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CORPORATE FINANCING DECISIONS AND NON DEBT TAX SHIELDS: EVIDENCE FROM ITALIAN EXPERIENCES IN THE 1990s

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Corporate financing decisions and non debt tax shields:
Evidence from Italian experiences in the 1990s

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Abstract

Between 1995 and 1999, Italy experienced three episodes of fiscal reforms during which different categories of non debt tax shields were introduced, including a classical investment tax credit, a system of dual income taxation, and an investment tax credit restricted to equity financed investments. Using balance sheets of a large sample of Italian firms, we construct a data-set which allows us to evaluate the impact of the different fiscal interventions. We apply MacKie-Mason's (1990) method to study incremental financing decisions using discrete choice analysis. Our investigation shows that the measures introduced were successful to reduce the advantage of debt financing relative to equity financing; it also allows to identify which measure was more effective. We relate our findings to the current literature on the determinants of capital structure.

Keywords: Non debt tax shieldsds, investment tax credits, dual income tax

JEL: G32, H25

1 Introduction

During the 1990s, Italy went through several episodes of fiscal reforms. For various reasons, however, these have not yet taken the form of a coherent design to increase the efficiency and the fairness of a system which was introduced in the early seventies. Among, however, the various episodes of reforms, there have been three concerning business taxation which we believe offer quite interesting field experiments to study the effects on corporate financing decisions of different types of non-debt-tax-shields.

The first episode occurred in 1995, when a temporary investment tax credit was for the first time introduced in the Italian fiscal system. As it is well known, since DeAngelo and Masulis (1980), investment tax credits have been considered by the academic literature as a theoretically important non debt tax shield, acting together with depreciation allowances

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and tax loss carryforward, as a substitute for interest deduction in lowering firms' effective marginal tax rates. The empirical evidence on the actual effect of investment tax credits is, however, more controversial (see MacKie-Mason 1990, Trezevant 1992, and Graham 1996a). One of the aims of this paper is to provide fresh evidence on this issue, focussing on this recent Italian experience.

The objective of influencing capital structure, in particular in an attempt to encourage the use of equity relative to debt, was explicit in a major reform of business taxation, carried out in 1996 by the centre-left government and come into force in 1998. The reform consisted into two main interventions. On the one side, some old taxes discouraging the use of equity capital have been replaced by a new tax, which does not allow for interest payments deduction. On the other side, following a wave started in the Nordic countries (see Sorensen 1998), the reform introduced in Italy a system of dual income taxation for firms, according to which profits accredited to equity capital have a fiscal advantage in terms of a reduced tax rate.

Though formally abandoned in 2001 by the new centre-right government, the Italian Dit represents a quite interesting experiment of a tax legislation built on the idea that, in order to promote tax neutrality in corporate financing strategies, the opportunity cost of equity finance should receive a similar (if not identical) tax allowance as that given to the services of debt[1]. A second aim of this paper is to provide evidence also in regard to this explicit form of non debt tax shield.

A third episode which we investigate concerns a particular form of investment tax credit, which was passed in 1999 and which was close in spirit to the 1998's reform, since it consisted in a tax rebate restricted to new equity financed investments.

The three episodes are investigated following the technique proposed by MacKie-Mason (1990), based on discrete choice analysis of incremental financial decisions. For each of the three episodes of reform, we estimate a logit model in which the choice of issuing debt over equity is converted into a zero-one dependent variable. Non debt tax shields, including those activated by the tax reforms alluded to above, enter directly among other regressors, together with other variables which have at various times been suggested in the literature as possible important elements in influencing corporate financing decisions. Among the others, we include variables related to asymmetric information and agency problems (pecking order and free cash flow theories), to financial distress costs, to institutional characteristics[2].

Our results show that the introduction of Dit system in 1998 had a quite effective impact in reducing firms' preference for debt financing. At the same time, we document that also the other non debt tax shields introduced in the 1990s generated substitution effects, including the 1995 classical type of investment tax credit. Other tax and non tax variables which have turned out to be relevant in our investigations on the capital structure of Italian companies will be discussed in due course.

[1] The Italian Dit shares in fact many features in common with the proposal of the so called 'Allowance for corporate equity' (Ace), firstly advanced in the UK by the IFS (Gammie 1991). For a thorough discussion on the relationship between the Italian Dit and the Ace proposal see Bordignon et al. (2001).

[2] Since Modigliani and Miller (1958), the literature on corporate financing has generated an ever growing amount of work, in which the effect of taxes is only one of the issues considered. Seminal contributions in other aspects of the theory include: Jensen and Meckling (1976), Myers (1977), Scott (1977), Myers and Majluf (1984), Jensen (1986), Titman and Wessels (1988). We will discuss in more detailed some of the issues considered throughout the paper and when we will comment our empirical results.

The rest of the paper is organized as follows. In Section 2, we present the main features of corporate taxation in Italy during the 1990s. Next, in Section 3, we outline the main ingredients of our empirical approach, focussing in particular on the effects we expect from the non debt tax shields entered by the reforms. In Section 4, we present our data and the construction of the variables used in the regressions. The results are given in Section 5. Section 6 summarizes and draws conclusions.

2 Corporate taxation in Italy during the 1990s

In this section we briefly report the evolution of corporate taxation in Italy during the 1990s. We focus on the characteristics of the system and of the interventions which are more relevant for the present analysis; a more detailed accounts of the evolution of corporate taxation in Italy in the early 1990s can be found in Alworth and Arachi (2001), while a more comprehensive discussion of the reforms carried out in the late 1990s is in Bordignon et al. (2001).

In 1994, at the eve of the first intervention considered in this paper, profits of Italian corporate firms were subject to two basic taxes: a corporate income tax levied at a rate of 37 per cent, called Irpeg ("imposta sul reddito delle persone giuridiche"); and a so-called local income tax, Ilor ("imposta locale sul reddito"), which was in fact a tax on profits, also levied at a uniform tax rate of 16.2 per cent. Ilor was for many years fully or partially deductible from Irpeg, but since 1993 deductibility was completely removed so that the overall statutory tax rate on corporate profits rose to 53.2 per cent. In addition, since 1992, a tax on business net worth was introduced at a rate of 0.75 per cent, firstly as a temporary measure; but then continuously renewed over time for revenue reasons.

The standard tax shields offered by the system in face of the statutory tax rates were depreciation allowances, provisions covering losses and interest deductions. The fiscal discipline concerning depreciation allowances differs from that considered by the civil law, allowing for so called "anticipated" depreciation which enable firms to benefit of increased allowances for capital purchases in the first three years (though, since the end of the 1980s, this discipline has been made progressively less favorable for firms). Losses can be carryforward against Irpeg and used to reduce future taxable income for up to 5 years; they could not, however, be carried forward when calculating Ilor. Interest payments are completely deductible, to the extent at least they can be considered a cost in the determination of taxable income[3].

