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Paper

Original Citation:

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by Christian Bellak*), Markus Leibrecht**) and Roman Römisch***)

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Abbreviations used:
ETR … Effective Tax Rate
EATR … Effective Average Tax Rate
DEATR … Domestic Effective Average Tax Rate
BEATR … Bilateral Effective Average Tax Rate
EMTR … Effective Marginal Tax Rate
BEMTR … Bilateral Effective Marginal Tax Rate

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1 This study has been prepared under FWF contract Nr. 1008, Sonderforschungsbereich “International Tax Coordination”, http://www2.wu-wien.ac.at/taxlaw/sfb/
   All remaining errors are our own.
Abstract

Company-taxation policies in the Central and East European New Member States (CEE-NMS) have been frequently characterised as tax-cutting strategies in order to attract Foreign Direct Investment (FDI). On the basis of a survey of six empirical studies a median value of the tax-rate elasticities of FDI of -0.22 in CEE-NMS and mediterranean periphery countries is derived. Yet, these tax-rate elasticities probably suffer from a sort of measurement error bias since these studies entirely rely on the host country Statutory tax rate as measure of tax burden. Building on a thorough criticism of FDI as a measure reflecting multinational activity and the Statutory tax rate as a reliable measure of the effective tax burden, 315 effective average bilateral tax rates (BEATR) are calculated for seven home countries and five CEE-NMS for the period 1996-2004, following the approach of Devereux and Griffith (1998). Since our empirical results show substantial differences in the variability of the host country Statutory tax rates and the BEATRs, it is contended that the latter should be used as explanatory variables in empirical studies.

JEL: F2, H00, H25, H77

Keywords: Corporate income taxation; Effective tax rate; Foreign Direct Investment; Multinational Enterprises.

1 Introduction

Recent company-taxation policies in the Central and East European New Member States (CEE-NMS) have been frequently characterised as tax-cutting strategies in order to attract Foreign Direct Investment (FDI; Dobrinsky, 2003; Jarass and Obermair, 2000). Such policies are usually based on predictions that the tax burden levied upon corporate profits will have a substantial influence on investment and location decisions of Multinational Companies (MNCs) in the CEE-NMS. So far only few studies deal with this topic and a regional focus of CEE-NMS empirically. Furthermore, it will be argued that these studies use invalid indicators of the corporate tax burden of the parent company levied upon the profits of its affiliates abroad. If this is true, the results of these studies do not provide reliable evidence on whether variations in the tax burden in the CEE-NMS are an appropriate measure to attract FDI.

2 "Tax burden" and “FDI” are used for short.
It remains an empirical question whether there is a correlation between the tax burden and FDI in the CEE-NMS. This question is usually answered via estimation of “tax-rate elasticities”, which in order to lead to reliable results must fulfill several prerequisites. These include adequate measures of MNC activity and a valid indicator of the tax burden levied on FDI in a host country as well as a theoretical framework on which the choice of explanatory variables included in an econometric specification rests.

The main purpose of this paper is to discuss the choice of appropriate FDI data and the choice of an appropriate measure of the tax burden levied upon FDI in studies estimating the determinants of the location choice of MNCs. The paper is structured as follows. First, the results of earlier studies on the value of econometrically estimated tax-rate elasticities are briefly reviewed, thereby separating evidence on CEE-NMS and “periphery countries” from evidence on “core countries”. Second, it is discussed which indicators of tax burden should be used as well as disadvantages of using FDI-flow data as an indicator of MNC activity. Third, a description and an empirical analysis of the theoretical measures of the tax burden is provided, which are thought to be a reliable indicator for the tax burden levied upon FDI of seven home countries in the CEE-NMS (i.e., Slovenia (SI), Hungary (HU), Poland (PL), Czech Republic (CZ) and the Slovak Republic (SK)). These host countries have been selected, since they became members of the EU recently and thus, their tax policies may provoke (and partly have already provoked) reactions by incumbent EU member states even more directly than in the past. The seven home countries are at average the largest investors in these countries, ranked by their shares of FDI stocks.4

2 Survey of empirical studies: Does tax policy work to attract FDI?

The paper focuses on tax-rate elasticities explicitly or implicitly provided by several empirical studies. The studies are grouped into those which deal with FDI flowing mainly within the group of developed or “core” countries (homogenous group) and

