

Taxation and corporate capital structure: an empirical analysis¹

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Abstract

The purpose of this paper is to assess the impact of the 1989 Portuguese tax reform on the capital structure of manufacturing industry corporations. In particular, I analyse the influence of rules governing tax rates and defining taxable income and tax benefits on the financial choices of corporations. In addition, we will also test the impact of the tax system in corporate financing choices in the period 1984-1988, given the significant changes then observed in debt and equity income taxation. A comparative analysis of equity and debt income taxation between 1984 and 1989 is presented, and I derive empirical testable propositions concerning the influence of tax changes on corporate capital structure.

The empirical analysis produced the following conclusions:

i) In 1986 and 1987 Portuguese corporations changed their capital structure by increasing the weight of equity capital. This was particularly notorious on listed companies. In these two years, the government set up a large number of tax incentives to promote equity capital and to encourage the quotation on the stock exchange. We can thus conclude that the changes in tax system produced the intended results. This result is also in line with most empirical studies that conclude that corporate financial choices are affected by significant changes in the taxation of debt and equity income.

ii) The tax reform, as such, has changed only minor aspects of debt and equity income. Accordingly, from 1988 to 1989 corporate capital structures were stable.

iii) There is no statistical relation between tax losses and corporate use of debt. Thus, other non debt tax shields do not appear to have a significant impact on corporate indebtedness.

1. Introduction

The purpose of this paper is to assess what influence the Tax Reform Act of 1989 (TRA 89) has had on the capital structure of Portuguese corporations. It is thus intended to assess to what extent taxes on income from equity and debt - in particular the personal income tax (IRS) and corporate income tax (IRC) - which were created by the aforementioned reform favoured debt or equity financing when compared to the previous system of taxation. In addition, I will also test the impact of the tax system in corporate financing choices in the period 1984-1988, given the significant changes then observed in debt and equity income taxation.

The influence of taxation on corporate capital structure is one of the most debated themes in financial literature, although empirical studies on the Portuguese reality are scarce. The study of debt and equity income taxation in the context of a changing fiscal system is a privileged way to test if corporate capital structure is affected by tax factors.

The Portuguese system of direct taxation of income in force in the 80's had been created in the 60's and was made up of a set of proportionate taxes, imposed separately on each schedule of the tax-payer's income, together with an overlapping tax - 'the complementary tax' - which would fall upon the total of income.

At the beginning of the 80's, this tax system was already showing signs of exhaustion, for several reasons. Firstly, awareness of the degradation of the fiscal system - mainly on equity grounds - and a

¹ This paper was presented in a seminar at the Finance Department of the College of Business Administration, University of Cincinnati, and is based on the author's doctoral dissertation.

general consensus concerning its crisis. Secondly, European integration, in 1986, brought the need to adapt the fiscal system in accordance with international trends, mainly those from OCDE countries. Finally, the fiscal system of the early 80's did not conform to constitutional principles. The Constitution of the Portuguese Republic, articles 106th. and 107th., establishes the principles and structure of the fiscal system. The structure of income tax should be formed by a single and progressive tax on personal income and also by a tax on corporate income. The mixed system of schedular taxes and complementary tax in force at the time did not conform to constitutional regulation.

The new tax regime set up by the TRA89 did not significantly affect the fiscal framework of income from equity and debt, as far as the influence of variables such as tax on corporate profits and tax benefits are concerned. However, it changed the personal taxation of debt and equity income. If we analyse the evolution of the variables which influence taxation on income from equity and debt from 1988 to 1989 it can be concluded that there was a reduction of the tax burden on income from shares and bonds. The reform did not significantly change the relative fiscal attraction of both means of finance. I tried to broaden the period of analysis, and found that the main changes in the taxation framework on income from shares and bonds took place within the regime in force before the reform, especially through the creation of several tax benefits, with a view to increasing corporate use of equity.

Results from analysis of the period of 1984-1988 show that the deliberate fiscal policy of favouring equity may have induced an increase in the importance of this form of financing in the capital structure of Portuguese companies. This incentive was mainly given through the concession of tax benefits, combined with a decrease of taxation on corporate profits. The tax benefits were particularly notorious in 1986, with most of them targeted to corporations listed on the stock exchange or those which had requested listing.

The issue discussed in this paper is relevant for corporate financial policy. A theoretical analysis may provide some important reflections of fiscal policy options towards the incentive for the use of equity and debt by companies. This research field has been highlighted by company financial managers as a priority area of research. Herbert & Wallace (1996) investigated the priorities of CFOs from a set of 144 UK companies, and concluded that the influence of taxation on financial decisions was the most important issue for the companies².

The paper is organised as follows: section 2 reviews the literature on the relationship between taxation and corporate capital structure; section 3 presents the main aspects of taxation on income from shares and bonds before the TRA 89; in section 4 the new fiscal framework of income from shares and bonds, resulting from the 1989 reform, is presented; in section 5 the results of an empirical analysis are discussed; section 6 concludes.

2. Taxation and corporate capital structure: an overview

2.1 The theoretical developments

² The authors also state that: "The findings of the study are broadly similar to those reported by Ramirez *et al* (1991) in respect of the US".

There are three main decisions which are traditionally ascribed to the financial function of a company: the choice of investments, the financing mix and the proportion of profits to be paid out as dividends³. Although investment decisions are those which have the most far reaching consequences in terms of corporate value, financial policy can also be influential. Financial policy can affect value, provided that it contributes towards a maximisation of present value of cash flows received by the investors - shareholders and bondholders. To make this possible it is necessary that financial policy be able to achieve something for investors which they are unable to do themselves, that is, to increase investor's wealth in ways which are not available to individuals.

Among financial decisions which may affect company value is the choice of capital structure. Financial managers attempt to minimise the cost of capital which is influenced by several factors, some of the most important being taxation, bankruptcy costs or agency costs.

