax burden by comparing the new tax system with the pre-existing one. For this purpose we have build a microsimulation model reproducing in detail the corporate income tax and the provisions system on firms. The model is based on an integrated dataset combining data of the year 2000 from the PMI survey, regarding firms with less than 100 workers, and from the SCI survey, covering firms with more than 99 employees, both collected yearly by the Italian Institute of Statistics (ISTAT), with company accounts. Data do not cover firms of the 'Agriculture, fishing' sector, of the Public sector, as well as financial companies which are therefore excluded from the analysis.

In the empirical analysis we have considered two policy scenarios. The base-line replicates the structure of the corporate tax system in place in July 2001, when a dual-rate scheme (the so-called Dual Income Tax) offering a reduced rate (19% rather than 36%) on that part of profits deemed to be derived from capital increases was present, just before some changes to this system were enacted in order to reduce its effects. Indeed, the new corporation tax system moves back to a single-rate scheme, with a rate of taxation of 33%, brings in some changes to the definition of the tax base by exempting corporate dividends and symmetrically removing the dividend tax relief, by exempting capital gains from long term assets owned for at least one year, by limiting deductibility of interest costs provided under thin capitalisation rules. The reform also introduces an optional consolidated tax statement for groups that can be extended to foreign subsidiaries.

To analyse the impact of the reform we have estimated ex-post implicit tax rates computed as ratios of the simulated tax dues on operating surplus. The effects of the reform depend both on the 'effective' statutory tax rate prevailing in the base-case scenario given by the DIT mechanism compared to the uniform rate of 33%, and on the modifications in the definition of the tax base provided by the new regime. The overall results show an increase in the mean tax burden of 0.26 percentage points, although the effects of the reform, both in the sign and in the magnitude of the implicit tax rate variations, are not homogeneous across sectors.

Concentrating the analysis on corporate groups, we then find evidence that the new system favours firms belonging to groups where the average ex-post tax rate drops by 0.3 points and by almost 1.2 points for firms opting for tax consolidation. Therefore we conclude that the new regime might offer a strong impulse to companies to change their strategic behaviour in order to take advantage of the consolidated tax system.

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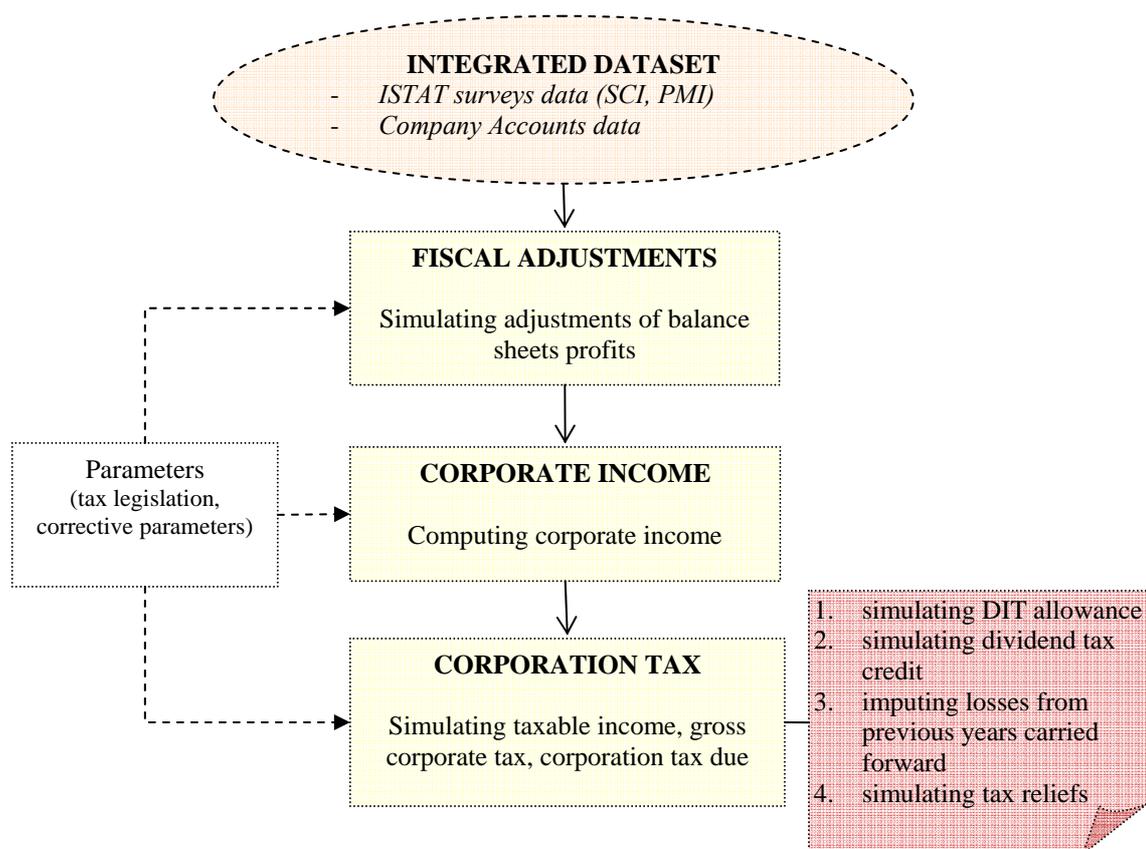
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Appendix. The microsimulation model

