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TAX COMPETITION AND FOREIGN DIRECT INVESTMENTS. IS THERE A CONNECTION?

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Abstract

The issue of tax competition has fuelled a lot of interest and debates among theoreticians as well as practitioners during the last decades. The intense financial and labour flows due to globalisation has led to a "race to the bottom" tax competition among countries, some theoreticians considering it as beneficial others, on the contrary, blaming it as harmful competition, encouraging misallocation of resources. The paper endeavours to find out whether the tax competition has indeed a significant influence on the foreign direct investments flow, or other determinants are equally or more important in this process.

Key words: foreign direct investment, tax competition, statutory tax rates, effective tax rates
JEL classification: H20, P45

1. Theories of tax competition

The literature concerning the issue of tax competition could be classified into two main groups. The first one, beginning by Tiebout [Tiebout, 1956], assesses tax competition in a positive way because it leads to a more effective use of public funds and limits non- productive activities such as rent seeking. The second one, beginning by Oates [Oates, 1972], considers the tax competition as harmful because of the decline in tax collections and consequently to the decrease of provided public services below optimal welfare level. Oates argues that the result of tax competition could be a tendency towards a lower volume and efficiency of public services. If governments decrease taxes in order to attract mobile capital, public expenditures are below the level when the marginal benefits of these expenditures equal their marginal costs. The expenditure cuts concern especially projects that don't provide enough benefits to business environment. Oates's conclusion is that such government behaviour is not effective and is based on the presumption that no government gets a competitive advantage in this confrontation. The result is a decline of welfare throughout all the communities or countries. In addition, Sinn [Sinn, 1997] emphasises the characteristics of services provided by public sector and not efficiently provided by private sector. Competition amongst government leads to a decline of providing such ser-

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vices. Sim adds that tax competition doesn't have to lead to the under-dimension of public services but it has strong redistribution effects.

Following Oates's discussion of tax competition, it was not until the mid-1980s that economists began to build formal models based on his ideas. Zodrow and Mieszkowski [Zodrow and Mieszkowski, 1986] and Wilson [Wilson 1986] have derived in a formal way the dynamics and the consequences of tax competition in what are known today as the basic models of tax competition. In their models, tax competition for mobile tax bases will lead to a "race to the bottom" in tax rates and leave the competing jurisdictions with too little revenues to be able to provide public services at a socially-optimal level. This basic result has also led to the fundamental question whether capital taxation – and for what matters corporate taxation – can survive in the long-run. Wildasin [Wildasin, 1989] notes that the tendency towards an under-provision of public services attributable to tax competition can be offset with a subsidy to each of the local governments, provided by a higher level of government.

A rather different perspective is taken by the public choice literature. Brennan and Buchanan (1980) argue that tax competition improves welfare, because the size of government would be excessive in the absence of this competition. Edwards and Keen (1996) examine this view formally in various "Leviathan models," where governments are concerned in part with maximizing the size of the public sector. New considerations arise when regions differ in size. Bucovetsky (Bucovetsky [1991] and Wilson [Wilson, 1991] analyze "asymmetric tax competition" between a "large" region and a "small" region, as distinguished by the number of residents, each possessing the same endowments of capital and labour. Assuming that they are large enough to affect the after-tax rate of return to capital in the union, the larger jurisdictions tend to have higher equilibrium tax rates than the smaller jurisdictions, since the former are less concerned about tax-induced capital outflows. The resulting tax differentials cause an inefficient reallocation of capital from larger to smaller jurisdictions and thus potentially strengthen the case for tax harmonization. However, such differentials can also create political opposition to tax coordination, as small jurisdictions may benefit from the capital inflows (and higher service levels) attributable to tax competition. Over the last twenty years, economic research has attempted to remove the strict assumptions of the basic models of tax competition and has come with a more contrasted picture. The consequences of tax competition are indeed rather complex, do not necessarily lead to a "race to the bottom", they need to take into account the public expenditure side of the problem, and depend on various characteristics. The degree of (a)symmetry in the size of countries or the asymmetries in endowment of factors between jurisdictions will also influence the outcome of the tax competition.

The geographical location and the concentration production, such as the existence of a core-periphery model may lead to different optimal levels of taxation between regions. In addition, the existence of trade between the members of a union or with the rest of the world may lead to specialization and hence different equilibrium levels of taxation. The availability of multiple tax instruments besides capital taxation, the existence of economies of scale in the provision of the public service international spill over in public goods , the possibility for the public sector to provide public input goods that will reduce the private cost of production , or that will reduce income uncertainty via redistribution are also elements that will influence the effects of tax competition. The degree of mobility of the factor(s) of production, the complementarities between mobile and immobile factors a possible home bias in investment, the degree of citizens demand for so-

cial insurance, the presence of cross-border loss offset, and the possibility to export the tax burden on foreigners are further features that will determine the equilibrium effect of tax competition.