Modigliani & Miller's (1958) proposition - stating the irrelevancy of corporate capital structure to corporate value - is the first scientific approach to the question. According to their model the market value of a company would be determined only by the present value of expected cash flows from investments, financial policy having no influence on that value. This conclusion is based upon a set of restrictive hypotheses: a perfect capital market, absence of taxation and bankruptcy costs, and an equal access credit market.

The same authors (Modigliani & Miller, 1963) corrected the initial model, allowing for the possibility of taxation on corporate income. In contrast to what happens with dividends,⁴ under certain circumstances⁵, interest deduction in the computation of corporate taxable income favours indebtedness. The logical conclusion of this new model would be the maximisation of debt, as any other "imperfections" are still ignored.

However, corporations do not follow this policy. Farrar & Selwyn (1967) developed a model in which, apart from taxation on corporate income, taxation of investors' income is also included. As we shall see below, for some investors - those less heavily taxed - corporate debt is still preferable, whereas for those more heavily taxed personal debt is more advantageous.

In considering joint corporate and investor taxation - although still ignoring taxation on shareholder's income - Miller (1977) defended again the irrelevance of corporate capital structure as a valuation factor. He concludes that whatever the capital structure of a company may be there will always be investors whose tax preferences will lead them to look for shares or bonds issued by that company.

This model depends upon some hypotheses which are not always realistic. Apart from the exclusion of taxation on share income, it assumes that companies generate profits before interest and taxes (EBIT), which may allow for the deduction of total interest.

DeAngelo & Masulis (1980) investigated the existence of an optimal capital structure if this last assumption of Miller's model does not hold. The existence of what they called "non debt tax shields" - depreciation or investment tax credits - could lead to an effective rate of taxation less than the statutory one. Thus, the supposed tax advantage granted by debt would be decreased. The existence of non-debt tax shields generates a substitution effect between indebtedness and those tax shields.

DeAngelo & Masulis model consider the investment policy to be exogenous. Damon & Senbet (1988) analysed the effects on financing of the possibility of investment policy being endogenous, and

³ See Damodaran (1998) and Brealey and Myers (1995).

⁴ M&M admitted a fiscal system of the classical type; i.e., the non existence of any reducing or eliminatory mechanism of the phenomenon usually known as "double taxation" of dividends.

⁵ It is supposed that corporations have enough taxable income to allow full interest deductibility.

questioned the main findings from the DeAngelo and Masulis model. According to Damon & Senbet, if we consider investment policy as endogenous it would be impossible to conclude that the increase in fiscal deductions not related to debt creates a reduction in the optimum level of debt. The effect of this increase in tax deductions on debt depends upon two effects which act in opposing ways: the substitution effect and the income effect.

The substitution effect is identical to that which has been described by DeAngelo & Masulis: an increase in non debt tax deductions originates, *ceteris paribus*, a reduction in optimum debt level. The income effect acts differently. Assuming that investment causes an increase in taxable income, as income increases the deduction of financial charges becomes more valuable to the reduction of the tax bill. Thus, an increase in investment related fiscal deductions (depreciation and/or tax credit) will result in an increase (decrease) of the optimum level of debt if the substitution effect is lesser (greater), than the income effect.

Given the theoretical debate on the influence of taxation on corporate financial policy the issue can be illuminated through empirical tests. These tests allow us to assess whether or not the reaction of corporations and investors would conform to the hypothesis according to which taxation influences corporate capital structure. It is obviously difficult to test the conclusions of these models given their underlying hypothesis. Even so, it is worthwhile trying to find a predominant sense in the conclusions of empirical research and whether or not it points towards the relevance of taxation as a determining factor in the choice of a corporate capital structure.

2.2 Results from empirical studies

Empirical studies on the influence of taxation on corporate finance can be grouped into three main types. Firstly, those studies which use data related to the evolution of corporate capital structure in a given period and seek to identify the explanatory factors of that structure through the use of statistical regression techniques⁶. On the one hand, the recourse to data pertaining to sufficiently long periods allows for the elimination of fortuitous causes. This methodology has, on the other hand, the inconvenience of not allowing for the isolation of taxation influence on the choice of corporate capital structure. The theoretical models which constitute the basis of the main proposals about the effects of taxation on corporate finance usually imply a *ceteris paribus* condition; consequently, the results of this empirical approach can hardly be used to validate or reject such proposals.

The second type of empirical studies attempts to confirm whether the hypothesis related to taxation effects on company value are confirmed by share and bond price changes following variations in corporate capital structure⁷. The main difficulty inherent to this approach lies in the possibility of the price changes being attributed to other causes which may have identical consequences.

Finally, one other type of research seeks to test whether, at certain moments, in which important changes in the taxation system occur - particularly in the context of tax reforms - there is any relationship between changes in the tax treatment of debt and equity income and corporate capital structure. This is an approach which has been gaining ground⁸ and which we will apply in the study of the Portuguese case.

⁶ See Bradley, Jarrell and KIM (1984) and Titman and Wessels (1988).

⁷ See Masulis (1980,1983)

⁸ See Mackie-Mason (1990), Gordon and Mackie-Mason (1990), Givoly, Ofer and Sarig (1992), Trezevant (1992), Saá-Requejo (1996), Schulman, Thomas, Sellers and Kennedy (1996).

3. Debt and equity income taxation in Portugal before the 1989 tax reform

If the theoretical and empirical analysis presented in this paper was restricted to the comparison of the tax treatment of debt and equity income in 1988 and 1989, one could certainly analyse the effects of the reform on corporate capital structure with less contamination from other spurious factors. However, we would then miss the opportunity to find out whether, in a broader period prior to the TRA, other fiscal changes affected corporate financial policy. This concern is even more justified if we consider that, especially in 1986, several corporate tax incentives were created which may have had some impact on capital structure.

The importance of this analysis, and of the chosen period, is related to two essential factors. Firstly, it is obviously necessary as a comparison to the fiscal framework of the same types of income after the TRA 89. Secondly, the study of the evolution of taxation over a five year period allows for the detection of eventual major changes prior to the reform. These changes in debt and equity income taxation may provide precious clues for the empirical analysis.