The first intervention we will investigate in our empirical analysis is a temporary investment tax credit passed in 1995 and called "Legge Termonti", after the name of the Ministry of Finance of the centre-right government which was in power at the time. The main objective of the intervention was to stimulate the economy. The credit could be carryforward for up to five years. An important point to stress is the magnitude of the credit, which amounted to the 50% of the investment realized in the year, in excess to the mean of the investments carried out in the previous five years. As a measure of comparison, consider that until it was repealed by the Tax Reform Act in 1986 (and the

[3]More specifically, interest payments can be deduced from taxable income in a proportion determined by the ratio between all the revenues concurring in the determination of taxable income and total revenues (inclusive those tax-free).

loss of the benefits compensated by a general reduction of the statutory tax rate), in the US firms could accumulate investment tax credits of approximately 7% of capital investment, though the credit could be carried forward for a much longer period, namely up to 15 years[4].

In 1996, following the victory in the political election, the new centre-left government launched a fiscal reform, which, in the intention of Mr. Visco, the new Ministry of Finance, aimed to affect all the main aspects of the Italian fiscal system. In regard in particular to the topic of the present paper, the 1998 reform first of all substituted Ilor and the tax on net worth with a new regional tax, called Irap ("imposta regional sulle attività produttive"), which is neutral with respect to the firms' financing options, since it includes interest payments in the determination of the tax base[5].

In addition (and more importantly in regard to our empirical investigations), the 1998 reform also introduced an explicit non-debt-tax-shields for Italian companies consisting in a dual system of taxation called Dit (or Italian Dit). According to the new system, companies' profits are divided into two parts. One part, called "ordinary income", is computed multiplying "new equity capital" by a nominal rate of return established yearly by the law on the basis of the market interest rate on public and private bonds[6]. "New equity capital" is define as equity capital generated by both subscriptions and retained earnings since 1996, when the reform was firstly presented by the government. Ordinary income is clearly thought to approximate the opportunity cost of financing with equity capital. Accordingly, it is taxed to a concessionary tax rate of 19%. The residual income component, called "extra-profit", is taxed at the normal rate of 37%. A lowest limit is imposed on the whole average tax rate, which cannot fall below 27%.

In addition of reducing the losses of tax revenues, an other motivation for imposing such lowest limit to the average tax rate was to control for the fiscal discrimination that the Italian dual system could generate against old and highly capitalized companies, in favour of the newly founded ones. Indeed, given the constraint in the computation of the ordinary return to new equity capital (which also had its major motivation in limiting tax revenue losses, while preserving firms' incentives to increase equity financing), the latter companies could obtained very high tax reduction, while the benefit for the former in the short-run was considered very limited.

Partly to overcome this problem (and partly to stimulate the economy), in 1999 the government also passed an investment tax credit, which in line with the general reform design, was restricted to equity financed investments. The "Visco" investment tax credit accords the preferential tax rate of 19% to an amount of profits equals to the investments carried out with new equity financing or retained earnings. It was established that the fiscal benefit could be added to the Dit allowances (within the limit of the 27 per cent of

[4] As we shall argue below, the length of the period up to which investment tax credits can be carried forwards in the future is an important element for determining the effect of a fiscal reform. In particular, the longer is the period, the smoother the transition to a new system and less transitory the effect of investment tax credits as potential non debt tax shield.

[5] This feature makes in particular Irap similar to a model of Comprehensive Business Income Taxation, as firstly proposed for the US by the Treasury Department (1992) and more recently also advocated by some (see e.g. Bond 2002) for the EU countries as a whole. An important difference between a pure model of Comprehensive Business Income Taxation and Irap, however, is that labour costs are deductible in the case of the former, but not of the latter. (For a thorough discussion on Irap, see Bordignon et al. 2001).

[6] This rate may be augmented up to three percentage points as a risk premium.

the average tax rate). The "Visco" tax credit was thought as a temporary measure (to last until 2001) to speed and accelerate the transition towards a system that, eventually, should have applied the ordinary return to all equity capital[7].

Other measures to speed up the process were also introduced in 2000 and 2001, and others were planned for 2002 and 2003. In spring 2001, however, the centre-right coalition has won back the political election and the Dit system has been formally repealed and substituted by a new edition of the "Tremonti" tax credit[8]. For a certain period (at the moment established up to 2003), firms will nevertheless have the possibility to opt for the system which they found more convenient.

3 Taxes in modelling corporate financing decisions

Various techniques have been explored in the literature to estimate the impact of the tax structure on corporate financing decision; none, however, has been proven completely exempt of possible criticism. In fact, just after DeAngelo and Masulis (1980) refuted the tax neutrality result of Miller (1977), various empirical studies (among whom Marsh 1982, Bradley et al. 1984, Titman and Wessels 1988) were conducted to test the new predictions of non neutrality. Most of this first wave of investigations looked at the debt equity ratio and expected a negative impact on the former of the various non debt tax shields indicated by DeAngelo and Masulis (1980), including depreciation allowances, tax loss carryforward and investment tax credits. These studies however failed to find any significant or systematic effect for the tax variables. In an influential paper, MacKie-Mason (1990) contributed to explain the reasons. In this section we review MacKie-Mason's (1990) arguments and reconsider his approach to address the issue. Our purpose is to explain why we have preferred his approach to some of its most prominent alternatives[9].

3.1 Tax shields as proxies for the marginal tax rate

A first argument developed by MacKie-Mason (1990) was to stress that the substitution effect pointed by DeAngelo and Masulis (1990) works only indirectly via the firm's effective marginal tax rate, the latter defined as the present value of current and expected future taxes paid on an additional unit of income earned today. Using tax shields as proxies for the tax rate in the empirical analyses may, however, produce some confounding effects. He specifically insisted that we should in general expect higher investment tax credits to be associated with more profitable firms and, from there, with higher, rather than lower,

[7] Among other measures, we in particular recall a so called super-Dit, according to which corporations have been allowed in 2000 and 2001 to compute the ordinary return on new equity and retained earnings, by a multiple of 1.2 and 1.4, respectively, of their actual values.

[8] Two main reasons explain the disappointment of the centre-right government for the Dit system: firstly, it is considered too complex to be applied by most firms, in particular by those of the non-corporate sector, which besides constituting a substantial share of the Italian economy (absorbing more than 47% of employed labour according to some estimates), represents also the main electoral basin of the centre-right coalition; secondly, it is viewed too slow in regard of the objective of reducing the average tax rates on business, which remains the main aim of the centre-right government.

[9] In this section, indeed, we consider only problems related to the choice of the proxies for the marginal tax rates and the determination of the dependent variable. The way in which we have dealt with other well known problems in this literature, including that of the endogenity bias of the (proxies of the) marginal tax rate itself, will be discussed in the next section.

marginal tax rates. In addition, he noted that for many firms the effect of tax shields, via the marginal tax rate, may be too small to reveal empirically on debt financing. The reason is that tax shields affect the marginal tax rate by increasing the probability of tax exhaustion. In particular, "only when a firm is close to exhausting its taxable income is an additional dollar of investment tax credit very likely to crowd out a dollar of interest deductions, substantially reducing the value of debt" (MacKie-Mason 1990, p. 1474).