1.1. Statutory corporate tax rates and effective tax rates in foreign investments decision

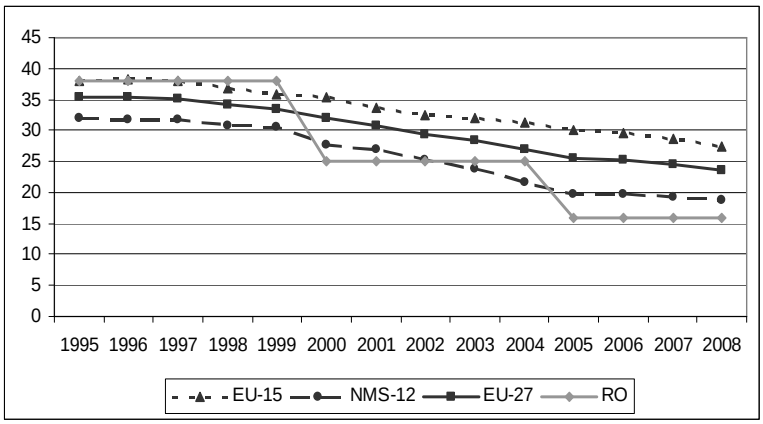
Though the statutory tax rate levied on corporate profits is the most visible attribute of the companies tax structure, actually it is but one of the many fiscal determinants that have a significant economic effect. The corporate statutory tax rate plays an important part in determining the tax stimulus influencing the location of companies abroad.

Consequently, the most adequate and reliable methods were sought after in order to summarise and sustain the above mentioned determinants and that could be influence investment decisions.

The statutory tax rates are the fundamental, primary and most common quantification of corporate income decided by legislative and governmental bodies influencing the location of foreign direct investments (FDI).

The level of the statutory tax rates is essential because it should be consistent with the collection of public funds and to sustain taxpayers' incentives toward consumption, saving and investments. Thus, a high level of taxation doesn't necessarily mean a higher volume on tax collection because other factors are also important in this process. From the point of view of the present paper, the level of the tax base is extremely important. In most countries the definition of corporate tax base is complex implying a wide range of laws and economically inclusive variables (allowances, deductibility for retirement funds, asset evaluation, etc.

Figure nr. 1 shows the evolution of statutory tax rates, comparatively in EU 15 and NMS12 during 1995-2008. It is obvious that during this interval the statutory tax rates were constantly diminished (In EU 15 the average statutory tax rate lowered from 38% to 27,5% while in NMS12 its level fell from 32% to 18,7%.



Source: Eurostat, authors'computation

Figure no.1. The evolution of corporate statutory tax rates in EU15, NMS12 and Romania, during 1995-2008

The statutory tax rate is one of the elements determining the tax contributions. By comparison, the regulations stating the rules to determine the tax base are even more impor-

tant because they provide the necessary tools to differentiate types of activities and taxable operations.

In order to reveal the actual effects of corporate taxation the statutory tax rates should be levied considering the real tax base. According to OECD [OECD 2002] to determine the corporate tax the gross profit should be adjusted with the deductions and allowances, asset depreciation, facilities, deferred payments, etc. By applying all these corrections, the effective tax rates can be determined. Nevertheless, the computation is quite complex, authors expressing divergent opinions concerning the methods involved.

The variety of tax regimes rose questions concerning the marginal and average average tax rates (Frenkel, Razin, & Sadka, 1991; Mendoza, Razin & Tesar, 1994). Moreover, considering the existing methodologies, the availability of date considerably limits the computation of marginal and average effective corporate taxation.

Studies concerning so called effective tax rates search for variables and adequate indices. In a quasi-unanimous approach an effective taxation rate measures the net sum of collected taxes levied on a certain economic activity and consistent with the rules defining the fiscal base and the statutory tax rate. By estimating the effective tax rates economists try to answer questions like: what is the average tax burden, how do net tax burdens differ from one activity to another, from one investment to another and from one tax payer to another, etc.).

The effective marginal tax rates (EMTR) are defined as the difference between the pre corporate taxation rates and the post corporate taxation rates. On the other hand, the average effective tax rates (EATR) is the ratio between the collected taxes and the pre tax profits. Different currents of opinion reveal the advantages and the disadvantages of each quantification method. Chen, Martinez-Vazquez and Wallace [Chen, Martinez-Vazquez and Wallace, 1998] and Slemrod [Slemrod, 2004] did not use the EMTR given the availability of data concerning the corporate fiscal regime in order to make the necessary comparisons preferring the EATR. On the other hand, Bird and Chen [Bird and Chen, 2002] sustain the superiority of EMTR compared to EATR saying that EMTR better serves to a comparative approach among different types of activities and sectors than EATR.

Nevertheless, the literature mentions several arguments against using the EMTR method. Firstly, though EMTR are easily determined at microeconomic level, at an macro or international level computations could be difficult and unpredictable. Secondly, the density and diversity of deductions, credits and allowances seem much to complex to determine the effective tax burden. Thirdly, the majority of available methods to determine EMTR need date concerning the distribution of income that should be consistent with social security contributions, taxation schemes, and tax returns. Fourthly, the date concerning the tax rates and tax systems are not consistent with the aggregate concepts concerning the macroeconomic model. Fifthly, the observable variables used to make estimations concerning the tax rate can be affected differently by similar taxes [Frenkel, Razin, & Sadka, 1991]. Sixthly, the tax systems, especially in decentralised systems include different forms of taxation affecting the same tax base. Seventhly, the EMTR does not estimate the rigorousness of a tax procedure. Last but not least, the EMTR determination is complicated by at international level given the differences between taxation systems and the barriers concerning the necessary data. [Esterly & Rebelo, 1993].