Figure 1.A shows the basic structure of the Corporate Tax Model (CTM). The CTM is part of an integrated model currently simulating social insurance contributions paid by enterprises, IRAP, and excises from 1998 to 2000²⁹.

FIGURE 1.A

The structure of the microsimulation model



The CTM is built following a modular structure and the order in which these sub-modules are implemented obviously reflects the corporation income tax rules. The main building blocks of the CTM are the routines Fiscal Adjustments, Corporate Income, Corporate Tax which run sequentially.

In Italy, as in many other countries, the corporate tax base is obtained from the profit (loss) resulting from the company balance sheet adjusted for tax purposes. These adjustments

²⁹ The IRAP, social insurance contributions, excises modules were built at the University of Florence within the DIECOFIS project. In this case the model runs on both corporate and unincorporated enterprises. For a description of the methodology used in building the integrated model as well as the possible interactions of the single modules see Bardazzi, Parisi, Paziienza (2004).

reflect the reconstruction of corporate income for tax purposes. Usually, accounts data are not detailed enough to allow simulation of such fiscal adjustments and therefore to exactly estimate the corporate tax base. Fiscal adjustments that cannot be modelled on the basis of the available data are imputed using parameters computed on the basis of the corporate tax returns micro data collected by ISTAT for a sample of firms³⁰. The same procedure is used to impute other items, for instance provisions, deductions allowed by the tax law that cannot be modelled from the available data.

In order the model simulates³¹: profits eligible to the DIT allowance, the dividend tax credit, fiscal losses from the previous periods brought forward, imputed on the basis of parameters computed from the tax returns micro data, the main tax reliefs provided by the Italian tax system (specifically for innovative investments, for research expenses, for job creation, the tax relief for small enterprises of the ‘Commerce and tourism’ sector). Final output of the module contains the main variables generated within the corporate tax module, that is taxable income, allowable DIT income, tax reliefs, gross tax, tax due. At intermediate levels, the model also generates variables reflecting eligible amounts of specific allowances that companies can bring forward to the next or the following years, whenever companies do not benefit for the full amount. This is the case of the fiscal loss of the year, income eligible to the reduced rate provided by the DIT system, tax reliefs.

In order to get a precise picture of the model performance in reproducing the corporate tax system, model outputs are validated against tax returns micro-data. Table 11 displays the (un-weighted) mean amounts of taxable income, gross corporate tax, corporate tax due estimated by the model and the amounts calculated from the tax returns, along with the percentage differences.

³⁰ This sample includes about 5279 corporations and is representative of the population covered by the SCI and by the PMI surveys.

³¹ Without going into further details, taxable income is obtained by adding the dividend tax credit to the adjusted corporate income and by deducting losses from the previous periods that can be brought forward up to five years. Taxable income is then split into two components on the basis of the DIT allowance and the gross tax is computed by applying the prevailing tax rates. Finally, the corporate tax due is obtained by subtracting tax reliefs and the dividend tax credit from the gross tax.

TABLE 11

Comparison between model estimates and tax returns data; mean amounts (euros) and percentage differences; year 2000

	<i>Model output</i>	<i>Tax returns data</i>	<i>% differences</i>
Taxable income	1,174,286	1,121,892	4.46
Gross corporate tax	425,294	404,906	4.79
Corporate tax due	383,671	368,913	3.85

Source: authors' estimates and computations from the 2000 corporate tax returns micro data

As it appears, the model overestimates the corporate tax due by only 3,9% and this shows that the microsimulation model's fit is very good.