This section will present the evolution of tax treatment given to income from equity and debt, in Portugal, between 1984 and 1988. The years 1984 and 1985⁹ will be used as a comparison period for changes in the fiscal framework of income from shares and bonds, which took place from 1986 onwards.

The main trends regarding tax rates, rules of computing of taxable income and tax benefits can be seen in Tables 1 to 4. Table 1 refers to the corporate tax; table 2 to taxation of dividends and interest by the then called “capital tax” - the schedular tax on regular investment income in the personal taxation system; table 3 to taxation on capital gains by the schedular personal tax system; table 4 to taxation by the complementary tax of profits retained by corporations and interest and dividends received by individuals. The latter was an overlapping tax which at individual level was an element of progressiveness, while at corporate level it was aimed at the taxation of retained profits which, unlike dividends, were not subject to “capital tax”.

Table 1
Tax rates, rules for assessment of taxable income and tax benefits in corporate tax (1984-1988)

1- Tax rate¹⁰ (%)

Year	1984	1985	1986	1987	1988
Tax rate	35-45	35-45	32.5-37.5	32.5-37.5	30-35

⁹ Due to limitations of available statistical data it was not possible to go as far back as 1980, as was our original intention.

¹⁰ The lower tax rates applied to profits less than 3M PTE.

2- Taxable income (main changes in depreciation, cost of goods sold and provisions methods of computation)

No significant changes during the period

3- Tax benefits

3.1 Investment tax credit (ITC) - Decree-law 197-C/86

1986 - 10% of the investment made was deductible in the CIT tax bill

1987 - 8% of the investment made was deductible in the CIT tax bill

1988 - 6% of the investment made was deductible in the CIT tax bill

3.2 Double ITC -Decree-law 161/87

1987 - 16% of the investment made was deductible in the CIT tax bill

1988 - 12% of the investment made was deductible in the CIT tax bill

3.3 Reduction of the CI tax

1986 - 50% reduction of the CIT in the following 3 years (for those corporations listed on the stock exchange which made a public stock offer (Decree-law 172/86)

1987 - 40% reduction of the CI T in the following 3 years (for those corporations listed on the stock market which had previously requested their listing in the stock exchange and had made a public offer (Decree-law 130/87)

1988 - 25% reduction of the CIT in the following 3 years (for those corporations listed on the stock market which had previously requested their listing in the stock exchange and had made a public offer (Law 2/88)

3.4 Deduction of dividends from taxable profit

1984 - Deduction of dividends up to 10% of the capital represented by shares issued by corporations listed on the stock market, in the first 5 years post listing (Decree-law 409/82)

1985 - Deduction of dividends up to 10% of the capital represented by shares issued by corporations listed on the stock market, in the first 5 years post listing: valid for the years 1985, 1986, 1987. (Decree-law 182/85)

3.5 Conventional costs of equity

1986 - Conventional equity return considered as a deductible cost in 1986, 1987 and 1988 (Decree-law 182/86)

Table 2

Taxes, rules of determination of taxable income and tax benefits in personal tax (dividend and interest income) (1984-1988)

1-Dividends

1.1 Tax rate (%)

Year	1984	1985	1986	1987	1988
Tax rate	15	12	12	12	12

1.2 Tax benefits

1985 - Tax reduction of 50% for dividends from listed shares
(Decree-law 182/85)

1986 - Tax exemption for dividends from listed shares (Decree-law
172/86)

2-Interest income

2.1 Tax rates (%)

Year	1984	1985	1986	1987	1988
Tax rate	12	12	12	12	12

2.2 Taxable income

1987 - Inclusion of bond amortization premiums and any
bond income in taxable income (Decree-law 121/87)

other type of

2.3 Tax benefits

1987 - Exemption for interest from bonds with 8 year maximum
maturity

- Reduction to 10% of tax on interest from bonds issued in 1987
(Decree-law 121/87)

1988 - 50% reduction of tax on interest from bonds issued in
2/88)

1988 (Law

Table 3
Taxes, taxable income and tax benefits in personal tax (capital gains)(1984-1988)

1-Tax rate (%)

Year	1984	1985	1986	1987	1988
Tax rate	12	12	12	12	12

2- Taxable income computation

No significant changes

3-Tax benefits

1984 - Capital Gains Tax exemption in equity increases by incorporation of reserves or share
issues¹¹, for corporations either listed on the stock market or requesting listing (Decree-law 409/82)

1985 - Capital Gains Tax exemption for equity increases by incorporation of non re-valuation
reserves (Decree-law 115-C/85)

1986 - Capital Gains Tax exemption for all equity increases (Decree-law 172/86)

¹¹ As capital gains from selling of shares were not taxed by Capital Gains Tax, it taxed equity increases when incorporating retained profits into share capital.

1987 - Capital Gains Tax exemption for all equity increases by incorporation of reserves (Decree-law 164/87 and Decree-law 115-C/85)
1988 - Capital Gains Tax exemption for all equity increases by incorporation of reserves (Law-2/88)

Table 4
Taxes and tax benefits in Complementary Tax (1984-1988)

1- Tax rates¹² (%)

1.1 - Distributed profit

A -from non- registered or deposited shareholder shares

Year	1984	1985	1986	1987	1988
Tax rate	24	24	24	24	24

B -from registered or deposited nominal or shareholder shares

Year	1984	1985	1986	1987	1988
Tax rate	4-60	4-50	4-50	4-50	24**

(**) Tax payers could opt out to comprise their income and have it subjected to progressive taxes varying between 4% and 50%.