Despite the mentioned disadvantages, Bird and Chen [2002] are in favour of EMTR. Their arguments are the following:

- EMTR serves as better comparison indicator offering the proofs of a tax distortion as well as the advantages and disadvantages of a tax system compared to another;
- EMTR is considered as an *ex-ante* indicator, reflecting the foreseen impact of a formal tax structure;
- EMTR is considering not only the statutory tax rates but also other fiscal rules (allowances) that can affect the real taxation costs;
- EMTR is an economic concept assessing the impact of tax structures on capital costs;
- EMTR is sensitive to the formal tax structure and its interaction with the economic indicators being an ideal tool to stimulate investments.

Bird and Chen [Bird and Chen 2002] oppose the EATR arguing that this does not represent a relevant indicator when comparing different tax regime because EATR depends on the business performance of the tax payer and the quality of the tax administration reflecting the interaction between the economy, the official tax structure and the actual tax administration. Moreover, EATR quantifies the total or marginal tax burden for income differentials but are has not a strong economic foundation.

On the other hand, Slemrod and Shah [Slemrod and Shah, 1991] are in favour of EATR arguing that the in the effective average tax rates the legal aspects are better embedded. Moreover, Mendoza, Razin şi Tesar [Mendoza, Razin and Tesar, 1994] emphasise that the EATR approach is less restricted by the availability of data than EMTR that considers the net effect of the current norms concerning allowances, deductibility, deferred payments and is not consistent with the aggregate taxation rates at national and international level. Another approach is proposed by Devereux, Lockwood and Redoano [Devereux, Lockwood and Redoano, 2002]. Their method for determining EATR as well as EMTR is based on the application of effective corporate taxes to a hypothetical investment project.

Most of the methods presented in literature are not applicable to a large sample of countries thus these tax rates seem impossible to determine, are complex, and cannot be verified as long as each country has its own taxation doctrine and the less developed countries do net have reliable date sources.

These disadvantages can be surpassed by the Slemrod [Slemrod, 2004], Altshuler and Goodspeed [Altshuler şi Goodspeed, 2002] approach suggesting a method to determine EATR when a large sample of countries is used. Slemrod [Slemrod, 2004], and Altshuler and Goodspeed [Altshuler and Goodspeed, 2002] show that the EATR of a country can be determined by the ratio between the corporate tax rate and the GDP in order to be compatible for a large sample of countries. The limitation is that the GDP is not an aggregate measure of corporate income. Nevertheless the approach is simple includes important information concerning the corporate taxation, and foremost allows international comparisons.

Given the advantages and disadvantages of the two approaches in our paper we use the EATR method due to the availability of data for the 27 European member states.

a. The forward looking method

The anticipative quantification of the corporate effective tax rates is founded on the neoclassical investment theory, largely presented by Devereux.

$$EATR = \frac{NPTV}{NPV} = \frac{(\tau - A)(\rho + \delta) + \tau(p - \rho)}{p} \qquad (1)$$

Considering a corporation that invests 1 dollar in a real asset *NPTV* (net present value collected) is the net present value of the corporate collected taxes and *NPV* is the present value of pretax income. It is presumed that the depreciating allowance rate of the asset is δ *and* time is treated as a continuous variable ρ is the discount rate, p is the net rate of return before tax τ is the corporate statutory tax rate, A is the present value of the future of the future tax reduction due to all the deductibility associated to the investment. By simplifying the demonstration it is presumed that the only deduction and allowances are the depreciation allowances at a φ rate (that can differ from δ) at a decreasing base. Thus, the average effective tax rate measures the proportionate value of the project paid by taxation. When the taxable profit differs from the actual profit the EATR will differ from the statutory tax rate. The EATR can be computed for any value of the tax rate before taxing the profit p. A genuine interest is given to the collected taxes from the marginal investment project with a zero net value. Without taxes and depreciation the present value of income generated by a marginal investment project is $PVG = (p + \delta) / (\rho + \delta)$, meaning a marginal project that needs an initial investment cost of 1 dollar. $PVG - NPVT - 1 = 0$. Onward,

$$\bar{p} = \frac{(1-A)(\rho+\delta)}{1-\tau} - \delta \qquad (2)$$

when $p = \bar{p}$ an anticipative measure of the EATR is obtained:

$$EMTR^f = \frac{(\tau - A)(\rho+\delta)}{(1-\tau)\bar{p}} \qquad (.3)$$

A more familiar expression for the EMTR is

$$EMTR^f = \frac{\bar{p} - p}{\bar{p}} \qquad (4)$$

presuming that $EMTR^f$ is the difference between corporate pre tax and post tax measured against the pre tax corporate tax.

