Analyzing the determinants of effective tax rate

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Abstract. *This paper presents a topical issue for economic research nowadays, the effective tax rate being the most important aspect of all research in the field of corporate taxation. In this paper, we present a few theoretical approaches and computational methods used in order to determine the effective tax rate, research, approaches and theories studied over time and realize an empirical study using Romanian companies listed oh the Bucharest Stock Exchange. The study aims to highlight the factors that affect the effective tax rate and has a very high relevance to the optimization of the tax burden across the enterprise.*

Keywords: effective tax rate, statutory rate, corporate social responsibility, methodology

Introduction

In the context of the current instability caused by the economic crisis, more intense in the recent years, given that public debt levels in European countries increased threatening the existence of the euro area, fiscal policy is one of the main tools that can be used. Thus, the literature is focusing on the tax rates of profit, especially on the effective tax rate.

This paper presents a number of approaches studied over time at both macroeconomic and microeconomic level, focusing mainly on determining the factors that influence the effective tax rate of profit. Starting from the idea that the profitability of a company may be influenced by the taxation of profits and taking into consideration the fact that tax is deducted from gross profit to obtain net profit, it becomes very important to determine effective tax rates.

Literature review

Effective corporate tax rates are those that take into account, in addition to statutory tax rate, other aspects of tax systems that affect the amount of tax actually paid. Economic studies (Nicodeme, 2001: Beer, 2005: Blechova and Barteczkova, 2008) offer different approaches in determining the effective tax rate. Thus, we identify three mehodologies for measuring the effective quota: the macro backward-looking methodology, the micro backward-looking methodology and the micro forward-looking methodology.

Regarding the determinants of effective tax rate, numerous studies demonstrated that the factors used in order do influence ETR are represented by firm size, leverage, profitability, debt, the intensity of inventories and the intensity of capital (Gupta, Newberry, 1997; Derashid, Yhang, 2003; Adhikari, 2006; Guha, 2007; Wu et al., 2012; Lazăr, 2011; Richardson, Lanis, 2007; Vintilă el al., 2012, Cârstea, Dascălu, 2013) and various elements of corporate social responsibility (Richardson, Lanis, 2011; Desai, Dharmapala, 2004; Huseynov, Klamm, 2012; Minnick, Noga, 2010; Vintilă et al., 2012).

There are also two different views on the correlation between effective tax rate and company size (Wu et al., 2012): the political cost theory and the theory of political power. Political cost theory argues that transparency in large and profitable companies make them become victims of government regulatory actions. Given that taxes are part of the political costs

incurred by firms, this theory concludes that the largest firms have the highest effective tax rates. An alternative vision called political power theory argues that large firms have the lowest effective tax rates because the possess substantial resources to manipulate the political process in their favor by engaging in tax planning processes and organization of activities in order to achieve optimal tax economies.

Case study

In our empirical study, we used micro backward-looking methodology for determining the effective corporate tax rates using analysing data from the financial statements of Romanian companies listed on the Bucharest Stock Exchange.

The dependent variable used is the effective tax rate, being equal to the ratio of tax expenditures and gross profit. This method is most commonly used because it reflects best the incidence of taxation and business. The independent variable were initially considered to be more, but we tested several models for different groups of companies and over a different period of time, until we obtain valid models. Thus, the initial database considered the natural logarithm of total assets (the natural logarithm of turnover) to see the influence of company size on ETR, the leverage of the company, capital intensity, inventory intensity, firm performance and two dummy variables: the value 1 will be returned if the company is large and if the company is part of SMEs, the variable will return the value 0 (dummy1 depends on turnover and dummy2 depends on total assets).

***Model 1*:** $\mathbf{ETR_{it} = \beta_0 + \beta_1 \times ROE_{it} + \beta_2 \times INVINT_{it} + \beta_3 \times CINT_{it} + \beta_4 \times DUMMY1_{it}}$

***Model 2*:** $\mathbf{ETR_{it} = \beta_0 + \beta_1 \times [ln\ (AT)]_{it} + \beta_2 \times ROE_{it} + \beta_3 \times CINT_{it} + \beta_4 \times INVINT_{it} + \beta_5 \times LEV_{it}}$

Table 1. The results of the correlation between ETR and determinants of ETR

Model/Independent variable	**SIZE**	**CINT**	**INVINT**	**DEBT**	**Rate of Return**
Model 1	-	-	-	N/A	-
Model 2	-	+	-	+	-
Cârstea F, Dascălu, L. (2012)	+	+	+	-	-
Vintilă et al. (2012)	-	-	-	+	N/A
Hsieh (2012)	-	-	+	+	+
Md. Noor et al. (2010)	+	-	+	-	-
Richardson and Lanis (2007)	-	-	+	-	+
Adhikari et al. (2006)	-	-	-	+	-
Derashid and Zhang (2003)	-	-	-	-	-
Gupta and Newberry (1997)	+/-	-	+	-	+

The results of the first model show that ETR is negatively correlated with all the independent variables (company size, return on equity, capital intensity and inventory intensity) and in the second model we obtain that ETR is positively correlated with leverage and capital intensity and negatively correlated with the other endogenous variables (company size, intensity inventories and the rate of return). Literature itself also provides mixed results in terms of the correlation between the endogenous and exogenous variables. All this, coupled with the fact that independent variables of the models obtained explained only in a proportion of 46% and 45% the dependent variable makes us conclude that, in addition to the factors stated by us or those found in the numerous studies cited in this paper, there are certainly other influences which may belog to: corporate social responsibility, tax planning, tax management.

