“The determinants of Italy’s corporate tax rates: an empirical investigation”

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ARTICLE INFO	Valentino Parisi (2016). The determinants of Italy’s corporate tax rates: an empirical investigation. *Public and Municipal Finance*, *5*(4), 7-14. doi:10.21511/pmf.05(4).2016.01
DOI	http://dx.doi.org/10.21511/pmf.05(4).2016.01
RELEASED ON	Monday, 26 December 2016
JOURNAL	"Public and Municipal Finance"
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
0	0	0

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The determinants of Italy's corporate tax rates: an empirical investigation

Abstract

This paper examines the determinants of the effective corporate tax rates in Italy in the years 1998-2006. While from its inception in the early 1970s, the Italian business income tax regime changed only marginally for over twenty years, in the period between 1998 and 2006, the corporate tax system underwent two major reforms with the declared objective of simplifying the system and reducing the tax burden on firms. Therefore, from a tax policy perspective, the author believes Italy is an interesting case study. The empirical analysis is based on a strongly balanced panel with 5,134 companies that combine company accounts and firm survey data. The author employs a fixed effects panel regression to study the role of size, the debt ratio, the rate of profitability, labor productivity, the assets composition, and internationalization in explaining heterogeneity among firms and, therefore, their effective corporate tax rate. Furthermore, the author employs a quantile regression to analyze the impact of the variation in the effect of independent variables on the effective corporate tax rate at different quantiles of the distribution, thus, providing information on the degree of heterogeneity in firm behavior with the final aim of capturing non-linear effects of the independent variables on the tax rate.

Keywords: effective corporate tax rates, tax heterogeneity, panel regression, Italy.
JEL Classification: H25, H32.

Introduction

The evolution of corporate tax systems has always been at the heart of policy makers debates, as well as public finance academics. It is well understood that company taxation can have large effects on firms' investments (performance) impinging directly on the incentive to accumulate capital which represents one of the main drivers of economic growth.

Then, it is not surprising that starting from the mid-80's, many OECD countries have undertaken significant reforms of their business tax system to reduce nominal corporate tax rates and this trend shows no sign of stopping.

Reductions of the statutory corporate tax rates are, in general, deemed desirable in order to reduce the distortionary effects of corporate taxation on investments in way to foster firms' competitiveness, as well to attract foreign investments.

The downward pressure on capital tax rates can be justified on the basis of increased globalization that has characterized the world at least in the last two decades. In order to attract internationally mobile capital, governments have to offer a business environment at least comparable to that of other countries. Profit taxation is clearly a relevant part of that environment. This explains why most countries have reduced their taxes on mobile capital.

In many countries, reductions of nominal tax rates were often combined with a widening of the tax base, mainly achieved through a less generous application of depreciation practices and eliminations or reductions of specific tax credits, in order to preserve the overall tax revenue (Loretz, 2008).

Reductions of depreciation allowances can be also explained considering a common development in the type of economic activity that characterized major industrialized countries. Manufacturing activities have played a minor role in the last decades than in the past, whereas services and financial activities now have a much more important role. As a result, the depreciation allowance on buildings, plant, and machinery (fixed capital), once a cornerstone of most corporate tax structures, has now a minor importance.

Italy was somehow a latecomer to the corporate tax rates cut process. While at the beginning of the 90's Italy's overall statutory corporate tax rates was among the highest in Europe (see Parisi, 2013), in the period between 1998 and 2006, the corporate tax system underwent two major reforms (and many tax changes), both with the declared objective of reducing the tax burden on firms and simplifying the whole system. However, as we will see in section 2, the two regimes envisaged a different tax policy design.

It is clear that because firms are heterogeneous, for instance, in terms of their capital structure or their financial structure, they are subject to different effective tax rates (ETR).

Such rates can be derived using firm-level data relating the tax paid by the company to some aggregate item of the company accounts, such as gross profits or gross operating surplus. As they consider the various features of the tax system (depreciation allowances, definition of the tax base, carry-forward losses provisions application of specific tax credits),

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they give a precise measure of the effective tax burden supported by the firm[1]. Such rates are especially appropriate if the objective is to study the effects of the tax system on enterprise cash flows and to focus on distributional burdens (for instance, at sectoral level or on firms of different size).