1.2 - Retained profits

Year	1984	1985	1986	1987	1988
Tax rate	6-12	6-12	6-12	6-12	6-12

1.3 - Interest from bonds

A -from non-registered holder bonds

Year	1984	1985	1986	1987	1988
Tax rate	24	24	24	24	24(**)

B -from registered nominal or holder bonds

Year	1984	1985	1986	1987	1988
Tax rate	4-60	4-50	4-50	4-50	24(**)

2- Tax Benefits

1984 - Deduction of 30% of the amount applied in the acquisition of shares - up to 20% of the total net income (Decree-law 409/82)

¹² In the cases under 1.2, 2 and 3.2 the minimum and maximum complementary tax rates are presented, in relation to married tax payers. This was, as we already noted, a progressive tax

1985 - Only 50% of the dividends from nominal or holder are taxed by complementary tax (Decree-law 182/85)	- Deduction of up to PTE 250.000 from the amount applied in the acquisition of listed shares (Decree-law 182/85)
1986 - Only 50% of the dividends are taxed by the complementary tax (Decree-law 172/86)	- Deduction of up to PTE 100.000 from the amount applied in the acquisition of listed shares (Decree-law 172/86)

From tables 1 to 4 the following trends can be observed:

i) Treatment of profits by the Corporate Income Tax

The evolution of the main features which affected taxation of corporate profits through the period 1984-1988 can be summarized as follows (see table 1):

-As far as the statutory tax rate is concerned, there was a decreasing trend. From 1984 to 1988 tax rates were reduced from 35% to 30% - for profits below 3M PTE - and from 45% to 35% - for profits above that amount. The most significant reduction occurred in 1986, for profits higher than 3M PTE, with the decreasing of the tax rate from 45% to 37.5%.

-As regards taxable income, the stability of its main determinants, namely of methods for the computation of depreciation, provisions¹³ and the cost of goods sold should be noted.

-Among the tax benefits set up during the period, the ITC should be highlighted. Because it was a deduction on the tax bill - of up to 90% - it would have been an appreciated tax saving for companies that implemented capital spending plans.

For benefits of another nature, which we have grouped into three types - tax reduction, deduction of dividends and consideration as a tax deductible cost of a certain equity return¹⁴ - it should be noted that the first two were related to share offerings to public subscription, the former reaching its maximum value for capital increase which took place in 1986, and the latter being extended to any type of corporation.

To sum up, we could say that the evolution of corporate tax norms was favourable to equity income. Added to a lowering of the tax rate there is a wide range of equity favourable related tax benefits, which reached their maximum expression in 1986 and 1987. As we shall see below, the year of 1986 was also particularly notorious for the setting up of other tax benefits, which affected the tax preference of debt and equity.

ii) Treatment of dividends and interest by personal income tax

¹³ For depreciation, the general rule was the straight line method; for provisions for receivables or inventory the tax code allowed a certain annual percentage of balances to be provisioned, provided that the accumulated percentage was not higher than a certain proportion of total receivables and inventory registered in the balance sheet.

¹⁴ This can be seen as a deduction of the opportunity cost of equity employed in financing firms.

The evolution of taxation on income from shares and bonds between 1984-1988 can be characterised by the following main points (see table 2):

-As far as taxes are concerned, a 12% tax equalisation on interest and dividends should be noted in 1985; even though that equalisation was jeopardized again in 1987 with a decrease in the tax on interest income to 10%.

-For tax benefits, Decree-law 172/86 strongly privileged dividends distributed by corporations listed in the stock exchange - although this benefit was suspended in 1987 -; whereas for bonds Decree-law 121/87 exempted interest from bonds issued that year.

In conclusion, it was within the sphere of tax benefits that there was a more concentrated set of incentives which influenced choices of company finance. Towards equity, in particular, it was in 1986 that the most generous tax benefits were concentrated. These were later abolished in 1987 because of the evolution of demand on the stock market¹⁵.

iii) Tax treatment of capital gains

From the evolution of capital gains taxation between 1984 and 1988 the following trends are detectable (see table 3):

-Tax rate was stable;
-There was an abundance of tax incentives for equity increase by incorporation of reserves or new share offerings. Equity increase by incorporation of reserves does not change capital structure. However, the same does not apply to capital increase by share issuance, where the exemption of Capital Gains Tax in 1986 could have been a major factor in the growing importance of equity.

iv) Taxation on income from equity and debt by Complementary Tax

The overlapping tax in the personal taxation area - Complementary Tax - was divided into sections A and B, containing rules on the taxation of individuals and corporations, respectively. For individuals, this tax sought to introduce an element of personalisation into the tax system, given the proportionality of taxes on scheduled personal income¹.

However, the submission to Complementary Tax of corporate income had other objectives, such as the correction of some flaws in the taxation of shareholders².

As far as the distribution of corporate profits and interest from bonds is concerned there is no evidence of relevant changes - see table 4 - with the exception of a decrease in maximum marginal tax from 60%

¹⁵ If in 1984 and 1985 the apathy of investors could justify the concession of tax benefits to induce demand of shares, the opposite was true in late 1986 and in 1987, where an overheated stock market produced a very strong bull followed by an equally strong crash in the autumn of 1987.

¹ It should be noted that capital gains were excluded from the basis of the incidence of Complementary Tax, being only taxed by the - proportional - capital gain tax.

² The Code presented the following reason for taxation of non distributed profit in corporations: non distributed profits were not subject to personal taxes, so this could be used with the objective of tax avoidance.

to 50% in 1985. For retained profits there was no change. In this tax it is also within the range of tax benefits that there was a favourable treatment of equity income, mainly in 1985 and 1986.

The general conclusion to be drawn in this section is that it was essentially tax benefits that affected the fiscal attraction of debt and equity as corporate financing choices. The most favourable set of equity favouring tax benefits occurred in 1986.

Thus, between 1984 and 1988, the tax system was used to deliberately influence the Portuguese corporate capital structure by favouring equity finance. This influence was extensive throughout the entire corporate world, but would have been particularly strong for stock market listed corporations, which faced a significant set of tax benefits to increase the weight of equity in their capital structure.

4. The Tax Reform of 1989 and the taxation of income from equity and debt

The foreword to Decree-law 232/84, of the 12th. of June, which set up the Commission for Tax Reform, clearly defined the motives for the reform:

“The distortions our tax system has been suffering, the maladjustment of its architecture in relation to more adequate models for the social and economic level of the development of the country and its insertion within the European integration movement; its incapacity to satisfy the objectives of equity, efficiency, simplicity and the certainty of a modern fiscal structure which corresponds to the general goals of justice, well-being and progress, make the global restructuring of the Portuguese tax system imperative.