Conclusions

Given the fact that our models are valid and the correlations obtained were explined before by numerous studies, we find this paper to be significant for the economic studies from out country, but we have to account the fact that independent variables of the models obtained explained only in a proportion of 46% and 45% the dependent variable makes us conclude that, in addition to the factors stated by us or those found in the numerous studies cited in this paper, there are certainly other influences. Therefore, this research will not stop here, remaining for the future to test models with as many variables as possible, for different time periods and for different types of companies and sectors.

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Annexes

Model 1

Hausman Test

Correlated Random Effects - Hausman Test
Pool: POOL2
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.126131	4	0.7126

Output from eviews (random effects)

Dependent Variable: ETR?
Method: Pooled EGLS (Cross-section random effects)
Date: 05/26/14 Time: 12:25
Sample: 2006 2012
Included observations: 7
Cross-sections included: 22
Total pool (balanced) observations: 154
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.511307	0.071581	7.143016	0.0000
ROE?	-1.056842	0.199008	-5.310555	0.0000
INVINT?	-0.103610	0.133616	-0.775430	0.0931
CINT?	-0.016732	0.091593	-0.182675	0.0855
DUMMY1?	-0.175134	0.045712	-3.831241	0.0002
Random Effects (Cross)				
Cross-section random			0.005813	0.0010
Idiosyncratic random			0.184140	0.9990

Weighted Statistics			
R-squared	0.480075	Mean dependent var	0.253644
Adjusted R-squared	0.469137	S.D. dependent var	0.204466
S.E. of regression	0.182979	Sum squared resid	4.988700
F-statistic	10.51100	Durbin-Watson stat	1.940239
Prob(F-statistic)	0.000000		

Unweighted Statistics			
R-squared	0.480025	Mean dependent var	0.254527
Sum squared resid	4.993033	Durbin-Watson stat	1.938555

Model 2

Hausman Test

Correlated Random Effects - Hausman Test
Pool: POOL1
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	15.126128	5	0.0098

Output from Eviews (fixed effects)

Dependent Variable: ETR?
Method: Pooled Least Squares
Date: 05/26/14 Time: 12:43
Sample (adjusted): 2005 2013
Included observations: 9 after adjustments
Cross-sections included: 12
Total pool (balanced) observations: 108

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.179082	0.066422	2.696104	0.0084
D(LOG(AT?))	-0.004084	0.041213	-0.099088	0.0921
ROE?	-0.659191	0.177837	-3.706712	0.0004
CINT?	0.146170	0.087358	1.673235	0.0977
INVINT?	-0.113951	0.387931	-0.293741	0.1370
LEV?	0.021449	0.033848	0.633670	0.0928
Fixed Effects (Cross)				
Cross-section fixed (dummy variables)				

R-squared	0.464238	Mean dependent var	0.190964
Adjusted R-squared	0.452456	S.D. dependent var	0.086701
S.E. of regression	0.074962	Akaike info criterion	-2.200127
Sum squared resid	0.511357	Schwarz criterion	-1.777940
Log likelihood	135.8069	Hannan-Quinn criter.	-2.028945
F-statistic	3.258459	Durbin-Watson stat	1.911827
Prob(F-statistic)	0.000083		

Descriptive statistics

	C	CA	AT	ROA	ROE	LEV	CINT	INVINT	RMJ	DEBT	ETR	DUMMY1	DUMMY2
Mean	1	1.61E+09	2.97E+09	0.07	0.106	0.4789	0.55182	0.0966	0.1007	0.272	0.1933	1	1
Median	1	1.93E+08	2.11E+08	0.07	0.101	0.3613	0.52611	0.0913	0.0747	0.246	0.1698	1	1
Maximum	1	1.95E+10	3.51E+10	0.2	0.295	2.462	0.95472	0.2708	0.2926	0.69	0.5603	1	1
Minimum	1	32979308	2.1E+07	0	0.003	0.0872	0.03476	0.0042	0.0022	0.079	0.0015	1	1
Std. Dev.	0	4.00E+09	7.31E+09	0.04	0.06	0.4164	0.2223	0.0625	0.0759	0.149	0.0874	0	0
Skewness	NA	3.158609	3.11225	0.31	0.51	2.1443	-0.0043	0.6376	0.8771	0.92	1.7424	NA	NA
Kurtosis	NA	11.89219	11.8574	2.59	3.221	8.7939	1.83569	3.3712	2.7345	3.078	7.8472	NA	NA
Jarque-Bera	NA	594.8918	585.987	2.76	5.437	259.81	6.77846	8.8199	15.738	16.94	178.19	NA	NA
Probability	NA	0	0	0.25	0.066	0	0.03374	0.0122	0.0004	2E-04	0	NA	NA
Sum	120	1.93E+11	3.57E+11	8.6	12.68	57.462	66.2183	11.591	12.089	32.66	23.192	120	120
Sum Sq. Dev.	0	1.90E+21	6.35E+21	0.2	0.423	20.632	5.88054	0.4651	0.6854	2.653	0.9088	0	0
Observations	120	120	120	120	120	120	120	120	120	120	120	120	120
Cross sections	12	12	12	12	12	12	12	12	12	12	12	12	12