An important policy issue for tax authorities, therefore, concerns what firm features are likely to drive the effective tax rate away from the statutory rate and to what extent. This can also help policy makers to better design their reforms or better target their decisions when comparing different policy options.

Several studies on the determinants of the effective corporate tax rates have been conducted for various countries (see, for instance, Gupta and Newberry, 1997; Desai and Dharmapala, 2006; Dyreng et al., 2008; Hanlon and Heizman, 2010; Minnick and Noga, 2010; Armstrong et al., 2012; Richardson and Lanis, 2007; and, more recently, Kraft, 2014).

In particular, these studies analyze whether and to what extent specific variables like company size, the rate of profitability, the firms' capital structure and assets mix relate to the corporate tax rates.

This paper presents a microeconometric analysis of the determinants of effective corporate tax rates in Italy for the period 1998-2007. From a policy perspective, we believe Italy is an interesting case to study and to our knowledge, no empirical research exists addressing this issue for Italy.

Our analysis uses a large panel of 5,134 corporations of the manufacturing sector combining firms' survey data available from several waves of the Survey on the manufacturing enterprises carried out by the Italian Banking Group Unicredit every three years, and company accounts.

The paper is organized as follows. Section 1 outlines the main features of the two reforms enacted in the period under examination. Section 2 describes the dataset used in the empirical analysis while section 3 illustrates the econometric strategy. Results are, then, discussed in section 4 and the final section offers concluding remarks.

1. The corporate tax reforms in Italy: an outline

As said, Italy was somehow a latecomer to the corporate tax rates cut reforms initiated by most countries in the mid 80's. Indeed, from its inception, its business income tax regime changed only marginally for over twenty years and until the mid 90's, Italy moved in the opposite direction than other industrialized countries, actually increasing the corporate tax rate mainly due to its budgetary constraints. In 1994, the system contemplated a corporate income tax (IRPEG) with a rate of 37%, an additional local profits tax (ILOR) with a rate of 16.2%, a tax on the company net assets of 0.72%. The combined rate amounted to 53.95%, among the highest in Europe.

Then in the period between 1998 and 2006, the corporate tax system underwent two major reforms, one in 1998 and the other one in 2004, both with the declared objective of reducing the tax burden on firms and simplifying the whole system[2]. Recently, in 2012, the system was reformed once again, but the analysis of the possible impact of this reform is outside the scope of this paper due to lack of data.

The main objective of the 1998 reform was a selective reduction in the burden of taxation aimed at narrowing the tax distortion between equity and debt financing, existing in the previous regime (as well as in any system that provides interest costs deductibility). To this end, the main change enacted by the reform was the introduction of an Allowance for Corporate Equity (ACE) in replacement of the previous uniform tax rate system. The new regime also set the abolition of the local tax on profits and net assets, and the introduction of a regional tax (IRAP) on firms' value added[3], with a rate of 4.25% in replacement of the repealed taxes.

The ACE system worked as a dual-rate schedule, where overall profits are divided into two components. The first approximates normal profits, representing the opportunity cost of new financing with equity capital, compared to other forms of capital investments, and it is taxed at the preferential rate of 19%[4]. The second component of overall profits is computed residually from total profits after normal profits and are taxed at the prevailing statutory rate (37% from 1998 to 2000, then, cut to 36% in 2001).

From 1998 to 2000, the combined overall company tax rate was 41.25%, reduced to 40.25% in 2001-2002 though the 'average' statutory tax rate could be much lower depending on the amount of profits qualifying for the ACE (Oropallo and Parisi, 2007).