$$EATR^f = \left(\frac{\bar{p}}{p}\right) EMTR^f + \left(1 - \frac{\bar{p}}{p}\right)\tau \qquad (5)$$

For a marginal investment project p = $\bar{p}$, $EATR^f = EMTR^f$, but for projects with very high returns the EATR is almost equal to the statutory tax rate. When companies have a high rate of return they must choose between mutually exclusive projects, their decision being influenced by EATR and the EMTR.

b. The backward looking method

This method uses the data concerning the collected corporate income tax. By definition the corporate income before taxation pK, where K is the stock of capital and p is the rate of return before taxation. If the corporate tax paid in interval t is T_t, the backward looking effective average tax rate is:

$$EATR^b = \frac{T_t}{p_t K_t} \qquad (6)$$

$$T_t = [(\tau_t - A_t)(r+\delta) + \tau(p_t - r)]K_t \qquad (7)$$

$$EATR^b = [(\tau_t - A_t)(r+\delta) + \tau(p_t - r)]/p_t \qquad (8)$$

If $\rho = r$ and the discount rate equals the real interest rate, then $EATR^f = EATR^b$, and the backward looking EATR is the same as the forward looking one. In a stable fiscal environment the backward looking and the forward looking EATR are identical. Moreover, if the hypothesis of constant profits is added, so that $p_t = \overline{p}_t$, resulting $EATR^b = EATR^f$ implying that $EATR^b = EMTR^f$ given that $EATR^f = EMTR^f$ when $p = \overline{p}$. Thus, the backward looking EATR will equal the forward looking EMTR.

But when these restrictive hypotheses are not obeyed the three levels of effective tax rates will shift from one another. Particularly, the existence of pure profits $p > \overline{p}$, means that the backward looking EATR will shift from the forward looking EMTR that triggers the investment incentive The GSK method suggests an alternative measurement of the EMTR that can be estimated by using the data concerning the collected taxes. In this case, the level of the backward looking EMTR suggested by the GKS method is:

$$EMTR^b = \frac{(T-E)/K}{(T-E)/K + r(1-\tau)} \qquad (9)$$

where T represents the collected corporate taxes while E is the estimated collected taxes

Considering that

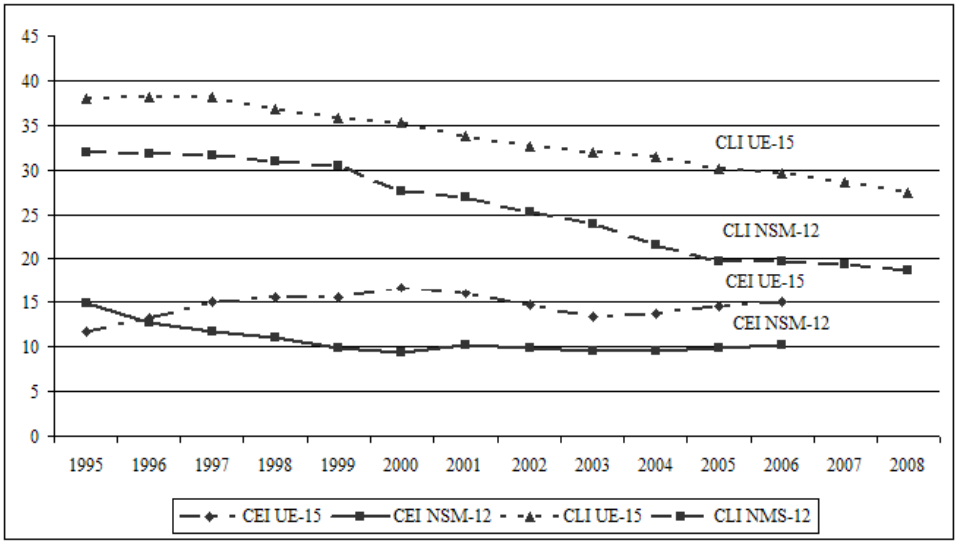
$$(T-E)/K = (\tau - A)(r+\delta) \qquad (10)$$

$$\overline{p} - r = \frac{(\tau - A)(r+\delta)}{1-\tau} \qquad (11)$$

The EMTR according to GKS results:

$$EMTR^f = \frac{\overline{p} - p}{\overline{p}} = \frac{(\tau - A)(r+\delta)}{(1-\tau)\overline{p}} = \frac{(T-E)/K}{(T-E)/K + r(1-\tau)} \qquad (12)$$

The result shows that the backward looking GKS EMTR equals the forward looking EMTR under stable tax legislation.



Source: Eurostat, authors'computation

Figure no. 2. The evolution of corporate statutory tax rates and effective tax rates in EU15, NMS12 during 1995-2008.

2. Evidence concerning the effects of tax competition on foreign direct investments

The subject of tax competition can be examined using the gravitational model according to which the bilateral flows among origin and host countries are reduced on the basis of FDI flows, gravitational variables and taxes.

