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CORPORATE INCOME TAXATION EFFECTS ON INVESTMENT DECISIONS IN THE EUROPEAN UNION

Ioan Talpoş[1]
Ionel Vancu[2]

ABSTRACT: The link between investment decisions undertaken by economic agents and corporate income (profit) taxation is well documented in theoretical studies realized so far. But, the empirical evidence is very mixed and do not provide clear answers regarding the magnitude of the taxation effects on investment and the proper transmission channels for these effects. So, we propose to investigate the effects of corporate income (profit) tax burden on investment decision for a sample composed from EU Member States.

Key words: corporate income taxation, investment, q theory

JEL codes: E62, O40, C20

Introduction

Investment decisions undertaken by economic agents are very important for the economy as a whole because investments are one of the engines of long-term economic growth.

When an economic agent has to make an investment decision, there are a variety of variables that are taken into account, among which taxation play a significant role. The economic theory suggests that taxation generally distorts the decisions of economic agents and individuals. If one refers only to investment decisions, having in mind that corporate profits are the source of funds used to finance an investment, corporate income taxation seems to be one of its main determinants. The transmission channels of corporate income taxation on investment process and the specific determinant fiscal variables are various: the level and dynamic of marginal tax rate, the level and evolution of average tax rate, the existence of an investment tax credit or the existence of tax-deductible depreciation allowances. It is expected that marginal and average tax rates to have a negative effect on investment decisions. Empirical studies realized so far confirm this assumption and found a stronger effect for marginal corporate income tax rates than for average rates.

Closely related with corporate income taxation, the fiscal treatment of dividends also has an impact on investment decisions. A higher tax rate on dividends constitutes an additional incentive to undertake investments.

Another way in which taxation affects investment decisions is related to capital taxation. Of course, a tax on the stock of capital of an economic agent is a strong disincentive to invest.

Literature review and theoretical foundations

In order to highlight the effects of taxation on investment undertaken by economic agents, we will follow a theoretical model based on q Tobin investment theory developed in Myles (2007). Tobin (1969) argued that the investment decision should be based on some sort of arbitrage between the market value of investment (V) and to the replacement cost (K). When the market value exceeds the replacement cost, the economic agent should realize the investment. In the opposite situation, the investment should not materialize. According to q theory of investment, the investment function is given by:

[1] West University of Timisoara, Faculty of Economics and Business Administration, ioan.talpos@feaa.uvt.ro
[2] West University of Timisoara, Faculty of Economics and Business Administration and Beius Fiscal Administration

$$I = I(q)K \tag{1}$$

where:

$$q = \frac{V}{pK} \tag{2}$$

pK - the nominal value of the capital stock

which satisfies the following conditions:

$$I'(1) = 0 \tag{3}$$

$$I'(q) > 0 \text{ if } q > 1 \tag{4}$$

$$I'(q) < 0 \text{ if } q < 1 \tag{5}$$

If a fraction b of new investment is financed by debt, the economic agent will undertake the investment process only if the following condition is satisfied:

$$\frac{V}{pK} + b - 1 > 0 \tag{6}$$

In order to envisage the taxation effects on investment decision, one could consider a tax credit for the reinvested profit and full tax-deductible future depreciation allowances. In these conditions, the economic agent will carry on the investment if the following inequality holds:

$$\frac{V - B}{pK} + b - 1 + ITC + Z > 0 \tag{7}$$

where:
B – the present value of tax savings on the existing capital stock;
ITC – the tax credit for the reinvested profit;
Z – the present value of future depreciation allowances related with the investment.