[1] Such effective tax rates are also defined as backward-looking indicators, because they are calculated on past investment decisions of the firm. In evaluating the impact of corporate taxes on enterprise activity, the empirical literature offers another type of indicators, the forward-looking (marginal, average) tax rates (Devereux and Griffith, 1998). Such rates measure the theoretical tax burden falling on a hypothetical investment and are particularly appropriate to analyze how the tax system affects company investment decisions. Being simplified measures, forward-looking indicators do not take into account the complexity and the interaction of all elements of the tax system that crucially alter effective company taxation.

[2] This section draws on Parisi (2013).

[3] This is a regional tax paid by corporations and unincorporated firms on their value added net of depreciation and amortizations, i.e., with no deduction of interest expense and labor costs from the tax base. Therefore, IRAP strengthens the neutrality features of the overall corporate tax system.

[4] The system enacted in Italy was actually a restricted version of a pure ACE regime, where normal profits are exempted from corporate taxation.

The ACE regime remained in place until the beginning of 2004 when a new reform was introduced. The 2004 regime moved back to a uniform tax rate system with a statutory rate of 33% and set some changes to the definition of the corporate tax base. More specifically, the reform introduced a participation-exemption regime, repealed the full imputation of dividends, and brought in an optional consolidated tax statement for corporate groups, in this way attaining, in the policy maker's proposals, simplification in the tax base computation.

The 2004 system remained in place until 2012 when an ACE allowance (where the acronym in this case stands for *Aiuto per la Crescita Economica-Aid for the Economic Growth*), similar to the 1998 scheme, was re-introduced[5]. As said above, the effects of this reform are beyond the scope of this paper because of lack of data.

2. Data and descriptive statistics

The empirical analysis is based on a strongly balanced panel with 5,134 companies covering the years 1998-2006. Therefore, on the whole, the analysis uses 46,206 observations. Data combine company accounts and firm survey data available from the Unicredit Bank. The data collection started in 1972 and has been performed through a questionnaire submitted to a sample of firms of the manufacturing sector every three years. Size class, geographical area, and industry to be representative of the population of Italian manufacturing firms with more than 1 employees stratify the sample. Company accounts are collected by CERVED, a consortium of private equity funds that evaluates businesses reliability and their financial structure, and are available for the entire corporate sector (about 700,000 companies) and throughout the entire period considered in this paper.

The final dataset contains information on firm's features (size, employment structure, legal status, participation in groups), and firm's activities (investments, internationalization, finance). The company accounts cover the information needed to compute the effective corporate tax rates, as explained below.

Table 1 offers a breakdown of the companies present in the dataset by Pavitt activity sector and size (number of employees).

Table 1. Number of companies present in the dataset by Pavitt sector and firm size. Year 2006

	Number	*%*
Pavitt sector of activity		
Traditional sectors	2,552	49.7
Scale sectors	974	19.0
Special sectors	1,374	26.8
High-tech sectors	234	4.6
Total	**5,134**	**100.0**
Size (number of employees)		
1-10	520	10.1
1-20	1,326	25.8
21-50	1,662	32.4
51-100	801	15.6
101-500	642	12.5
More than 500	183	3.6
Total	**5,134**	**100.0**

Source: own calculations.

The majority of firms of the sample belong to traditional (49.7%) and special sectors (26.8%), while only 4.6% of firms produce in high-tech sectors. Furthermore, the majority of firms (about 68%) can be qualified as small-medium sized enterprises, employing up to 50 workers, in line with the well-known features of the Italian manufacturing sector.

Table 2 offers a breakdown of firms reporting fiscal losses and, therefore, exempt from corporate taxation or claiming a tax credit, and our main variable of interest, the mean effective corporate tax rate (ETR) calculated as the ratio between the tax actually paid by the company in that given year resulting from the balance sheet over the firm operating surplus which represents profits before interests, taxes, depreciation and amortization.

Table 2. Number of companies that do pay corporate taxes or claim a credit. Years 1998-2006

	Firms with losses (%)	Effective corporate tax rate (ETR)
1998	38.3	44.3
1999	36.4	45.3
2000	36.3	43.9
2001	36.4	41.0
2002	38.1	39.1
2003	39.2	43.8
2004	35.8	44.3
2005	35.7	44.7
2006	35.6	45.2

Source: own calculations.