He therefore suggested to control for the profitability of firms when testing for substitution effects. He proposed the separation of non debt tax shields into two categories: those like tax loss carryforward, expected to generate always a negative relationship with debt financing and that can therefore enter in empirical analyses as stand-alone variables; and those like investment tax credits which may have ambiguous effects. When in particular these latter are included as stand-alone variables, they may have a positive relationship with debt, to the extent at least that profitability is positively associated with debt financing (as suggested by arguments based on financial distress costs; see below). For firms close to the tax exhaustion, on the other hand, the substitution effect of investment tax credit should reveal also on the empirical ground. He therefore suggested to take the firm's distance from tax exhaustion into account when testing for the substitution effect of investment tax credit. He modelled such distance making investment tax credit to interact with a variables indicating how close a firm is to tax exhaustion. His empirical estimates supported the above intuition.

The relationships between tax shields and marginal tax rates have been developed further in important subsequent works. Graham (1996a), in particular, expanding a method first employed by Shevlin (1990), tested whether the use of debt was positively related to simulated firm-specific marginal tax rates, which accounted for various tax shields including operating losses and investment tax credits. In a companion paper, Graham (1996b) also showed that simulated tax rates were the best proxy for the "true" marginal tax rate and clearly outperformed several alternative measurers used by previous studies, including proxies based on direct use of non debt tax shields.

Simulated marginal tax rates, however, may also have problems. In particular, as stressed by Graham (1996b), they involve "measuring managers' tax rate expectations at the time debt policy choices are made" (p. 44). This is obviously not an easy task in general, though Graham (1996b) is convincing to propose a method reliable for periods of relatively stable tax legislation[10]: indeed, the simulated marginal tax rates approach has also been fruitfully applied in a recent study of Italian corporate financing decisions for the pre-reform period 1980-1994 (Alworth and Arachi 2001). But, we believe, the task becomes virtually impossible for periods of continuous fiscal reforms, like those which Italy experimented in the second half of the 1990s and it is in fact still experiencing. In this regard, we just recall that the 1998 reform should have in principle been taken as a long-term reform; but, it was firstly reinforced in 1999, and then substantially abandoned since 2001. Similarly, the investment tax credit introduced in 1995 was considered a temporary measure; though it has been then replicated in 1999 (even if in a slightly different form) and again in 2001 (in essentially the same form).

Considerations of the fiscal contexts in which non debt tax shields are analyzed may

[10] In fact, the main aim of simulated firm-specific marginal rates is precisely that of introducing sufficient cross-section and/or time-series variation in the data (necessary to empirically identify the impact of taxation on financing decision), in face of quite stable statutory tax rates and tax legislation more generally.

also induce a reassessment of their possible empirical impact. In particular, the profitability effect pointed out by MacKie-Mason (1991) may be substantially reduced when investment tax credits are introduced as a temporary measure, because all firms (and not only those with high profits) will wish to benefit of the temporary tax reduction. As a result, high investment tax credits may be no longer associated with high marginal tax rates (as in the case in which they are a permanent characteristic of the tax legislation). In addition, as noted in the previous section, when investment tax credits are introduced as a measure to stimulate the economy, as in the 1995 and 1999 Italian experiences, they typically are of a sizable dimension (on this point see also below). As such, their effect as substitutes for interest deduction may reveal empirically even for firms which aren't close to the tax exhaustion. In fact, in our investigations, although we find evidence of the substitution effects, we don't find evidence for the tax exhaustion hypothesis[11]. Furthermore, it is perhaps just worthwhile noticing that, to the extent that investment tax credits actually generate substitution effects, it doesn't really matter whether the credits are formally restricted to equity financing (as in the 1999 "Visco" tax credit) or not (as in the 1995 "Tremonti" case).

3.2 The logit approach

An other difficulty pointed out by MacKie-Mason (1990) in regard to the first wave of studies related to the use of debt/equity ratio as dependent variable. One problem with such an approach is that it may be subject to specification biases in the extent to which profit maximization does not necessarily yield to an optimal long-term leverage ratio, as suggested by some theories. Even most importantly, the presence of adjustment costs would in any case require to model an explicit dynamic specification for the firms' target debt level[12]. Alternatively, one can use an incremental choice approach, which only considers new financing decisions.

In particular, following MacKie-Mason (1990), in this paper we use a logit model in which the dependent variable takes the value of 1 if, in the reference year, the firm finances itself mainly with debt and 0 if the firm finances itself mainly with equity. The financing is considered 'mainly' with debt if new debt represents more than 50% of new total funds, and 'mainly' with equity if more than 50% of financing is made up by new equity capital. Financial debt refers to bonds, convertible bonds, due to banks and due to other providers of finance, while new equity capital refers to the increase in the shareholders funds net of dividends payments.

A valuable feature of the logit model is that it allows a direct interpretation of the impact of the regressors, in general, and of the non debt tax shields, in particular, in terms of variations in the probability of choosing debt financing over equity financing[13].

[11] Testing the impact of taxes on company financing decisions using responses to a tax law change has also been employed by some previous studies, including Givoly et al. (1992) and Trezevant (1992). The latter, in particular, looked at firms' responses to the Economic Recovery Tax act of 1981 in the US to explicitly test for the substitution effect and the tax exhaustion hypothesis. He found strong empirical support for both effects; however, the Economic recovery Act introduced a permanent, rather than temporary, fiscal change.

[12] For a recent application of such an approach see de Miguel and Pindado (2001).

[13] Conversely, one may object that firms' choices are more complex than those underlying the binary variable of the logit approach, perhaps expecting many firms using both debt and equity in substantial

Indeed, as it well known, the logit model is also called random utility model. The hypothesis underlying the approach is that a firm chooses the financing instruments comparing the utilities provided by each of them. Let us call U_d the utility from choosing mainly debt and U_e the utility from choosing mainly equity. U_d and U_e are not observable, but the observed choice between the two reveals which one provides the greater utility. Thus, we define a variable y such that

$$y = \begin{cases} 1 \text{ if } U_d > U_e \\ 0 \text{ if } U_d < U_e \end{cases}$$

We observe $y = 1$ and $y = 0$ when, respectively, debt and equity are chosen. If utility depends on a set of observable factors x and on a random term ε, such that

$$\begin{aligned} U_d &= \beta_d' x + \varepsilon_d \text{ and} \\ U_e &= \beta_e' x + \varepsilon_e \end{aligned}$$

then we have:

$$\begin{aligned} prob[y = 1] &= prob[U_d > U_e] = prob[\beta_d' x + \varepsilon_d - \beta_e' x - \varepsilon_e > 0|x] \\ &= prob[(\beta_d' - \beta_e')x + (\varepsilon_d - \varepsilon_e) > 0|x] = prob[\beta' x + \varepsilon > 0|x] \end{aligned}$$

Assuming that ε has a logistic distribution and since the logistic distribution is symmetric, then:

$$Prob[y = 1] = F(\beta' x) = \frac{\exp(\beta' x)}{1 + \exp(\beta' x)}$$

which provides the underlying structural model for the probability.

4 Data and models specification

Having outlined the general philosophy of our empirical approach, in this section we present the specific regression relationships we study, the data-set we use and the constructions and summary statistics of the variables.

4.1 Data set and dependent variable

We study firms financial choices at the time of the three reforms in 1995, 1998 and 1999, treated as three independent episodes. More specifically, the data used for our regressions are taken from the data set AIDA[14]. This data base records the balance sheets of Italian companies from 1993 onwards with the exception of financial firms. We select corporate firms from manufacturing sector and we constructed three cross sections for the three years of reform.

proportions. However, as it will in particular be shown in the next section, the distribution of firms' choice between equity financing and debt financing is in fact quite supportive of a simple binary decision.