The regression equation is the following:

$$\log(ISD_{ijt}) = \alpha + \beta_1(CLI_{ijt}) + \beta_2(CEI_{ijt}) + \beta_3\log(GDP_{jt}) + \beta_4\log(GDP_{it}) + \beta_5\log(DIST_{ij}) + \beta_6 FC_{ij} + \beta_7(CUFM_{ijt}) + \beta_8\log(CPI_{jt}) + \varepsilon_{ijt} \quad (13)$$

where FDI are the foreign direct investment flows among two countries (*i* country of origin, *j* host country) during a *t* interval[1] the distance between origin and host countries ($DIST_{ij}$), th mutual frontier FC_{ij}. The taxation variables are the statutory rates (CLI_{ijt}) and effective rates (CEI_{ijt}). The study covers 27 EU member states during 1996- 2006 annual time series expressed in millions of Euro: 2575 observations are positive, 678 are negative and 5170 are zero or unavailable.

The effects of the main traditional determinants on the FDI flows (location, market, etc.) and of the taxation variables are analyzed as follows:

$$\log(ISD_{ijt}) = \alpha + \beta_1 CLI_{ijt} + \beta_2 CEI_{ijt} + \beta_3\log(GDP_{jt}) + \beta_4\log(GDP_{it}) + \beta_5\log(DIST_{ij}) + \beta_6 FC_{ij}\ 4) \quad (14)$$

The result of the investigation is described in Table nr.1, showing that the effect is significantly negative though it is a representative determinant in gravitation models. It

suggests that the integration process in the EU is a continuous one, an important part of FDI consisting in re-exporting goods and services and the effects of taxation are clear enough. The statutory tax rates have a positive effect (though not significant enough), while the effective ones do not impact on FDI flows. Besides the fiscal stimulus package, the FDI flows could be encouraged, at least in the NMS by the low labour costs. Firms originating in countries with high wage should feel an incentive to invest in low cost labour countries. In addition, infrastructure public spending in host countries should be a positive signal in attracting FDIs, mainly in the NMS. The regression equation following:

$$\log(ISD_{ijt}) = \alpha + \beta_1 CLI_{ijt} + \beta_2 CEI_{ijt} + \beta_3 \log(GDP_{jt}) + \beta_4 \log(GDP_{it}) + \beta_5 \log(DIST_{ij}) + \beta_6 FC_{ij} + \beta_7 (CUFM_{ijt}) + \beta_8 \log(CPI_{jt}) + \varepsilon_{ijt} \quad (15)$$

The results are shown in Table nr.2, showing that the considered variables have a significant effect n FDI flows for the EU 27 member states. The GDP influence is a positive one even when cost variables are considered in the equation. Statutory tax rates have a positive impact in most cases, FDI flows being directed towards countries with lower statutory tax rates, while the impact of effective tax rates, though positively influencing the FDI, flows have a weaker influence. In addition, the labour costs positively influence FDI flows, countries with lower costs being attractive for FDIs. Likewise, countries with higher infrastructure public spending in the host country encourage FDI flows.

Table nr.1 Estimation of the dominant gravitational variables and of taxation on FDI flows

Dependent Variable: LOG(ISDIJT?)
Method: Pooled Least Squares
Date: 03/15/09 Time: 09:30
Sample: 1995 2006
Included observations: 12
Cross-sections included: 450
Total pool (unbalanced) observations: 2229
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.544644	0.669418	-9.776621	0.0000
CLIIJT?	0.501643	0.122176	4.105910	0.0000
CEIIJT?	-0.000275	0.036524	-0.007524	0.9940
LOG(GDPIT?)	0.864696	0.031566	27.39331	0.0000
LOG(GDPJT?)	0.724739	0.029335	24.70568	0.0000
LOG(DISTIJ?)	-1.365695	0.076661	-17.81465	0.0000
FCIJ?	-0.207428	0.136512	-1.519484	0.1288
R-squared	0.458714	Mean dependent var		4.274123
Adjusted R-squared	0.457252	S.D. dependent var		2.627942
S.E. of regression	1.936042	Akaike info criterion		4.162304
Sum squared resid	8328.630	Schwarz criterion		4.180233
Log likelihood	-4631.888	F-statistic		313.8397
Durbin-Watson stat	1.295213	Prob(F-statistic)		0.000000

2.1. Separating the effects among EU15 and NMS12 according to geographical location

Because the high heterogeneity among *NMS12* and *EU15* countries one can presume that determinants like tax rates and cost variables may differ significantly. In order to ana-

lyze this aspect the estimated coefficients are differentiated according to geographical location of host countries. The impact of taxation and labour costs on FDI flows is differentiated according to host country location (i.e. belong to the EU15 or NMS12 sample).. Therefore, the taxation variables and labour cost ones interact with a *dummy variable UEi* equaling 1 when the host country belongs to *EU15* sample and zero *(1-EUi)* when belongs to NMS12 sample. The taxation coefficient and the labour costs interact with *EUj* for *EU15* group and *1-EUj* for NMS12 describing the geographical location of the host country. The regression equation is:

$$\log(ISD_{ijt}) = \alpha + \beta_1 UE_j * CLI_{ijt} + \beta_2(1- UE_j) * CLI_{ijt} + \beta_3 UE_j * CEI_{ijt} + \beta_4(1- UE_j) * CEI_{ijt} + \beta_5 \log(GDP_{jt}) + \beta_6 \log(GDP_{it}) + \beta_7 \log(DIST_{ij}) + \beta_8 FC_{ij} + \beta_9(CUFM_{ijt}) * UE_j + \beta_{10}(CUFM_{ijt}) * (1-UE_j) + \beta_{11} \log(CPI_{jt}) + \varepsilon_{ijt} \quad (16)$$