Figures in Table 2 show that in 1998, 36.4% of companies of the dataset did not pay corporate taxes or claimed a fiscal credit[6]. This percentage slightly declined in the last years considered in our analysis and amounts to 35.6% in 2006.

[5] In the actual system, the statutory rate is 27.5%. Normal profits derive from net annual capital increase multiplied by the imputed rate of 3% and are deducted from taxable profits in line with the ACE scheme.

[6] In Italy, fiscal losses can be brought forward up to five years, while there are no tax carry-back rules.

Finally, the corporate tax rate falls from 47.3% in 1997 to 39.1% in 2002, and, then, increases to 45.2% in 2006. Obviously, part of trend of the implicit rate depends on the dynamics of the operating surplus. Further examination of this aspect is beyond the scope of this paper.

3. The empirical analysis

In this section, we discuss the econometric strategy that we follow to estimate the relation between the implicit corporate tax rates and its determinants. More specifically, we estimate the following model:

$$ETR_{it} = \beta_0 + \beta_1 \log SIZE_{it} + \beta_2 DEBT\_RATIO_{it} + \beta_3 CAP\_INT_{it} + \beta_4 R\&D\_INT_{it} + \beta_5 INV\_INT_{it} +$$
$$+ \beta_6 ROA_{it} + \beta_7 \log LAB\_PROD_{it} + \beta_8 \log AGE_{it} + \beta_9 INTERNAZ_{it} + \varepsilon_{it}. \quad (1)$$

The dependent variable (ETR_{it}) is the effective corporate tax rate for company i in the year t.

Most of the regressors included in eq. (1) are in line with other studies on the determinants of the effective corporate tax rate and are described below.

SIZE (either measured as total sales or total assets) is the variable most widely studied in the literature. However, the sign of the relationship between this variable and the ITR remains ambiguous.

As pointed out by Zimmerman (1983), the political cost theory suggests that corporate taxes are the "political costs" that larger firms bear as a consequence of greater political scrutiny to which they are exposed. As political costs force larger firms to adjust their behavior to what the external environment expects, they have scarce propensity to reduce their tax rate, because they know this would result in greater public control.

However, one might argue that in practice, larger companies are more able to carry out tax planning activates, take advantages of specific tax breaks, adopt favoring accounting practices than smaller companies. In this respect, larger firms could be subject to lower ETRs.

In our analysis, SIZE is measured by the log of company total assets.

Another variable extensively studied in the literature is the leverage ratio (Plesko, 2003; Liu and Cao, 2007; Rohaya et al., 2010; Wu et al., 2012). As in most tax systems interest costs are deductible from the corporate tax base, a higher leverage ratio results in lower ETRs. So we expect a negative relationship between the debt ratio and the ETR. Here, we use both short and long term financial debts.

Corporate tax rates are also influenced by the composition of company assets. Therefore, in our regression, we include the ratio between fixed assets (land and buildings, plant, equipment) and total company assets, CAP_INT, as a possible determinant of ETR.

In principle, we expect a negative sign. More capitalized firms experience more favorable depreciation deductibility and, therefore, lower ETRs. Moreover, due to the application of different depreciation schemes, usually more capitalized firms can benefit from differences between book and tax accounts.

However, in empirical studies, the consensus on the direction of the relationship between capital intensity and the corporate tax rate is not unanimous. A negative relationship is demonstrated in Gupta and Newberry (1997), Wilkinson et al. (2001), Plesko (2003), and Wu et al. (2012). On the opposite, Harris and Fenny (2000), Liu and Cao (2007) do not find a statistically significant relationship between these variables.

When we take into account the assets composition, we also have to consider the inventory intensity, INV_INT, expressed by the ratio between stocks and total assets. In principle, there might be a substitution effect between stocks and fixed assets investments, meaning that inventory investments can be considered alternative to non-current assets investments, thus, reducing the possibility of benefitting of lower ETRs. As a result, we expect a positive association between INV_INT and the ETR.