[14] Bureau van Dijk, Electronic Publishing, Novcredi 2001.

The sample of companies included in AIDA expanded over time from approximately 3800 firms in 1993 to 45500 in 2000. Since to generate the variables included in the models it is necessary to use information taken from the balance sheets relative to two years before and one year after the choice, we excluded from the samples firms with missing values in any of the four years around each reform[15]. As a result, the samples to study the three episodes are respectively based on 1213 firms in 1995, 25391 in 1998 and 22839 in 1999.

To construct the dependent variable of the logit model, we considered that a company issue new debt in a given year t if:

$$FD^{st}_{t} + FD^{lt}_{t} - FD^{lt}_{t-1} > 0$$

where FD^{st} represents short term financial debt and FD^{lt} represents long term financial debt. Financial debt refers to the book value of bonds, convertible bonds, due to banks and due to other providers of finance.

Equity financing occurs if, in a given year t:

$$(SF_{t} - DIV_{t}) - (SF_{t-1} - DIV_{t-1}) > 0$$

where SF is the book value of total shareholders funds and DIV represents the paid dividends. Since the balance sheet does not report the amount of paid dividends, we estimated them assuming that the amount of paid dividends corresponds to net income diminished by the increase in the reserves.

Figure 1 shows the distribution of the shares of total financing made up in each year of reform by new debt and/or by new equity (the ten classes on the horizontal axis classify firms according to the share of total financing placed on debt, with class 1 corresponding to a share equal or lower than 10% and class 10 to a share greater than 90%). As it can be seen, firms' choices are characterized by a very strong polarization: in all the three samples used for the estimation, the vast majority of firms (more than 80%) finance themselves either issuing only debt (class 10) or only equity (class 1); moreover, only a minority of firms (roughly 5-7%) uses both debt and equity in similar proportions (say, between 40 to 60 per cent, classes 4, 5 and 6).

4.2 Regressors and expected relationships

In Table 1 we summarize the explanatory variables used in the regression and give some details about how they have been constructed implementing specific procedures from the data set AIDA. We separate our presentation between tax variables[16] and other factors.

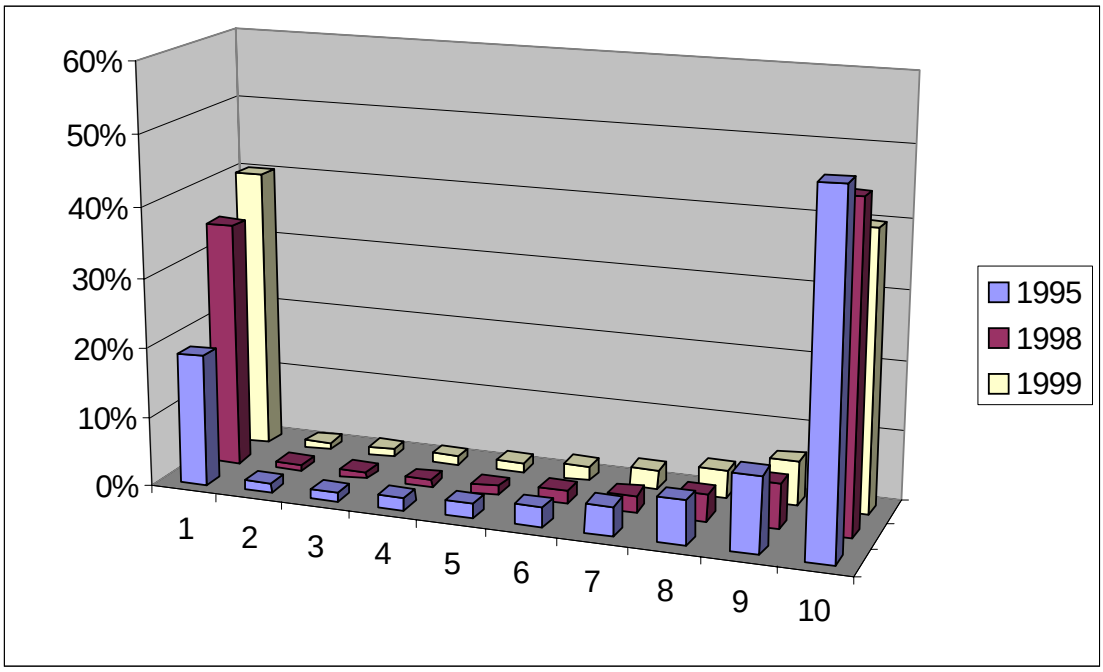
4.2.1 Tax variables

Following MacKie-Mason's (1990) approach, we have in particular identified the non debt tax shields (NDTS) to be used as proxies for the marginal tax rates at the time of the

[15] More specifically, the 1995, 1998 and 1999 regressions are based on samples of firms present continuously in the data set over the periods: 1993-1996, 1996-1999 and 1997-2000.

[16] It should be mentioned that, as in most previous empirical studies, our regressions do not take account for personal taxation. The main reason for this omission is that modelling the effect of personal taxation on companies financing decisions typically require (possibly arbitrary) assumptions to identify the marginal tax rates for different categories of representative taxpayers.

Figure 1: Distribution of firms' choices between debt financing and equity financing



three regressions[17] (1995, 1998, 1999).

These include, for all the three models estimated, the pre-reforms NDTS represented by tax loss carryforward (TLC) and tax deduction for depreciation ($DEPR$) (see Table 1). As anticipated, in Italy the loss can be carried forward and used to reduce future taxable income for up to 5 years. For this reason, unused losses can be added to current year losses. In our estimation, however, we could carry forward losses for 2 years only, because limitation in the data[18]. As a measure of depreciation allowances we entered the book values (see Table 1). It should be recalled, however, that depreciation for tax purposes differs from the one reported in the balance sheet (mainly because of the mechanism of "anticipated" depreciation). Still, the latter may be considered a good observable indicator of the effective tax shield.

As other main tax variable, to in particular capture the impact of the NDTS introduced

[17]It should be emphasized that our modelling strategies is explicitly designed to focus on the effect of the non debt tax shields introduced with the reforms. For this reason, the Irap is not included in our regressions. This may surprise some readers, given that one of the main objectives of the Irap reform was in fact to discourage debt financing. Recall, however, that the essence of the reform was the substitution of two taxes (Ilor and the tax on net worth) considered as giving a large advantage to debt, with a new tax neutral in regard to financing decisions. Thus, if from the one side companies had clearly a greater advantage to issue new debt before the reform than after the reform; from the other side, however, the Irap itself has no influence on the firms' financing decisions following the reform.

[18]To calculate tax loss carryforward, we built a model that allows firms to carry forward losses that have not been exploited to reduce taxable income in the previous years. The procedure is fully described in Gavana et al. (2001).

with the three episodes of reform, we considered separately:

a. the "Tremonti" investment tax credit ($TITC$) in the 1995 regression;

b. the Dual Income Taxation system (DIT) in the 1998 and 1999 regressions;

c. the "Visco" Investment Tax Credit ($VITC$) in the 1999 regression.

All NDTS entered as continuos variables measuring the current year amount of tax reductions; they have been normalized with respect to total firm's assets (see Table 1).