The results are describes in Table nr.3. The estimated coefficients for the gravitation variables are resistant when *EUj* dummy interactive variables are included. In case of separating the effects on taxation variables and labour costs an asymmetric behaviour can be noticed for NMS12 countries as compared to the EU15 ones. When they become significant, the statutory taxation differentials affect FDIs flowing towards the EU15 countries (positive value), but not towards the NMS12 countries (negative value).

The asymmetry among NMS12 and EU12 countries is also noticed in computations concerning the labour cost differentials. Obviously, the labour costs in NMS12 countries (presumably smaller) have a positive and significant impact on the FDI towards these countries while rather smaller in EU15 countries. The investment public spending in the host country also encourages the FDI flows.

Table nr. 2 The effects of labour cost and infrastructure public spending

Dependent Variable: LOG(ISDIJT?)
Method: Pooled Least Squares
Date: 03/15/09 Time: 09:32
Sample: 1995 2006
Included observations: 12
Cross-sections included: 450
Total pool (unbalanced) observations: 2229
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.736694	0.831371	-9.305946	0.0000
CLIIJT?	0.458586	0.122447	3.745180	0.0002
CEIIJT?	0.024945	0.037292	0.668903	0.5036
LOG(GDPIT?)	0.859465	0.032415	26.51446	0.0000
LOG(GDPJT?)	0.783547	0.033371	23.47967	0.0000
CUFMIJT?	0.327655	0.394010	0.831592	0.4057
LOG(CPIJT?)	0.501276	0.119269	4.202905	0.0000
LOG(DISTIJ?)	-1.405745	0.077435	-18.15391	0.0000
FCIJ?	-0.218306	0.136183	-1.603031	0.1091

R-squared	0.463471	Mean dependent var	4.274123
Adjusted R-squared	0.461538	S.D. dependent var	2.627942
S.E. of regression	1.928384	Akaike info criterion	4.155271
Sum squared resid	8255.433	Schwarz criterion	4.178323
Log likelihood	-4622.049	F-statistic	239.7134
Durbin-Watson stat	1.305602	Prob(F-statistic)	0.000000

Table nr. 3 Separating the effects of among EU15 şi NSM12 according to the geographical location

Dependent Variable: LOG(ISDIJT?)
Method: Pooled Least Squares
Date: 03/15/09 Time: 09:35
Sample: 1995 2006
Included observations: 12
Cross-sections included: 450
Total pool (unbalanced) observations: 2229
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.673999	0.863082	-6.574115	0.0000
CLIIJT?*UE15J?	1.180729	0.160693	7.347730	0.0000
CLIIJT?*(1-UE15J?)	-0.039890	0.167338	-0.238380	0.8116
CEIIJT?*UE15J?	0.217280	0.060072	3.617002	0.0003
CEIIJT?*(1-UE15J?)	0.011573	0.049268	0.234897	0.8143
LOG(GDPIT?)	0.817484	0.032248	25.35026	0.0000
LOG(GDPJT?)	0.611718	0.040844	14.97701	0.0000
CUFMIJT?*UE15J?	0.196928	0.442190	0.445346	0.6561
CUFMIJT?*(1-UE15J?)	0.872012	0.396109	2.201444	0.0278
LOG(CPIJT?)	0.640395	0.117922	5.430683	0.0000
LOG(DISTIJ?)	-1.415113	0.076701	-18.44983	0.0000
FCIJ?	-0.273699	0.133916	-2.043816	0.0411

R-squared	0.486110	Mean dependent var	4.274123
Adjusted R-squared	0.483560	S.D. dependent var	2.627942
S.E. of regression	1.888538	Akaike info criterion	4.114852
Sum squared resid	7907.100	Schwarz criterion	4.145589
Log likelihood	-4574.003	F-statistic	190.6499
Durbin-Watson stat	1.319622	Prob(F-statistic)	0.000000