The consensus among researchers on the sign of this relation is not unanimous. Again, Gupta and Newberry (1997), Richardson and Lanis (2007), Fernandez et al. (2011), Wu et al. (2012) find a positive and significant relation, whereas Derashid and Zhang (2003) and, more recently, Rodriguez and Arias (2014) do not find a significant association.

We also consider the effects of research and development (R&D) expenses on the ETR, measured by the R&D intensity, the ratio between R&D expenses and total sales. We expect a negative relation between this variable and the ETR due to the fact that in many tax systems, R&D expenses benefit from specific fiscal allowances either in terms of higher depreciation rates and/or tax reliefs.

Clearly also firm's profitability and labor productivity have an impact on the ETR. In this paper, firm's profitability is measured by the well know Return On Assets (ROA) indicator, the ratio between operating surplus and company assets, while labor productivity is expressed by the log of valued added per employee.

In principle, more profitable firms earn higher gross profits and, therefore, are subject to a higher tax rate. Indeed, some authors (Gupta and Newberry,

1997; Plesko, 2003; Delgado et al., 2012; Wu et al., 2012; Armstrong et al., 2012) find a positive association between the profitability rate and the ETR. A similar reasoning regards labor productivity, although this variable has been rarely introduced in the literature perhaps due to lack of information on the employed labor force in the data.

On the contrary, one might argue that more profitable or productive firms are more efficient also in investing financial resources in tax planning activities that may result in lower tax burdens. Recently, Kraft (2014) documents a negative impact of profitability on the corporate tax rate which goes in this direction.

Therefore, the sign of both variables on the ETR remains an open question. We also include firm's age (in log) among the possible determinants of the ETR. It is difficult to predict the sign of the association between the two variables.

Lastly, we analyze also the effects of internationalization on the effective tax burden. On the basis of our data, we consider two internationalization strategies and therefore two groups of firms: firms exporting and/or making trade agreements with foreign firms; firms delocalizing their activity or carrying out FDI. We expect firms belonging to the latter group to benefit from a lower tax burden.

To estimate eq. (1) we run a fixed effects model[7]. Results are discussed in next section.

Table 3 reports some summary statistics (mean, standard deviation) of the variables used in the empirical analysis.

Table 3. Mean and standard deviation of the main independent variables used in the empirical analysis (years 1998-2006)

	log SIZE	DEBT_RATIO *	CAP_INT*	R&D_INT*	INV_INT*	ROA*	log LAB_PROD	log AGE
Mean	15,354	0,211	0,120	0,002	0,195	0,048	2,821	9,159
SD	1,191	0,260	0,152	0,023	0,139	2,652	0,935	1,062

Source: own calculations.
Legend: * percentage values.

4. Discussion of results

Table 4 reports the results of the panel regression.

Table 4. Fixed effects panel regression estimates

Independent variables	Effective corporate tax rate (ETR)
log SIZE	0.0090**
	(0.0030)
DEBT_RATIO	-0.0853***
	(0.0080)
CAP_INT	-0.0805***
	(0.0142)
INV_INT	0.1126***
	(0.0179)
R&D_INT	-0.2639***
	(0.1021)
ROA	-0.2562***
	(0.0316)
log LAB_PROD	-0.1162***
	(0.0017)
log AGE	0.0431***
	(0.0047)
INTERNAZ 1	0,0047
	(0.0041)
INTERNAZ 2	-0,0082**
	(0.0241)
Constant	1.3577***
	(0.0489)
Observations	46,206
Number of firms	5,134
R-squared	0.3127

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.
Source: own estimations.

The coefficient of the log of SIZE is positive and statistically significant at the 5% level. This result supports the suggestions of the political costs theory discussed in the previous section. Additionally, we can also argue that Italy's corporate tax system does not give specific advantages to larger companies.

A higher debt ratio is associated with a lower ETR. The estimates reveal that an increase of 1 percentage point in the debt ratio reduces the tax rate of 0.09 percentage points.