If one consider a marginal tax rate for dividends τ_d and a marginal tax rate for income from capital τ_c the economic agent will reinvest that part of the profit that will endure an increase in the market value by $\frac{1-\tau_d}{1-\tau_c}$. In these conditions, the investment will be realized if the following inequality holds:

$$\frac{(V - B)(1 - \tau_c)}{pK(1 - \tau_d)} + b - 1 + ITC + Z > 0 \tag{8}$$

Having in mind that the investment cost is fully deductible from the taxable profit before the tax and the fact that profits are taxed at a rate τ, the q theory is described by the following function:

$$\frac{I}{K} = h(Q), \text{ with } h(0) = 0 \text{ and } h' > 0$$

where:

$$Q = \frac{\frac{(V-B)(1-\tau_c)}{pK(1-\tau d)} + b - 1 + ITC + Z}{1-\tau} \quad (9)$$

The presented model shows that a change in profit tax rate τ could affect only the level of the investment rate (Q) but not its sign. The other tax rates τ_d and τ_c could affect both the level and the sign of the investment rate. It could also be observed that an increase in the tax rate for income from capital could make the investment rate even negative, while an increase in the dividends tax rate has an opposite effect. More, it could be observed that allowing for an investment tax credit has a positive impact on the investment rate.

These interesting theoretic results are confirmed by numerous empirical studies realized in the economic literature. For example, Goolsbee (1998) studied the impact of tax credits and found that a 10 percent investment tax credit raises the prices of investment goods by more than 6.5 percent, and therefore, much of the increase in investment is absorbed in an increase in price rather than an increase in quantity. More recently, Djankov, Ganser, McLiesh, Ramalho and Shleifer (2009) used data from a Pricewaterhouse Coopers enquiry for 85 countries and estimated a significant negative impact of the effective profit tax rates on investment and entrepreneurial activities. Detailing the analysis on the economic sectors, they found that the identified negative correlation is really strong for productive sector investment and is weak and insignificant for services sector.

Research methodology and results

In order to envisage this possible connection between taxation and investment undertaken by economic agents, we estimated a pool data econometric model of the following general form:

$$Y_{it} = \alpha + X'_{it}\beta_{it} + \delta_i + \gamma_t + \varepsilon_{it} \quad (10)$$

where: Y_{it} - dependent variable;

X_{it} - the vector of independent variables;

α - constant;

β - independent variable coefficient;

δ - cross-section effect (fixed or random);

γ - period effect (fixed or random);

ε_{it} - random variable;

i – number of the cross-sections;

t – time period.

Our specific model uses as a dependent variable gross fixed capital formation per capital (KF) and as an independent variable the average tax burden of corporation tax (on profits) (IP).

The sample used for the estimation contains time series for the 2000-2007 period for all the 27 EU member states (Belgium – BE, Bulgaria – BG, Czech Republic – CH, Denmark – DC, Germany – GE, Estonia – ES, Ireland – IR, Greece – GR, Spain – SP, France – FR, Italy – IT, Cyprus – CI, Latvia – LE, Lithuania – LI, Luxembourg – LU, Hungary – UN, Malta – MA, Netherlands – OL, Austria – AU, Poland – PL, Portugal – PG, Romania – RO, Slovenia – SN, Slovakia – SC, Finland – FI, Sweden – SU and United Kingdom – MB). Data used were collected from Eurostat statistical database.

The specific form of our estimated model is the following:

$$\log(KF_{it}) = \alpha + IP_{it}\beta_{it} + \varepsilon_{it} \quad (11)$$

The estimation results are reported in the following table:

Table no. 1

Estimation results

Dependent Variable: LOG(KF?)
Method: Pooled EGLS (Cross-section weights)
Sample (adjusted): 2000 2007
Included observations: 8 after adjustments
Cross-sections included: 27
Total pool (balanced) observations: 216
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (no d.f. correction)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.672744	0.065043	117.9635	0.0000
BE--IPBE	0.290934	0.023726	12.26212	0.0000
BG--IPBG	-0.472052	0.070558	-6.690253	0.0000
CH--IPCH	0.013566	0.025282	0.536600	0.5922
DC--IPDC	0.358236	0.029121	12.30167	0.0000
GE--IPGE	0.717698	0.087554	8.197174	0.0000
ES--IPES	0.056765	0.119975	0.473142	0.6367
IR--IPIR	0.382960	0.033537	11.41906	0.0000
GR--IPGR	0.150313	0.038224	3.932375	0.0001
SP--IPSP	0.255557	0.017090	14.95393	0.0000
FR--IPFR	0.333465	0.031719	10.51308	0.0000
IT--IPIT	0.314411	0.021865	14.37963	0.0000
CI--IPCI	0.069851	0.020100	3.475184	0.0006
LE--IPLE	-0.178394	0.117288	-1.520994	0.1299
LI--IPLI	-0.198142	0.112522	-1.760926	0.0799
LU--IPLU	0.265777	0.021577	12.31784	0.0000
UN--IPUN	-0.109834	0.051330	-2.139753	0.0337
MA--IPMA	0.014372	0.017551	0.818871	0.4139
OL--IPOL	0.279368	0.025581	10.92099	0.0000
AU--IPAU	0.430009	0.037579	11.44274	0.0000
PL--IPPL	-0.252582	0.068313	-3.697431	0.0003
PG--IPPG	0.121181	0.020796	5.827183	0.0000
RO--IPRO	-0.412996	0.087878	-4.699668	0.0000
SN--IPSN	0.214331	0.031010	6.911662	0.0000
SC--IPSC	-0.106869	0.056951	-1.876521	0.0621
FI--IPFI	0.224497	0.033424	6.716574	0.0000
SU--IPSU	0.295522	0.025769	11.46805	0.0000
MB--IPMB	0.268293	0.028646	9.365923	0.0000

Weighted Statistics

R-squared	0.999554	Mean dependent var	14.81814
Adjusted R-squared	0.999490	S.D. dependent var	12.41056
S.E. of regression	0.280282	Sum squared resid	14.76892
F-statistic	15605.32	Durbin-Watson stat	0.721504
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.879905	Mean dependent var	8.067867
Sum squared resid	16.90266	Durbin-Watson stat	0.438357

Results obtained using Eviews.

The overall validity of the estimated model is appropriate, R-squared having a very high value (close to one). More, as it happens usually with pool data models, Durbin-Watson test indicates some correlation in the residual variables, but, this not affects the overall quality of the estimation.

The obtained results show that, at a level of statistical significance of 10% the estimated independent variable coefficients have statistical relevance for all countries of the sample, excepting Czech Republic, Estonia, Latvia and Malta.

Having in mind that the sign of the independent variable coefficient highlight the nature of the link between the dependent variable and the independent variable, for 6 countries (all developing - former transition - countries (Bulgaria – BG, Lithuania – LI, Hungary – UN, Poland – PL, Romania - RO and Slovakia – SC), the obtained results show that between the gross fixed capital formation per capita and corporate income (profit) tax there is an inverse connection. Thus, a reduction of the level of corporate income (profit) taxation determines, in time, an increase in the level of gross fixed capital formation per capita. For all other 17 countries of the sample (all having a level of income per capita average and above average) the estimated coefficients are positive, so the connection between the two variables is a direct one. This result is at odds with the theoretical predictions and it could be explained by the fact that in high income countries, taxation ceased to be a major determinant of the investment, other factors playing a bigger role in the investment decision of the economic agent.

Conclusions

Focusing our study on EU member states, the estimated model showed that corporate income (profit) taxation has a negative impact for some developing – former transition countries, which is consistent with economic theory of investment. This result could be expected if one have in mind that at the beginning of the transition all these countries faced two divergent needs: on one hand, there was a pressing need to raise the level of private capital in the economy and, on the other hand, there was a need to establish a fiscal system able to generate sufficient revenues for public purposes.

An opposite result was obtained for average and above average income countries. For these countries, it seems that there is a direct connection between gross fixed capital formation and corporate income tax burden, which contradicts the theoretical predictions. In these countries, taxation ceased to be a major determinant of the investment, other factors playing a bigger role in the investment decision of the economic agent.

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