The two basic types which, in the area of direct and indirect taxation will make up the new tax framework have been known for some years- single tax on income and value added tax, respectively - ... it is urgent to resolutely carry out the work of reform in the sphere of direct taxation...”.

The three main motives which caused the reform of direct taxation are evident in this foreword. Firstly, consciousness of the degradation of the tax system then in force established by the reform of the 60's and the general consensus of a crisis in that system. Secondly, the need to adapt the tax system to new circumstances, as a result of European integration, and the necessity for its modernisation in accordance with international trends, mainly those from OCDE countries. Had this modernisation not taken place, the Portuguese fiscal system would have become an example of archaism, which could in turn have caused the flight of investment and qualified human resources to other fiscal jurisdictions. Finally, the fiscal system in force at the beginning of the 80's did not conform to constitutional principles. The Constitution of the Portuguese Republic, in articles 106 and 107, establishes the principles and structure of the tax system. The structure of the system for the taxation of income is formed by a single, individual, progressive income tax, together with corporate income tax. The mixed system of schedular taxes and complementary tax in force was not in accordance with constitutional principles. This necessity for conformance with the constitution became a strong motivating factor in system reform.

The 1989 Reform had the introduction of a single progressive tax on individual income (IRS) as one of its main objectives. Although schedular taxes were abolished, it could not be said that the reform introduced a single, progressive tax in its purest form. For certain categories of income (E- income

from capital application, and G - capital gains) taxation schemes through proportional taxes were instituted. This was a source of considerable controversy between the government and the Commission for Tax Reform and ignited a dispute that ended in the Constitutional Court.

Moreover, a certain moderation of the IRS by establishing a set of rates between 15% and 40% was partially reverted by the tightening of tax brackets, a fact which also generated strong criticism from several tax experts.

As for the taxation of companies, the new tax - IRC - did not differ greatly from the former corporate tax. In relation to the several tax benefits in force in 1988 (some of which were abolished) a transition scheme was set up in which the advantages acquired up to 1988 were guaranteed in the sphere of the new tax regime.

As far as the effects of the reform on taxation of income from equity and debt are concerned, table 5 shows a synthesis of taxation rules for this type of income in 1988 and 1989.

Table 5
Taxation on income from shares and bonds in 1988 and 1989

	1988	1989
1. Taxation on corporation profits		
1.1 CIT (%)	30-35	36.5
1.2 Assessment of taxable income (most important aspects)		
Depreciation and reintegration	Straight line	Straight line/Declining bal.

Cost of goods sold	LIFO/FIFO	LIFO /FIFO
Capital gains	Taxed at 12% reinvested)	Taxed at 36.5% (exempt if
Deductions to taxable profit	Deduction of reinv. profit	Transition regime
1.3 Tax benefits		
Double ITC	in force	Transition regime
ITC	in force	Transition regime
Reduction of CIT	in force	Transition regime
Deduction of dividends from taxable profit	in force	Transition regime
Conventional cost of equity	I n force	Transition regime
1.4 Taxation of retained profits in Complementary Tax (%)		
	6-12	0
2. Taxation of investor's equity income		
2.1 Retained profits		
Capital gains from shares in capital increase	12% (exempt, in capital increases through incorporation of reserves)	10%(exempt, if shares are held longer than 12 months)
Capital gains from share selling		
2.2 Dividends		
Capital tax	12%	
Complementary tax	24% (in certain cases with option of inclusion in taxable income)	25%; option of inclusion with benefit of a tax credit of 20% of the corresponding CIT
IRS (PIT)		
20% (if dividends from listed shares)		
3. Taxation of bond's interest		
Capital tax	6%	
Complementary tax	24% (in certain cases with option of inclusion in taxable income)	
IRS (PIT)		25%

As the table 5 shows, the main modifications brought about by the TRA 1989 in taxation of income from shares and bonds resulted from the change in the tax burden which, at individual level, affected these types of income, and also from the elimination of autonomous taxation of corporate retained profits.

As far as the taxation of corporate profits by the CIT is concerned, the situation was maintained fairly identical to that in force in 1988. If it is true that the progressive reduction of tax benefits could act as a factor of tax burdening of corporate profits, it is also true that the establishment of a declining balance depreciation method partially compensated for this benefit reduction.

The tax burden on income from both forms of finance was diminished. Retained profits, dividends and interest from bonds benefited from a lighter tax burden. In order to illustrate this proposition, let us assume that a corporation presented, in 1988 and 1989, taxable income amounting to R and that the only fiscal variables affecting this income are tax rates. Furthermore, we will consider that the corporation

distributed half of the net profit; the CIT is 35% for all profits, and the complementary tax - section B - applicable to retained profits is 12%. The complementary tax - section A - is of 24%. Finally, we will assume that dividends and interest are taxed in the PIT regime by a liberatory - proportional - tax rate. In 1988 the total tax burden on this type of income - CIT, complementary tax section B, tax on capital and complementary tax section A - was of 49.6%. In 1989 it would have been of 42.8% - in the case of listed shares - or of 44.4%, in the case of non listed shares.³

If the same income before tax had been paid to bondholders, the total tax burden would have been of 28.5% in 1988, and of 20% in 1989.

Given that both means of finance saw their tax burden reduced, it can be argued that the Tax Reform of 1989 did not have far reaching effects in corporate capital structure.

From the conclusions of sections 3 and 4 the hypotheses to be tested are:

H.1 - Between 1984 and 1988, the fiscal system was deliberately used to influence the capital structure of Portuguese corporations. This influence, which had an overall general effect on companies, would have been particularly evident in stock market listed corporations. As for the notorious concentration of tax benefits to equity income, a jump in the relative importance of equity in corporate capital structure we should observed in 1986,;

H.2 - Given the relative stability of taxation, with regard to the rate of taxation on corporate income together with tax benefits, and taking into account the lessening of the tax burden in relation to individual tax (whether on income from shares or bonds), changes in capital structure should not have been significant for most companies as a result of the TRA of 1989. -

I have not yet defined any proposition which establishes a relationship between corporate financing decisions and the particular fiscal situation of companies. In order to broaden the sphere of the empirical analysis of this paper I shall test the relationship between indebtedness and the existence of non-debt tax shields for the year of 1989.