Italy offers and interesting case study to analyze the relation between the debt ratio and the corporate tax rate. The application of the ACE system lowered the debt ratio in the years 1998-2002 with a stronger impact on more leveraged firms (see Parisi, 2013), whereas less indebted firms still had a preference for debt financing. This result can be traced to the fact that the allowance worked as a partial version of an ACE, where the cost of equity funded investments was only partially deductible from the tax base, while the cost of debt funded investments was fully deductible (see note 4). Therefore, the system still offered a tax subsidy to debt financing and the incentive to take advantages of this subsidy was higher for less leveraged firms because of the lower bankruptcy costs they face compared to highly indebted firms. The estimation results confirm this conclusion.

[7] To establish whether a fixed or a random effects model should be used, we run the Hausman test. Results show that a fixed effects model is more appropriate. Such models control for omitted variables bias, i.e., the effects of time-invariant differences between firms.

More capitalized firms bear a lower corporate tax rate. This result is in line with the literature mentioned in the previous section. Here we note that the magnitude of CAP_INT coefficient is 0.08, meaning that a 1% increase of the fixed assets intensity lowers the ETR by 0.08 percentage point.

The stock intensity enters positively the estimated equation (0.11) and the variable is statistically significant: in line with the theoretical predictions, a higher proportion of stocks on company assets can be viewed in substitution of fixed assets investments resulting in a higher ETR.

The coefficient for the R&D_INT is negative and statistically significant (-0.26) supporting the prediction that a higher R&D intensity lowers the corporate tax rate because of the various fiscal advantages associated with these expenses.

We now turn to profitability (ROA) and the log of labor productivity (log LAB_PROD). Both variables are statistically significant and have a negative sign (respectively, -0.26 and -0.12), showing that more productive and/or more profitable firm are more able to channel their resources to tax planning in order to reduce their actual corporate tax rate.

The coefficient of the log of age is positive and significant at the 1% level (0.04): more mature firms tend to be associated with a higher tax rate. One possible explanation of this result can be traced again to the political cost theory, in the sense that more mature firms (similarly to larger firms) could be subject to greater political scrutiny compared to younger firms and, therefore, bear a higher corporate tax burden.

Finally, looking at the impact of internationalization on the ETR, we see that firms delocalizing their activity or carrying out FDI are more able to reduce their corporate tax liability (the coefficient for INTERNAZ 2 is -0.008 and it is statistically significant at the 5% level), whereas the exporting strategy (INTERNAZ 1) is not statistically relevant.

If we assert that firms are heterogeneous and, therefore, subject to different ETRs, then, it is possible that the effects of the independent variables are not the same along the distribution of the ETR. Standard regression methods assume that the distribution of ETR conditional on the independent variables is homogeneous, meaning that estimates of the relationship between the ETR and the independent variables are the same no matter what point of the distribution is considered.

To address this issue, we employ a quantile regression (see Koneke and Hallock, 2001). This method allows analyzing the impact of the variation in the effects of independent variables on the ETR at different quantiles of the ETR distribution. In practice, quantile regression provides information on the degree of heterogeneity in firm behavior with the final aim of capturing non-linear effects of the independent variables on the ETR.

We employ a generalized quantile regression and the results are reported in Table 5. We consider three quantiles: q=0.25, q=0.5 (the median), and q=0.75.

The estimated coefficients can be interpreted as the partial derivatives of the conditional quantile of the dependent variable (ETR) with respect to a given regressor, i.e., the marginal change of the ETR at the given conditional quantile due to a marginal change in the regressor.

For each quantile, it is possible to study whether the effect of a particular regressor is positive or negative, as well as to compare the magnitude of this effect with other quantiles.