As previously mentioned, the Tremonti tax credit provides that 50% of investment realized in excess of the mean of the previous 5 years can be used to reduce the taxable income up to five years in the future. Because of a lack of data, in the construction of the regressor $TITC$ (see Table 1), we use the difference between the value of investment in 1995 and in 1994 as a proxy for the effective amount of the tax credit. The variable $TITC$[19] is also adjusted in order to consider firms' tax status. For example, if a firm had zero taxable income before the tax credit, there is no fiscal advantage for the current year and the firm can carry it forward for 5 years.

To model the Dual income tax allowance $DITS$ (see Table 1), we split the corporate taxable income into two components: the ordinary income taxed at the rate of 19% and the residual income taxed at the ordinary corporate tax rate of 37%. Moreover, the $DITS$ regressor takes into account that the average tax rate on profits cannot be lower than 27 percent and that, if the ordinary income is higher than the total shareholders funds, the tax rate of 19% is applied to an amount corresponding to the total shareholders funds. The variable is lagged to avoid simultaneity bias[20].

The Visco investment tax credit, $VITC$ in Table 1, has been introduced to encourage firms capitalization, with the aim of strengthening the DIT mechanism. Thus, the Visco incentive and the DIT mechanism interact in determining the firms fiscal burden. For this reason, to correctly quantify the impact of the Visco tax credit, we entered a variable ($VITC$) given by the difference between the tax reduction obtained when both mechanisms (DIT and Visco) operated, and the one obtained when only the DIT mechanism worked. Besides, since the Visco fiscal incentive was accorded only to equity financed investment, the variable is one year lagged to avoid simultaneity bias. However, as the $VITC$ was not operating in 1998, we calculated the potential allowance for 1998 and entered it in the model as an instrumental variable. Finally, the variable is constructed considering that when firms are tax exhausted they can carry forward the fiscal incentive for a maximum period of 5 years and that the $VICT$ modifies the procedure to calculate the 27% average rate constraint[21].

[19] In Table 1, 0.37 is the statutory tax rate in 1995 and INV represents the firm's gross investment, calculated as the change in the book value of tangible and intangible fixed assets between 1995 and 1994, plus the accumulated book depreciation for 1995.

[20] In regard to the actual construction of the variable DITS in Table 1, DIT is the ordinary income levied at 19%, BIM is the corporate taxable income and ta is the average tax rate; 0.27 is the limit imposed on the average tax rate. It follows that, if the average tax rate (ta) is higher than 27 percent, the tax reduction is given by the difference between the statutory tax rate (37%) and the privileged one (19%) multiplied by the ordinary income (DIT). Otherwise, if the average tax rate is below 27 percent, the whole corporate taxable income (BIM) is taxed at a rate of 27%. In this case, the tax reduction is measured by the difference between the statutory tax rate (37%) and the established minimum average tax rate (27%) multiplied by the corporate taxable income (BIM).

[21] In the expression for VITC in Table 1, 0.37 is once again the statutory tax rate for 1998, 0.19 is the privileged tax rate, INV is the firm's investment. In this case, investment is net of the accumulated depreciation for the year t, excluding the amount of depreciation corresponding to the current year investment.

Table 1: Explanatory variables and their definition

Variable	Acronym	Definition
"Tremonti" investment tax credit	TITC	$\frac{0.5\times 0.37\times(INV_{1995}-INV_{1994})}{\text{total assets}}$
DIT tax allowances	DITS	$\frac{(0.37-0.19)\times DIT}{\text{total assets}}$ if ta>0.27 ; $\frac{0.10\times BIM}{\text{total assets}}$ if ta<0.27
"Visco" investment tax credit	VITC	$\frac{(0.37-0.19)\times \min[INV;\Delta K]}{\text{total assets}}$
Tax loss carryforward	TLC	$\frac{\text{estimated tax loss carryforward}}{\text{total assets}}$
Depreciation allowances	DEPR	$\frac{\text{book value of depreciation of tang. and intang. assets}}{\text{total assets}}$
DIT allowances carryforward	CF	$\frac{\text{estimated DITS carryforward}}{\text{total assets}}$
Tangible fixed assets	TFA	$\frac{\text{book value of tangible fixed assets}}{\text{total assets}}$
Intangible fixed assets	IFA	$\frac{\text{book value of intangible assets}}{\text{total assets}}$
'True' productivity of firm's assets	EBIT	$\frac{\text{earnings before interests and taxes}}{\text{total assets}}$
Free cash flow	FCF	$\frac{\text{operational cash flow net of divid., inv. and loans rep.}}{\text{total assets}}$
Inventories	INVENT	$\frac{\text{book value of total inventories}}{\text{total assets}}$
Bankruptcy predictor	BANCRU	$\frac{1}{ZPROB}=\frac{\text{total assets}}{3.3\times EBIT+\text{sales}+1.4\times\text{ret. earn.}+1.2\times\text{work. cap.}}$
Proxy for firms' size	SALE	$\frac{\text{natural logarithm of sales}}{\text{total assets}}$
Employees number	EMPL	number of employes
Firm's life	AGE	t-years of incorporation
North-west	NW	dummy for firms located in north-western area
North-east	NE	dummy for firms located in north-eastern area
Centre	CENTRE	dummy for firms located in central area

In regard to the Dit and Visco models, we added a variable (CF) to quantify the amount of DIT fiscal allowance carried forward. The existence of a positive amount of DIT carryforward implies that firms are entitled to the DIT incentive even without increasing the total shareholders funds. For this reason, the relationship between CF and the probability to use debt should be positive.

According to the substitution effect pointed out by DeAngelo and Masulis (1980), we should obviously expect all non debt tax shields to have a negative impact on the probability of firms to choose debt financing. In order, however, to also control and to test for the tax exhaustion hypothesis that substitution effects is stronger among firms near to the tax exhaustion, we followed MacKie-Mason's (1990) procedure and introduced a regressor which multiplies investment tax credits (both TITC and VITC) by a variable indicating how firms are closed to tax exhaustion. The variable is in fact the same used by MacKie-Mason and subsequent works (e.g. Graham 1996a), represented by the inverse of Altman's (1968) $ZPROB$ to measure financial condition[22].

4.2.2 Other variables affecting corporate financial decisions

In addition to the tax aspects, there are many other variables which may influence capital structure. Here we shortly describe some of these factors and how we have considered them in our regressions (for recent more thorough discussions see, e.g., Shyam-Sunder and Myers 1999, and de Miguel and Pindado 2001). (Table 2 provides some summary statistics of the variables used in the three regressions).

The theory of capital structure strongly emphasizes the role played by the agency costs generated by asymmetric information. To deal with the asymmetric information problem, we entered in the model the following variables (see also Table 1): an indicator of free cash flow (FCF), the fraction of total assets in tangible (TFA) and intangible (ITA) assets and an indicator of internal resources ($EBIT$).

As pointed out by Jensen (1986), when a firm contracts debt it is committed to interest payments. This commitment reduces the amount of "free" cash available to managers to carry out investment projects in their own interest. This decrease in the managers' discretionary use of the firms' resources alleviates the agency cost and thus rises the firm incentive to use debt.