I will not test the hypothesis used by some empirical studies carried out on this subject that followed the DeAngelo and Masulis (1980) conclusion: that companies with a heavier weight of depreciation have less debt in their balance sheets due to the tax saving effects of non debt tax shields¹⁶. This hypothesis suffers from two serious limitations: it neither makes a distinction between financial and investment policy, nor does it separate the tax effect of depreciation from securability effects of fixed assets in debt financing. I will test whether the amount of tax losses carried forward in 1988 is related

³ In fact, in 1988, considering that a corporation obtained an income before tax of 100, it would pay 35 in CIT. From the net result of 65, the distributed part (32.5) would undergo in Capital Tax of 12%, amounting to 3.9. Profit retained would be subjected to the same taxation rate. In turn, shareholders would be taxed, in complementary tax, according to the net value of dividends, and would have to pay 6.8. Thus $(35+3.9+3.9+6.8)=49.6$.

In 1989, in the case of listed shares, CIT would rise up to 36.5 and the application of the liberatory tax to dividends received would include the payment of a personal tax of 6.3. Thus $(36.5+6.3)=42.8$.

If the corporation retained the total of the profits, the tax burden in 1988 and 1989 (without considering taxation of possible capital gains) would be of 42.8% and 36.5%, respectively. If profits were entirely distributed, the tax burden would be of 56.5% in 1988 and 42.3% (non-listed shares) and 49.2% (listed shares).

¹⁶ See Augusto (1996) and Esperança and Gama (1999)

to debt changes in 1989. Corporations presenting a higher tax loss carried forward would have had a higher probability of supporting a lower effective corporate tax rate, reducing debt tax attractiveness. However, the testing of this hypothesis, without taking other variables into account, may lead to results which do not relate the fiscal variable to the changes in debt, but with creditor risk aversion to corporations with high levels of tax loss carried forward.

In order to eliminate this possibility the sample used will be divided into two sub-samples: the first will include those companies in which the existence of losses carried forward co-exist with a solid balance sheet; and the second group shows both losses carried forward and a weak financial condition.

If there is a relationship between indebtedness and losses carried forward as a source of tax savings it should be obvious from the corporations in the first sub-sample. This will be our third testable proposition:

H.3 - Corporations with higher tax losses carried forward in 1988 will show a lower increase in debt between 1988 and 1989.

5. Empirical analysis

5.1 Definition of variables

A - How to measure corporate capital structure?

Statistical work on the study of the corporate capital structure is based on several definitions of this variable⁴. This diversity of measurement can be found in the different types of empirical approach identified in section 2.

In spite of this, amongst the multiple ways to measure corporate capital structure there are some which are characterised by greater consistency. Weston and Copeland (1986) state that:

“Financial structure refers to the way a firm’s assets are financed. Financial structure is represented by the entire right hand side of the balance sheet. It includes short term debts and long-term debts as well as shareholders’ equity. Capital structure or the capitalization of the firm is the permanent financing represented by long-term debt, preferred stock and shareholder’s equity. Thus, a company capital structure is only part of its financial structure”.

The corporate capital structure should thus be related to long term financial means, and represents the result of decisions which seek to provide companies with financial means of a stable or permanent nature. Capital structure indicators which include the total liabilities of a company overestimate the relative weight of debt⁵.

Following this proviso, our preference leans towards a measure relating long term debt with equity.⁶

⁴ See, among others, Givoly *et al* (1992), Rajan and Zingales (1995), and Sweeney, Warga and Winters (1997).

⁵ As stated by Rajan and Zingales (1995): “The broadest definition of stock leverage is the ratio of total liabilities to total assets ... since total liabilities also includes items like accounts payable, which may be needed for transaction purposes rather than financing, it may overstate the amount of leverage”.

⁶ In order to illustrate the consensus which we think exists about this position, we list below some examples of the definition of capital structure contained in some studies carried out on the subject:

-Titman and Wessells (1988) state: “Six measures of financial leverage are used in this study.. They are long

The variable used is defined as: $\frac{LTD}{LTD + E}$ where: LTD represents long term debt and E is equity, both at book values¹⁷.

A final observation about the problems arising from the utilisation of this capital structure variable. During the entire period under analysis (1984-1989), it should be taken into consideration that the accounting rules of Portuguese companies then used for leasing could have had some influence on the results. The payments incurred by lessees were registered entirely as operational costs. The asset and liability structure of companies was not affected by this means of financing which, in its essence, was similar to indebtedness⁷.

B - Tax losses, financial condition and debt change

The third testable hypothesis presented in section 4 is related to the influence of accumulated losses in 1988 on debt changes in 1989. If the tax factor influences financial decision making, companies with no tax losses to carry forward should take on more debt, as they cannot benefit from the future deduction of accumulated tax losses.

In order to isolate securability effects, the sample has to be divided into two sub-samples: firms with solid balance sheets and firms in a weak financial condition. It is thus necessary to define the criteria for selection. In the application of this test, companies with a solid financial situation are those which have cumulatively fulfilled the following requirements in 1988:

- a) equity/net assets >25%;
- b) net working capital >0 ;
- c) profit before taxes for 1988 >0.

5.2. Methodology and samples

5.2.1 Methodology

The methodology used to test the first two hypotheses will be analysis of variance (ANOVA)¹⁸.

term, short term and convertible debt divided by market value of equity”.

-Givoly *et al* (1992) define leverage “...as the ratio of the value of debt to the sum of the value of debt and equity”.

-Rajan and Zingales (1995) consider that capital structure “is probably best represented by the ratio of total debt to capital (defined as total debt plus equity)”

Sweeney *et al* (1997) use the measure *long term debt/total capitalization*, as the denominator represented by total debt and total equity.