2.2. Separating the positive and negative effects of tax rates differentials

The previous estimation relied on the hypothesis of a symmetric positive and negative effect of tax rates differentials. But, actually the impact can be highly asymmetric, the main reason being the coexistence of different double taxation schemes in investing countries. In order to identify the existence of such asymmetries influencing the effects of taxation and of labour costs, dummy variables are considered to reveal the sign of the taxation differentials: POZ_{ijt} equals 1 when the taxation differential is positive (the country of origin has higher tax rates than the host one) and NEG_{ijt} ($NEG_{ijt} = 1 - POZ_{ijt}$) equals 1 when the tax differential is negative (the country of origin has lower tax rates than the host one). Next, the UE_j , variable is added to determine whether there is another asymmetry induced by the geographical situation of the host country, i.e. the separation of positive and negative effects on UE15 şi NSM12 host countries. In separating the positive and negative effects of statutory and effective tax rates, the following regression equation is used:

$$\log(ISD_{ijt}) = \alpha + \beta_1 POZ_{ijt} * CLI_{ijt} + \beta_2 NEG_{ijt} * CLI_{ijt} + \beta_3 POZ_{ijt} * CEI_{ijt} + \beta_4 NEG_{ijt} * CEI_{ijt} + \beta_5 \log(GDP_{jt}) + \beta_6 \log(GDP_{it}) + \beta_7 \log(DIST_{ij}) + \beta_8 FC_{ij} + \beta_9 (CUFM_{ijt}) + \beta_{10} \log(CPI_{jt}) + \varepsilon_{ijt} \quad (17)$$

The results shown in Table nr.4 reveal the fact that the investment flows are positively influenced towards countries with lower statutory rates compared to the countries of origin ($POZCLI_{ijt}$ has a positive value), and not at all influenced ($NEGCLI_{ij)}$ is negative) when the host country has high tax rates that the country of origine. When the variables are negative the investment flows are not influenced. Gravitation variables $GDPit$ and GDP_{jt} have positive signs and significant values, the labour costs themselves positively influencing the investments.

Table nr. 4 Separating the positive and negative effects of taxation differentials

Dependent Variable: LOG(ISDIJT?)
Method: Pooled Least Squares
Date: 03/17/09 Time: 00:22
Sample: 1995 2006
Included observations: 12
Cross-sections included: 450
Total pool (unbalanced) observations: 2229
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.201295	0.832396	-8.651281	0.0000
POZCLIIJT?*CLIIJT?	0.143486	0.113967	1.259006	0.2082
NEGCLIIJT?*CLIIJT?	-0.002831	0.194095	-0.014586	0.9884
POZCEIIJT?*CEIIJT?	-0.037172	0.040356	-0.921101	0.3571
NEGCEIIJT?*CEIIJT?	-0.559462	0.141353	-3.957915	0.0001
LOG(GDPIT?)	0.877948	0.032728	26.82572	0.0000
LOG(GDPJT?)	0.770109	0.034056	22.61330	0.0000

CUFMIJT?	0.338385	0.395619	0.855332	0.3925
LOG(CPIJT?)	0.550850	0.119769	4.599270	0.0000
LOG(DISTIJ?)	-1.404580	0.077277	-18.17586	0.0000
FCIJ?	-0.231846	0.135951	-1.705365	0.0883

R-squared	0.466516	Mean dependent var	4.274123
Adjusted R-squared	0.464111	S.D. dependent var	2.627942
S.E. of regression	1.923771	Akaike info criterion	4.151374
Sum squared resid	8208.582	Schwarz criterion	4.179549
Log likelihood	-4615.706	F-statistic	193.9575
Durbin-Watson stat	1.329413	Prob(F-statistic)	0.000000

In separating the positive and negative tax differential effects in UE15 ŞI NSM12 countries, the regression equation is the following:

$$\log(ISD_{ijt}) = \alpha + \beta_1 POZ_{ijt} * UE_j * CLI_{ijt} + \beta_2 POZ_{ijt} * (1\text{-}UE_j) * CLI_{ijt} + \beta_3 NEG_{ijt} * UE_j * CLI_{ijt} + \beta_4 NEG_{ijt} * (1\text{-}UE_j) * CLI_{ijt} + \beta_5 POZ_{ijt} * UE_j * CEI_{ijt} + \beta_6 POZ_{ijt} * (1\text{-}UE_j) * CEI_{ijt} + \beta_7 NEG_{ijt} * UE_j * CEI_{ijt} + \beta_8 NEG_{ijt} * (1\text{-}UE_j) * CEI_{ijt} + \beta_9 \log(GDP_{jt}) + \beta_{10} \log(GDP_{it}) + \beta_{11} \log(DIST_{ij}) + \beta_{12} FC_{ij} + \beta_{13}(CUFM_{ijt}) + \beta_{14} \log(CPI_{jt}) + \varepsilon_{ijt} \quad (18)$$

The results of the investigation are shown in table nr.5. The outcome concerning the statutory taxes remains significantly different from the effective rate ones. For the statutory rates, the positive tax differentials ($POZCLI_{ijt}$, is positive) – i.e. lower taxes in host countries – have a significant impact on the EU15 host countries. It should be noticed the interesting positive impact on FDI lows in EU 15 countries in case of negative differentials ($NEGCLI_{ijt}$, positive) – i.e. higher rates in host countries compared to the countries of origin. Our analysis show that in NSM12 countries FDI flows wouldn't have been influenced by the statutory tax rates. The effective taxation differentials ($POZCEI_{ijt}$, having a positive value) – i.e. lower taxes in the host country –are insignificant excepting the positive differentials of effective taxation within the EU15 sample positively correlated with the FDIs. It means that the tax breaks might have a small influence compared to other determinants of FDI flows that eventually explains the insignificant impact of effective tax rates on FDI flows in NMS12 countries. It is also possible that our analysis lacks sufficient data concerning the actual fiscal burden in these countries. The smaller labour costs in host countries have a positive value showing that these determinants are significant in attracting FDIs compared to the EU15 countries. The public spending on investments have a positive value meaning that they also encourage FDI flows towards host countries.