Moral hazard may arise after debt has been issued because firms have an incentive to carry out risky investments as they can shift the risk of failure on creditors (Jensen and Meckling, 1976). The magnitude of the agency costs depends on the type of assets owned by the firm. The presence of a high percentage of assets-in-place, such as plant and equipment, reduces the agency cost associated with debt issuing for three reasons: tangible fixed assets can be used as collateral in the debt contract in case of bankruptcy (Titman and Wessels, 1988); the firm value depends more strongly on investment already committed (MacKie-Mason 1990); and the disposal of tangible fixed assets is relatively easy to be monitored by creditors (Shum 1996). For these reasons, we expect firms with a large fraction of tangible fixed assets to exhibit a high propensity to use debt. On the contrary, debt should be more expensive for firms with a large fraction of intangible

ΔK represents the increase in the firm's equity capital from 1997 to 1998.

[22] The index 1/ZPROB also entered the regression as a stand-alone variable, to control for the effect on corporate financial decision of bankruptcy risk (see below and the variable BANCRU in Table 1).

Table 2: Summary statistics of explanatory variables

	1995 - "Tremonti tax credit"		1998 - "Dit reform"		1999 - "Visco tax credit"	
	Nr. of obs.	mean	Nr. of obs.	mean	Nr. of obs.	mean
Sample size	1213		25391		22839	
TITC	528	0.006926				
DITS			17323	0.0003792	17920	0.000683
VITC					8835	0.002376
TLC	273	0.310474	2804	0.099757	995	0.100645
DEPR	1203	0.043812	25229	0.044438	22683	0.043804
TFA	1204	0.210149	25345	0.216287	22792	0.215288
IFA	1089	0.021716	22786	0.021378	20146	0.021352
EBIT	1000	0.079573	23038	0.079709	20907	0.086347
INVENT	1182	0.205097	25089	0.199133	22602	0.200191
BANCRU	1213	5.542366	25391	0.636586	22839	0.472798
NW	533		10878		9899	
NE	319		7958		7243	
CENTRE	208		4186		3711	
SOUTH						
AGE	1206	18.806	25213	17.699	22839	18.62
EMPL	1194	193.612	25328	72.689	22815	73.157
SALES	1207	9.567827	25369	9.330894	22824	8.703274

fixed assets and thus their incentive to use debt should be lower. The estimated model incorporates also the ratio of inventory to total assets ($INVENT$) because of its collateral value that reduces debt agency cost.

The pecking order theory affirms that companies prefer retained earnings financing to avoid the agency cost connected to debt (Myers and Majluf 1984). Companies with a large value of $EBIT$, which is a measure of the true productivity of the firm's assets (see Table 1), are supposed to have a higher capacity to generate internal financing resource. Thus, we expect a negative relationship between $EBIT$ and debt.

MacKie-Mason (1990) suggests that firms close to bankruptcy should be reluctant to issue new debt because the interest commitment increases the probability of distress. We use as predictor of bankruptcy a variant of the one proposed by Altman (1968). The index, $BANCRU$, is defined on the basis of a set of variables indicators of the firm financial status (see Table 1). The sign of this variable is expected to be negative because if a firm is characterized by a high bankruptcy risk, it would be less prone to finance its investment with financial debt.

Starting with Rajan and Zingales (1995), a recent literature has focussed on the importance which institutional differences among geographical areas may have on firms specific characteristics that determine capital structure. To control for the deep differences in the financial development among Italian regions (see, e.g. Faini et al. 1993, and Peri 2002), we entered a set of dummy variables (NW, NE and $CENTRE$) to distinguish the geographical location of firms.

We entered also a variable (AGE) indicating the age of the firms. Indeed, the evidence

shows that the incidence of failure is much higher in a firm's earlier years. Besides, old firms may suffer lower information cost associated with borrowing. For this reason, we expect that young firms choose debt less frequently than older ones.

Finally, we approximate by the number of employees ($EMPL$) and by the natural logarithm of sales ($SALES$) the firm's size in order to investigate any size effect on the debt-equity choice.

5 Results

The logit binary choice models have been estimated by the method of maximum likelihood. Table 3 shows the estimated coefficients from the three models, namely the 1995 ("Tremonti"), 1998 ("Dit") and 1999 ("Visco") models. For each case, the Table reports two different estimated equations: the first (model 1) includes all the factors that may influence a firm's financing decision as they have been described in the previous section, while the second (model 2) enters the 'correctly' specified model, which we have selected following a standard 'general to specific' strategy. A positive sign of the coefficients in the Table indicates that the corresponding variable affects positively the probability to choose debt, while a negative sign implies that the related variable influences positively the probability to choose equity.

On the whole, the parameter estimates of the included variables have the expected signs and they are statistically significant in most cases[23]. Obviously, the main variables we are interested to consider are the tax variables, with specific attention to test if the three fiscal reforms carried out in the last decade indeed acted as non debt tax shields and thus reduced the firm incentive to use debt.

Our results strongly support the hypothesis that tax variables influence corporate financing decisions: with the exception of depreciation allowances $DEPR$ in 1995, in both the restricted and unrestricted models, all the other tax variables (including $DEPR$ in 1998 and 1999, tax losses carryforward TLC in the three years, both investments tax credits $TITC$ and $VITC$ in 1995 and 1998 respectively, and the Dit tax allowance $DITS$ in 1998 and 1999) are statistically significant and with the expected negative sign. Conversely, our estimates don't support the tax exhaustion hypothesis: in both the 1995 and 1999 regressions, making $TITC$ and $VITC$ to interact with the variable $ZPROB$ to measure how firms are closed to tax exhaustion, didn't produce any significant effect[24]. As anticipated, we interpret this result as following from the characteristics of the tax shields introduced with the two reforms, which were transitory and large in size.

Worthwhile noticing is also the effect of CF, the variable that measures the amount of the DIT incentive that is not exploited in the current year and that is thus used to reduce taxable income in the following year. The estimation of the 1998 DIT model[25] shows that it is statistically significant and that it reduces the probability that a firm will choose equity. Indeed, as before mentioned, the presence of a positive amount of CF implies

[23] However, for the 1995 (Tremonti) model only a limited number of variables results statistically significant compared to the other models. This is possibly due to the smaller size of the 1995 sample.

[24] To further test the tax exhaustion hypothesis, we also interacted the investment tax credits TITC and VITC with a dummy variable set equal to 1 for firms with negative pre-tax income in the two preceding years. But also in such a case we didn't find support for the hypothesis.

[25] In the Visco model the coefficient has the same sign, but it is significant at only the 0.333 level.