¹⁷ We used book values mainly because market values of equity and debt for most firms were not available.

⁷ Only in 1994 were companies obliged to enter leasing as fixed assets and to register responsibilities arising from those contracts as liabilities.

¹⁸ We will apply the randomized block design, using firm dimension - measured by turnover - as a block generating criteria.

We intend to assess the influence of tax changes affecting the fiscal attraction of equity and debt in the capital structure of the manufacturing industry corporations. With the use of block ANOVA we will try to clear the influence of the dimension effect⁸ from the results of the test. In the test of the third hypothesis we will use linear regression (O.L.S.).

The model applied when using ANOVA is:

$$Y_{ij} = \mu + \tau_j + \beta_i + \varepsilon_{ij}; i = 1, \dots, n; j = 1, \dots, k$$

where Y_{ij} - represents the corporate capital structure variable ;

μ - indicates the effect common to all observations;

τ_j - measures the degree of tax influence on corporate capital structure changes;

β_i - represents the blocks, resulting from the application of the “dimension” criterion in the samples used;

ε_{ij} - the residual variable of the model.

The underlying ANOVA model is based on certain hypothesis:

- populations are normally distributed;
- population variances are equal;
- samples are randomly selected.

After the assessment of the consistency of hypothesis - namely the equality of variances for which we will use the Bartlett test⁹ - the described hypothesis were tested for a level of significance of 0.05.

In the analysis of H.3 we will use a model of O.L.S. whose mathematical expression is:

$$y_i = a + \beta x_i + \varepsilon_i \quad i=1, \dots, n$$

where y_i - represents the expected value of debt change between 1988 and 1989;

x_i - represents the independent variable, given by the ratio between losses carried forward in 1988 and profits before taxes for the same year;

ε_i - residual variable of the model;

a, β are the regression parameters.

The underlying hypothesis for this model are:

- i) Variable ε_i follows a normal distribution with zero average and constant variance (σ^2);
- ii) The values of ε_i are independent.

After the assessment of the consistency of hypothesis, namely of homocedasticity and error independence, the statistical values will be tested for a level of significance of 0.05.

5.2.2 Samples used

⁸ The relationship between this variable and capital structure is shown in Rajan and Zingales (1995).

Sampled corporations were divided into three classes: large (if turnover was higher than 3 M PTE ; small (if turnover was less than 0.7 M PTE) ; and medium, for the remainder.

⁹ A description of the test can be seen in Neter *et al* (1985)

Tests were based on two samples, one extracted from the Database of the Portuguese Central Bank (DPCB) and another obtained from the Lisbon Stock Exchange (LSE).

To test the first hypothesis we had to obtain a sample covering the period 1984-1989. At the beginning of the 80's, in Portugal, little concern was given to the systematic collection and treatment of company financial statements into databases which might be used in empirical research¹¹. However, a sample was obtained, characterised below, from corporations¹⁹ of the manufacturing industry which were included in the DPCB between 1984 and 1989. This resulted in a sample of 68 companies¹². The sample pertaining to 1984-1989 extracted from the CBBP contains only 11 listed companies. I then resorted to LSE in order to obtain a new sample of companies belonging to the manufacturing industry, which contains 56 companies.

To test the second hypothesis I used another sample for the period 1987-1989 applying the same selection criteria, which resulted in a sample of 273 companies.

In relation to the second sample a larger number of companies could have been included if the period under consideration had been 1988-1989. Apparently, for the purposes of the comparison of the periods immediately before and after the reform, that would have been reasonable. The reason for the 1987 option is the following: as in 1988 the reform parameters were already known, corporations could have included the predisclosed effects of the taxation changes for that year in their financial decision making. The introduction of 1987, where this knowledge was less evident, seemed to us a reasonable way of lessening its influence on the test results.

5.3 Results

5.3.1 Results from the test to the first hypothesis

A- Analysis of the equality of variance hypothesis

The Bartlett test led to the rejection of equality of variances. However, one of the characteristics of the samples used - equal number of observations in each year - allows us to conclude that the non-verification of variance equality is not a problematic factor, given the robustness results obtained in relation to the hypothesis of the model. According to Neter *et al* (1985): “The *F* test and related analysis are robust against unequal variances when the sample sizes are approximately equal”.¹³

B- Results from the use of the methodology adopted.

The application of block ANOVA originated the following results:

Table 6
Results from the test H.1

¹¹ Two data bases were then organised: by Banco Português do Atlântico and by Portuguese Central Bank.

¹⁹ In Portuguese : “sociedades anónimas”.

¹² The data base of the Portuguese Central Bank was set up in 1982. However, for 1982 and 1983, the number of companies of the manufacturing industry contained in that data base would be insufficient to obtain samples which produced statistically significant results.

¹³ The same authors also state that: “The *F* test for the equality of factor level is but little affected by lack of normality, either in terms of the level of significance or power of the test. Hence, the *F* test is a *robust* test against departures from normality”.

Year	DPCB sample	
	Average debt ratio	Variance
1984	0.358	0.198
1985	0.398	0.262
1986	0.297	0.120
1987	0.248	0.089
1988	0.208	0.061
1989	0.226	0.056

Year	LSE Sample	
	Average debt ratio	Variance
1984	0.251	0.064
1985	0.284	0.076
1986	0.207	0.043
1987	0.101	0.019

	Sample from DPCB <i>F test</i>	Sample from LSE <i>F test</i>
LTD		
LTD + E	2.71 *	6.76 *

* Significant at the level of 0.05

The conclusion to be drawn from these results is that there are statistically significant differences in the capital structure of manufacturing corporations for the period under survey. Debt ratios substantially decrease from 18984 to 1987.

Only by comparing pairs of averages, in order to search for those which differ, will it be possible to conclude in which years greater variations were verified in terms of the relative weight of equity and debt. By observing the evolution of average values capital structure variable - see table 6 - , the years 1986 and 1987 are those in which greater annual changes occurred. These were translated in a decrease in the relative importance of debt, and as increases in equity weight.