Table nr 5. The separation between the positive and the negative effects of taxation differentials according to geographical localisation

Dependent Variable: LOG(ISDIJT?)
Method: Pooled Least Squares
Date: 03/20/09 Time: 20:55
Sample: 1995 2006

Included observations: 12
Cross-sections included: 450
Total pool (unbalanced) observations: 2229
Cross sections without valid observations dropped

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.919511	0.868245	-5.666040	0.0000
POZCLIIJT?*CLIIJT?*UE15J?	0.707838	0.151844	4.661621	0.0000
POZCLIIJT?*CLIIJT?*(1-UE15J?)	-0.287614	0.158787	-1.811314	0.0702
NEGCLIIJT?*CLIIJT?*UE15J?	0.543827	0.244792	2.221588	0.0264
NEGCLIIJT?*CLIIJT?*(1-UE15J?)	-0.620845	0.317551	-1.955106	0.0507
POZCEIIJT?*CEIIJT?*UE15J?	0.122016	0.065487	1.863200	0.0626
POZCEIIJT?*CEIIJT?*(1-UE15J?)	-0.051865	0.052609	-0.985869	0.3243
NEGCEIIJT?*CEIIJT?*UE15J?	-0.456886	0.180932	-2.525188	0.0116
NEGCEIIJT?*CEIIJT?*(1-UE15J?)	-0.651973	0.230667	-2.826469	0.0047
LOG(GDPIT?)	0.836849	0.032810	25.50607	0.0000
LOG(GDPJT?)	0.591867	0.040929	14.46084	0.0000
CUFMIJT?*UE15J?	0.433693	0.457339	0.948296	0.3431
CUFMIJT?*(1-UE15J?)	0.787827	0.399579	1.971642	0.0488
LOG(CPIJT?)	0.705026	0.119333	5.908071	0.0000
LOG(DISTIJ?)	-1.433922	0.076668	-18.70304	0.0000
FCIJ?	-0.295979	0.133976	-2.209190	0.0273

R-squared	0.488208	Mean dependent var	4.274123
Adjusted R-squared	0.484739	S.D. dependent var	2.627942
S.E. of regression	1.886380	Akaike info criterion	4.114349
Sum squared resid	7874.806	Schwarz criterion	4.155331
Log likelihood	-4569.442	F-statistic	140.7350
Durbin-Watson stat	1.336710	Prob(F-statistic)	0.000000

3. Conclusions

At the beginning of the transition process, the Central and Eastern European countries engaged in a full speed capital account opening leading to intense FDI inflows. This process was accompanied by important reforms in the taxation area generally following a decrease of tax rates and the tax base broadening. This behaviour raised suspicions that these countries engaged in a race to the bottom process forcing other countries to lower their corporate tax rates.

Recent studies suggest that the gravitation equation represents a a critical tool to investigate the determinants of FDI flows. It also allows bilateral analyses encouraging considering the effects of the taxation stimulus packages on the investment location decisions. In our endeavour the bilateral flows among the 27 EU countries is explained by using the gravitational variables (the dimension of the investor, the market potential of the host

country, and the distance between countries having a mutual border. These are structural determinants on the FDI flows in the sense that their unconditional impact on the host region. In these circumstances the taxation appears as a determinant but of non uniform importance for the FDI flows.

When the standard gravitational effect is used the estimations show that the statutory tax rates are important determinants in attracting FDIs while the effective tax rates are not relevant in location decision. The EU27 sample is heterogeneous concerning the attraction determinants on FDI flows. Indeed, the authors show that the effects of taxation and of labour cost depend on the destination of the FDI flows (EU15 or NMS12). It is also shown how the labour costs impact positively on the FDI, the lower the labour costs the more intense FDI flows (the results are significant for the NMS12 countries). The tax differentials become important when the investor envisages locating the plant in EU15 countries. For the whole EU27 countries only the statutory tax rates impact when they are lower in host countries, while when separating the effects of taxation for the two groups this determinant is significant in the EU15 countries while for the NMS12 it is insignificant.

To conclude: "who is afraid of taxation"? At first sight the EU old member states are worried because the lowering of tax rates in the NMS. But, as reassurance, the lowering of tax rates do not significantly impact on the FDI flows in the NMS but only in the EU15 countries. Therefore the competition coming from the NMS is not harmful.

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[i] Only inflows are considered, while reivested profits were left out. Therefore about 8% of FDI flows observations were left out (679 observations out of 8428).