Table 3: Logit estimation

	1995 - "Tremonti tax credit"		1998 - "Dit reform"		1999 - "Visco tax credit"	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
TITC/VITC	-64.5125*	-53.9657***			-33.1058***	-34.2199***
	(33.3034)	(10.8087)			(8.4736)	(7.1535)
DITS			-523.8343***	-530.7682***	-189.7159***	-202.2654***
			(36.3712)	(36.1530)	(19.6067)	(19.0489)
ITC*(1/ZPROB)	34.8905				-2.2414	
	(75.5350)				(9.9840)	
CF			0.2613***	0.2595***	0.0605	
			(0.0490)	(0.0489)	(0.0547)	
TLC	-2.5724**	-2.5892***	-4.0785***	-4.0633***	-0.9991*	-0.9333*
	(0.9646)	(0.7962)	(0.3141)	(0.3061)	(0.5366)	(0.5344)
DEPR	-0.9469		-2.6783***	-2.6753***	-3.2177***	-2.1421***
	(2.5241)		(0.5193)	(0.5111)	(0.5526)	(0.5476)
FCF	-0.1902		-0.1079		-0.0967	-0.1409**
	(0.5264)		(0.0704)		(0.0653)	(0.0643)
TFA	0.8788	0.8146*	1.5659***	1.5284***	1.6828***	1.6023***
	(0.5568)	(0.4802)	(0.1066)	(0.1050)	(0.1136)	(0.1127)
IFA	3.9609		1.8938***	1.9088***	2.4092***	2.2526***
	(2.7288)		(0.4157)	(0.4153)	(0.4388)	(0.4397)
EBIT	-4.4190***	-4.3099***	-5.4077***	-5.4110***	-5.8766***	-5.9882***
	(1.0124)	(0.9229)	(0.2283)	(0.2265)	(0.2344)	(0.2271)
INVENT	2.0625***	2.0031***	1.7606***	1.7460***	1.5973***	1.6115***
	(0.6473)	(0.6235)	(0.1128)	(0.1125)	(0.1156)	(0.1152)
BANCRU	0.0041		0.0008		-0.1049***	-0.1028***
	(0.0033)		(0.0034)		(0.0265)	(0.0256)
NW	-0.0724		0.1015*		0.0470	
	(0.2684)		(0.0529)		(0.0566)	
NE	-0.2216		0.0385		-0.0162	
	(0.2802)		(0.0538)		(0.0577)	
CENTRE	0.0246		0.0863		-0.0083	
	(0.3082)		(0.0587)		(0.0626)	
AGE	-0.0001		0.0054***	0.0056***	0.0039**	0.0044***
	(0.0060)		(0.0012)	(0.0012)	(0.0012)	(0.0012)
EMPL	0.0000		-0.0005***	-0.0005***	-0.0005***	-0.0005***
	(0.0000)		(0.0001)	(0.0001)	(0.0001)	(0.0001)
SALES	0.4122***	0.3127***	0.7692***	0.7706***	0.7813***	0.7773***
	(0.0863)	(0.0641)	(0.0183)	(0.0182)	(0.0190)	(0.0189)
Constant	-2.6462**	-1.6993***	-6.7703***	-6.7010***	-6.2619***	-6.3071***
	(0.8601)	(0.6316)	(0.1745)	(0.1691)	(0.1738)	(0.1650)
Nr. of obs.	1117	1132	25328	25328	22815	22815
Log likelihood	-522.8107	-536.0265	-14488.251	-14492.293	-13306.201	-13318.418
Pseudo R^2	0.0964	0.0954	0.1320	0.1318	0.1340	0.1332

***: significant at 1% level; **: significant at 5% level; *: significant at 10% level

Table 4: Predicted and simulated probabilities from the logit models

	1995 - "Tremonti tax credit"	1998 - "Dit reform"	1999 - "Visco tax credit"
Predicted probabilities	0.7806	0.6299	0.5989
Simulated probabilities			
TITC	0.8104		
DITS		0.6578	0.6202
VITC			0.6052
CF		0.6243	
TLC	0.7926	0.6367	0.5994
DEPR		0.6528	0.6175
FCF			0.5993
TFA	0.7534	0.5631	0.5278
IFA		0.6227	0.5903
EBIT	0.8150	0.7026	0.6900
INVENT	0.7160	0.5607	0.5331
BANCRU			0.6082
AGE		0.6111	0.5830
EMPL		0.6333	0.6029

that the firm is entitled to the DIT incentive even without increasing its total shareholder funds. In this case the equity choice should thus be less likely, as our evidence points out.

Focussing more specifically on the substitution effects, particularly impressive is the magnitude of the estimated coefficients for the three fiscal reforms carried out in the 1990s. Given, however, that the logit coefficients cannot be directly interpreted in terms of partial derivatives of the effect of the regressors on the probability of issuing new debt, we have conducted simulations exercises to determine the relative impacts that the various shields may have generated on the firms' probability of choosing debt. In particular, after having performed the coefficients estimation, we predicted the probability to choose debt and averaged it across the sample[26]. Next, we set to zero the value of one variable at a time, holding other variables at their sample value, and simulate the same probability. Again, we averaged this simulated probability across the sample. The difference in those two averaged probabilities, shown for each regressor in Table 4, is the difference due to the corresponding factor. In other words, the difference between the predicted probability and the simulated probabilities in the table measures the change in the probability to choose debt due to the corresponding explanatory variable.

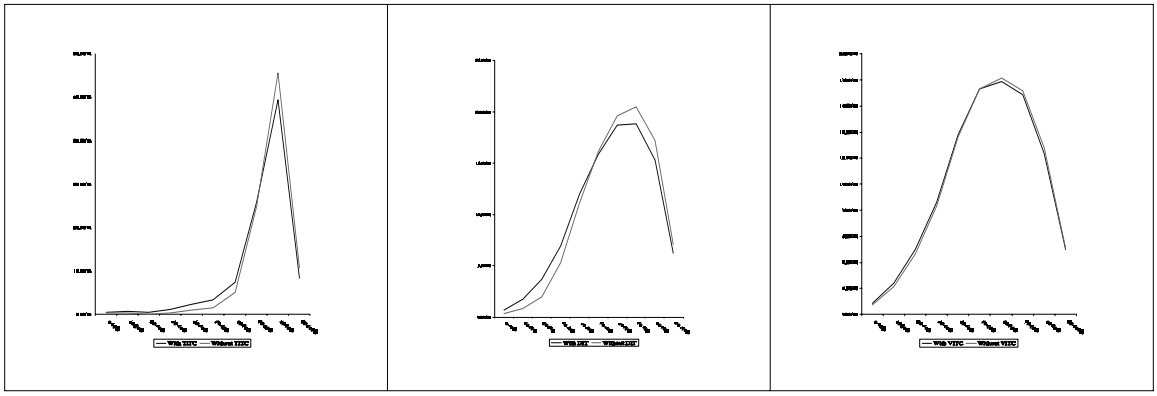
Table 4 reveals the contribution of the Dit to reduce firms' probability to use debt is, among the non debt tax shields, the most substantial: from 65.78% to 62.99% in 1998 and from 62.02% to 59.89% in 1999. Also relevant is the effect of the "Tremonti" tax credit: from 81.04% to 78.06%; a bit less important is that of the "Visco" tax credit: namely, from 60.52% to 59.89%.

Additional information about the effect of these three non debt tax shields may be drawn from the graphs shown in Figure 2. They depict, for each shield, the distribution of the predicted probability to choose debt joint with the distribution of the simulated

[26] The coefficients used for the prediction are the ones based on the restricted models.

probability to choose debt when the amount of the tax allowance is set equal to zero. They diagrams show that, in each case, the probability to choose debt with low probability is bigger when the $NDTS$ works, while the probability to choose debt with high probability is larger when the fiscal incentive does not operate.