In order to complement the analysis, I shall look at the results of tests carried out to determine in which years significantly different averages were registered.

The results are shown in Tables 7 and 8.

Table 7
Tests on pairs of averages, 1984-1989 (DPCB sample)

The verification of annual average differences was done by applying the Fisher test of minimum differences (least significant difference - LSD).

Cells marked with (*) represent pairs of averages in relation to which there were statistically significant differences in the capital structure variable.

	1984	1985	1986	1987	1988	1989
1984			*	*	*	*
1985			*	*	*	*
1986	*	*			*	*
1987	*	*	*			
1988	*	*	*			
1989	*	*	*			

Table 8
Tests on pairs of averages - 1984-1987 (BVL sample)

The verification of annual average differences was made by applying the Fisher test of minimum differences (least significant difference - LSD).

Cells marked with (*) represent pairs of averages in relation to which there were statistically significant differences in the capital structure variable.

	1984	1985	1986	1987
1984			*	*
1985			*	*
1986	*	*		*
1987	*	*	*	

From the test results the following conclusions can be drawn:

i) In 1986 - the year in which generous tax benefits should have increased equity - capital structure changes confirming the increase in importance of this source of finance are observed. The significant increase in equity weight is still evident in 1987, probably for two reasons: the considerable amount of equity favouring tax incentives, and lags in the reaction of companies in taking advantage of incentives set up in 1986.

ii) In the years 1987-1989 there were no significant changes in capital structures. Although this result is subject to confirmation through the second sample (1987-1989), it constitutes a first sign for the validation of H.2.

To sum up, it could be said that 1986 and 1987 were years in which the Portuguese manufacturing industry corporations changed their capital structures as a result of the influence of tax incentives for equity increase, and that listed corporations strongly took advantage of those incentives.

5.3.2 - Results from tests of the second hypothesis

The results obtained are the following:

Table 9
Results from the H.2 test

F test	
LTD	
LTD + E	1.55

The unchanging capital structure hypothesis cannot be rejected, which confirms that in the years 1987-1989 capital structures of the Portuguese manufacturing industry corporations did not undergo significant changes. This result also confirms the suggestion presented in 5.3.1, which was based on a smaller sample.

5.3.3 Results from tests of the third hypothesis

A) Verification of the model hypothesis

Through the application of the Goldfeld-Quandt test we conclude by the acceptance of homocedasticity. The value of the Durbin-Watson test allows us to decide for the acceptance of error independence.

B) Results obtained

The expression in use can be represented by:

$$ADEBT_{89/88} = \alpha + \beta * LOSSES_{88} + \varepsilon$$

The results obtained can be seen in Table 10.

Table 10

Results from the test for H.3

The Goldfeld-Quandt test to check for homoscedasticity produced an F value of 0.708, lower than the critical value of 1.84. For the Durbin-Watson test the value obtained (2.07) falls within the acceptance region of the hypothesis of error independence.

	Coefficient	t test
Intercept	0.213	2.851*
Independent variable	- 0.011	0.100

(*) - significant at the 0.05 level.
R² = 0.00026

The sign of the ratio of the independent variable is negative, which is contrary to H.3¹⁵

The coefficient of the independent variable is not statistically different from zero, which makes losses carried forward an irrelevant factor in the explanation of financial policy .

We can thus conclude that tax savings from losses carried forward does not seem to have any significant influence on the financial policy of companies. Nevertheless, this result should not be taken as being proof of the irrelevance of their fiscal situation as far as financial choice is concerned. In the year under study (1989), the ITC could have been an even more important means of tax saving, as an alternative to debt, thus minimising the role of losses carried forward.

6. Conclusions

The main conclusion to be drawn from the empirical analysis is that in the period under survey the Portuguese manufacturing industry corporations showed distinct behaviour in terms of the evolution of their capital structures. There is therefore a first sub-period, related to the years of 1986 and 1987, which when compared with the previous reference period (1984 and 1985), shows a considerable increase in the importance of equity; there is also a second period (1988 and 1989) in which capital structures maintained stability.

Taking into account the abundance of tax incentives towards the increase of equity set up in the first sub-period, and the observed increase in the weight of equity in capital structures we can conclude for the relevance of taxation as a determining factor in company financial policy within this sub-period. This relationship between tax incentives and the variation of the relative importance of equity in capital structure is even more evident in stock exchange listed corporations.

This first conclusion gives a clue for further reflection: to what measure did the objectives of the adopted policy of tax incentives achieve its intended results in the long term? According to article 1 of

¹⁵ The way the hypothesis is stated seems to suggest a negative sign in the independent variable. However, companies with losses carried forward present negative values for the ratio accumulated losses/profit before taxes and, hypothetically, lower values for debt change, whereas those companies with a positive ratio would also present positive values for debt variation.

the Tax Benefit Law “... tax benefits are considered as being measures of an exceptional nature, established for the protection of relevant extra-fiscal public interest, superior to the interest of the forgone taxation”.

The benefits then granted to listed corporations, or to those awaiting listing in the stock exchange, had a double objective: to develop the stock market and provide both listed companies and those intending to become listed with more solid - i e, less debt dependent - capital structures. Research into the stock market behaviour of companies that benefited from these incentives after 1989 is a theme of undeniable interest for the Portuguese tax policy makers. Some recent studies on this topic is not particularly optimistic.¹⁷

The second important conclusion to be drawn from this paper is that between 1987 and 1989 there were no significant changes in the capital structure of corporations of the manufacturing industry. Given the relative stability of the fiscal framework of income from equity and debt in 1988 and 1989, the possibility that this stability could have influenced the constancy of capital structure indicators cannot be denied.

The change in the Portuguese company capital structure occurred within a fiscal system as a result of the set up of various benefits. The reform carried out, in terms of the fiscal attraction of income from equity and debt, showed little or no influence in financial decision making.

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¹⁷ Ferreira J. (1997) states that: “None of the 12 companies (textile) which joined the stock market in the 80’s, has survived without interruption. Apart from few exceptions... all accumulated losses”. See Martins (2001) for a discussion.

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