Table 5. Quantile regression estimates

	Effective tax rate (ETR)		
Independent variables	q=0.25	q=0.5	q=0.75
log SIZE	0.0110***	0.0143***	0.0144***
	(0.0027)	(0.0021)	(0.0021)
DEBT_RATIO	0.1523***	0.1820***	0.1944***
	(0.0135)	(0.0105)	(0.0103)
CAP_INT	0.0566***	0.0388***	0.0600***
	(0.0136)	(0.0096)	(0.0104)
INV_INT	0.1570***	0.1579***	0.1800***
	(0.0162)	(0.0117)	(0.0121)
R&D_INT	0.4830***	0.4550***	0.4157***
	(0.1317)	(0.0864)	(0.0580)
ROA	0.4930***	-0.3170**	0.0762
	(0.1655)	(0.1420)	(0.1478)
log LAB_PROD	0.0987***	0.1203***	0.1382***
	(0.0101)	(0.0073)	(0.0070)
log AGE	0.0306	0.0198***	0.0151***
	(0.0022)	(0.0016)	(0.0016)
INTERNAZ	0.0204***	0.0108***	-0.0048*
	(0.0032)	(0.0023)	(0.0025)
Constant	1.0372***	1.3555***	1.6666***
	(0.0510)	(0.0300)	(0.0273)

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1.
Source: own estimations.

Generally, for all the independent variables, quantile regression estimates confirm the signs of the coefficients obtained through the fixed effects regression, as well as their statistical significance. So, in the discussion, we just focus on the magnitude of the effects by quantiles.

The log of SIZE has a stronger influence in reducing the ETR on mid-upper quantiles. This result is predictable, as political costs tend to increase moving to upper quantiles of ETR.

As expected, the negative impact of the debt ratio on ETR increases for higher quantiles: the fiscal advantage of using debt clearly increases for firms paying higher effective corporate tax rates.

The effects of each regressor depend also on how firms with specific features (capital intensity, R&D intensity, profitability, productivity and so on) position along the distribution.

This can explain the trend of the asset composition effects on the ETR. In absolute value, the impact of CAP_INT is greater for the I and III quantiles, whereas the (positive) effect of INV_INT is higher for the third quantile.

As it concerns the R&D_INT, the estimates show that its impact on the ITR is negative for all quantiles with a higher effect on the III quantile.

The (negative) effects of ROA is statistically significant only for the I and the II quantile, whereas LAB_PROD exerts a higher (negative) impact on the III quantile.

In the case of quantile regression, we cannot analyze separately the effects of the two internationalization strategies on the ETR. Therefore, INTERNAZ is considered as a continuous variable. Results show that more internationalized companies benefit from lower ETRs, but this effect is smaller for firms belonging to the III quantile.

Conclusion

In this paper we have analyzed the determinants of ETRs for Italy in the years 1998-2006. We use a rich dataset which builds on a panel of 5,134 companies of the manufacturing industry integrating balance sheets data with information on the employed labor force, company investment behavior, internationalization strategies carried out by the firm.

The results show that size, the debt ratio, the asset composition (capital intensity, inventory intensity), the profitability rate, the intensity of R&D expenses, labor productivity are all statistically significant variables in determining the magnitude of the ETR. These results are actually in line with previous literature conducted for other countries and discussed in the paper.

Estimates are obtained by means of a fixed effects panel regression. However, if firms are heterogeneous and, therefore, subject to different tax rates, then it is possible that the effects of the regressors are not the same along the distribution of the ETRs.

To address this specific issue, we employ a quantile regression. This method allows to analyze for each quantile whether the effect of a particular regressor is positive or negative, as well as to compare the magnitude of this effect with other quantiles, therefore, capturing possible non-linear effects of the independent variables on the ETRs.

Generally, for all the independent variables considered in the analysis, quantile regression estimates confirm the signs of the coefficients obtained through the fixed effects regression, as well as their statistical significance. However, the magnitude of the effects of the regressors tends to vary across quantiles.

We also include firm's internationalization behavior as a possible determinant of the ETR. Estimates show that more internationalized firms bear lower corporate tax rates.

As known, corporate tax reforms is a highly debated issue in most countries. This can be explained on the basis of the tax competition forces that, in an increasingly globalized world, have pushed governments to reduce tax rates on firms and, more generally, mobile capital. In this respect, we believe that understanding what the actual drivers of corporate tax rates are can be of crucial importance to help government in designing their tax reforms.

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