Figure 2: Distribution of predicted probabilities of choosing debt financing with and without fiscal incentives



With regard to the other controls included in the regressions, the estimated coefficients are on the whole consistent with the theoretical expectations described in section 4.2.2. Most of the empirical evidence obtained supports the prediction that firms with lower moral hazard costs of debt are more favorable to issue it. The results show that a high fraction of tangible fixed assets TFA causes an increase in the probability to finance with debt (see Table 3). The effect appears particularly strong in the 1998 and 1999 models, where the probability to finance with debt decreases by roughly 10 percent when TFA is set to zero (see Table 4). A similar effect is produced by the fraction of inventory over total assets $INVENT$. Its coefficient is strongly significant in all three models and when the variable is set to zero the probability to choose debt decreases by about 10 percent.

The estimated coefficient on free cash flow FCF has the right sign in the three models, but only in 1999 it is statistically significant. However, even in this latter model the effect of the free cash flow variable is negligible, as it determines a reduction in the probability to choose debt of only 0.04 percentage points.

The $EBIT$ variable has a large significant effect with the predicted sign. The effect is particularly strong in the 1999 model, for which the estimate implies that the probability to issue debt grows by 15% when $EBIT$ is set equal to zero.

Contrary to expectations, a higher fraction of intangible fixed assets IFA renders the debt choice more likely, even though the probability grows only by a small amount. The same result is obtained in MacKie-Mason (1990).

The variable that measures the closeness of firms to financial distress, $BANCRU$, is not statistically significant in 1995 and 1998; however, the parameter estimation is significant at the 1% level in the "Visco" model and the estimated coefficient is negative as expected. This result is indeed in line with the hypothesis that when a firm is characterized by a high bankruptcy risk, it is less prone to finance with debt.

Despite the huge geographical differences in the Italian economic environment, the dummy variables for the geographical location of firms are not significant. (Only in the unrestricted Dit model the North-West NW coefficient happens to be significant at the 10% level). One explanation could be that various opposing effects are at work, which our intercept dummies are too crude to capture. For example, on the one side, one might expect that the lowest financial development in some regions (particularly in the South of Italy) increases the cost of debt financing, making firms more willing to finance with equity; on other side, however, one may object that the smaller size of the same firms, perhaps due to the very same same lowest local financial development [27], makes more difficult for them to access stock capital markets.

The 1998 and 1999 models provide evidence on the positive effect of the age of firms on the likelihood to issue debt. In fact, older firms are less likely to bankrupt and they are expected to suffer lower agency debt cost. Nonetheless, the decrease in the probability to choose debt when the age of firms is set to zero is negligible (roughly, 1.5 percentage points).

The evidence on the size effect is mixed: the sign of the variable that measures the number of employees is negative implying that bigger firms are less likely to choose debt, even if the magnitude of its effect is quite small. On the contrary, when the firm size is approximated by the logarithm of sales the sign turns positive.

6 Summary and concluding remarks

We summarize the sense of the paper, our main findings, and their relationship with the literature, in the following points.

1) Since DeAngelo and Masulis (1980) introduced the concept of non debt tax shield substitutes for interest deduction in lowering the effective marginal tax rate for firms, a large theoretical and empirical literature has mounted to clarify and test the circumstances under which corporate taxation may in fact modify and possibly reduce the incentive for firms to use debt. Standard non debt tax shields considered by DeAngelo and Masulis (1980) included depreciation deduction, tax loss carryforward and investment tax credits. In addition, starting from the early 1990s, several countries have carried out fiscal reforms introducing systems of dual income taxation, which allowed different forms of deductibility of imputed costs of equity capital, to explicitly compensate for the otherwise preferential tax treatment of the services of debt.

2) As emphasized by various authors, the empirical literature have had great difficulty in discerning the conditions under which tax systems are more likely to actually influence firms' financing strategy; and very little is known about the relative magnitude of the impacts of the different non debt tax shields. Furthermore, while there are studies simulating for the different countries the potential advantage for firms of the various dual tax systems introduced, very little empirical evidence has been provided in regard to their actual effects.

3) In this paper we have exploited three episodes of reforms which occurred in Italy in

[27] The result that local financial development promotes growth of firms and industries has for example been obtained in a cross-country study by Rajan and Zingales (1998) — and it has been confirmed across Italian regions in a recent analysis by Guiso et al. (2001).

the 1990s to address some of the issues arisen in the above literature. Our results provide evidence that taxes do indeed matter in corporate financial decisions. In particular, we have found that all the non debt tax shields considered by the above quoted literature, which were operating in Italy in different combinations at the times of our regressions, worked as substitutes for interest deductions.

4) In comparing our results with prior evidence, especially worthwhile noticing is the substitution effect we have confirmed for a classical form of investment tax credit: the 1995 "Tremonti" investment tax credit. Previous tests conducted mainly for the US were controversial on such issue, most studies supporting an intuition firstly advanced by MacKie-Mason's (1990). He suggested that investment tax credits may act as substitutes only for those firms which are close to the tax exhaustion, because only for those firms there is a substantial probability that they crowd the deductibility of interest payments. We explain the difference in the findings with the fact that the investment tax credit considered in the Italian episode was temporary (allowed for one year only) and quite sizeable (following the objective of giving a stimulus to the economy). As a result, most firms might have found themselves in the condition that, in order for benefiting of the credit, they had to forgo interest deductibility. We would emphasize that this interpretation, while in contrast with the tax exhaustion hypothesis, is nevertheless consistent with the more general lesson of MacKie-Mason (1990), that in order to properly consider the relationship between tax shields and the incentive to use debt, one should not to forget the economic and fiscal context in which the former are thought to exert their effects.

5) A different perspective in which the evidence on the "Tremonti" investment tax credit can be considered is in comparison with the "Visco" investment tax credit, which was also introduced as a temporary measure in 1999, but was limited to equity financed investments. We don't find a significant difference in the effects of the two investment tax credits (in fact, if anything, we find a stronger substitution effect for the "Tremonti" investment tax credit): if a lesson can be learned from this comparison, that is that when one considers temporary measures based on investment tax credits for the objective of reducing firms' propensity to debt (as it was one of the explicit aim of the 1999 intervention), then it doesn't make any difference whether the credit is formally restricted to equity financing or not.

6) Perhaps as expected, an even stronger substitution effect we have found in regard to the experience of dual income taxation which was introduced in Italy in 1998. In judging the reported estimates, one should also not forget that while both investment tax credits analyzed were temporary measures, a characteristic which (as just emphasized) might have enhanced their potential substitution effect, the Italian Dit system was designed as a structural intervention, with the special feature that the benefits from equity financing had to accrue as the ordinary return was applied to an increasing share of new equity capital. In the light of this evidence, we believe that if the objective of increasing the thin capitalization of Italian firms remains a target for the political economy, the decision to abandon the Dit system might be reconsidered.

7) Our estimations also show that most of the non tax factors which the literature has emphasized to possibly affect corporate financial decision, were indeed at work in Italy at the times of our investigations. Among the others, mostly important seems to be the effect of agency costs, in particular as reasoned by the so called pecking order theory. On the other hand, we have been unable to identify cross-regional differences in the capital

structure across Italian firms. Perhaps, we need to better interact regional dummies with more appropriate indicators of institutional and financial development.

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