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3 These are defined as the percentage change in FDI following a percentage point change in some measure of the tax burden. (DeMooij and Ederveen 2001; Appendix).
4 On average these countries are among the most important investors in all of the host countries considered. Other countries like Switzerland and Belgium are important for single host countries, only (see OECD 2004 and Bank of Slovenia for Details).
those which exclusively analyse FDI originating in developed countries and directed to countries with a relatively lower level of development, like the CEE-NMS and periphery countries (heterogeneous group). The separation of these two country groups is based on the idea that motives for FDI directed into the two groups of countries may differ, FDI could react differently to changes in the tax rate, since tax costs are part of total production costs. Thus, if cost and efficiency-related motives are predominant, FDI in “core-periphery” pairs of countries should be rather responsive to changes in tax rates. Since empirical results suggest a dominance of market-related motives for FDI in both country groups and thus a low share of purely efficiency-related FDI, we do not expect significant differences in tax-rate elasticities. However, apart from the motivation, there are a number of other determining factors, which might lead to differences in tax-rate elasticities between these country groups, which are now discussed.\(^5\)

2.1 FDI within core countries (“homogenous group”)

Concerning homogenous countries we rely upon the detailed meta-analysis of 25 empirical studies carried out by DeMooij and Ederveen (2001, 2003). Their findings suggest a median value of the tax-rate elasticity -3.3 (excluding extreme values).\(^6\) That is, a 1 percentage point reduction in the host-country tax rate raises FDI in that country by 3.3 percent. In order to compare different empirical studies, the reported results have been standardized (see section 2.3. below for the various definitions of elasticities and how they are inter-related). The authors note, however, a large variability by type of FDI, by source of finance, by sector, by year etc. A result, which is of particular relevance for our study is, that “FDI seems more responsive to effective or average tax rates than to Statutory tax rates” (ibidem, 2003, p. 690). Since the publication of DeMooij’s and Ederveen’s paper, several important studies, which are listed in column three of table 1 (see below), have been published. Since our focus here is on CEE-NMS, these studies are not reviewed here in greater detail.

\(^5\) We do not consider methodological factors here.  
\(^6\) An extreme value is defined as a value which lies more than 2 standard deviations from the mean value (DeMooij and Ederveen 2001).
2.2 FDI from core to periphery countries ("heterogeneous group")
Empirical evidence for CEE-NMS is still very limited, which is partly due to a lack of data and which stands in contrast to public debates, both in incumbent EU member states and CEE-NMS. For a number of reasons, listed below, CEE-NMS differ from other OECD countries or incumbent EU countries and it will be argued that these differences may be conducive to the fact that CEE-NMS are more likely to use company taxation as an instrument to attract foreign investment:

- The share of efficiency FDI
Following a number of surveys (Lankes and Venables, 1996; Altzinger, 1998 on Austrian FDI; Lankes and Wes, 2001; for an overview see Szanyi, 1999) on the motives for manufacturing FDI in the CEE-NMS foreign investment enterprises *grosso modo* can be separated into re-export-oriented and market-oriented companies. According to this division the most important motives for FDI were low production costs in the CEE-NMS on the one hand and gaining market access (to the host market or to the CEE-NMS region in total) on the other hand. Up to 1996, these surveys indicate that approximately two thirds to three fourth of manufacturing FDI have been market-oriented. Given that returns for host-market related FDI will diminish the more non-export-oriented companies are established in the CEE-NMS it appears likely that the share of efficiency-oriented FDI in terms of enterprises will rise in the future. Since taxes directly impact on the costs of production, it is conceivable that efficiency-oriented FDI are more responsive to tax changes than market-oriented FDI. Consequently, the probability that CEE-NMS countries *inter alia* use corporate taxation as an instrument to attract FDI will also increase.

- The share of greenfield FDI in total FDI
There are two main channels of FDI in the CEE-NMS; either through mergers and acquisitions (M&A) of existing firms (including privatization) or through establishing a new firm (greenfield investment). According to Lankes and Wes (1999) the proportion of greenfield FDI to M&A is approximately 50 percent if the number of manufacturing investment projects is considered. Yet, the proportion of greenfield FDI to total FDI is considerably lower in terms of the actual amount of FDI or in employment terms – approximately 25 to 33 percent according to several authors (Lankes and Wes, 2001,
Greenfield FDI is expected to be more responsive to tax rate changes than acquisitions, where the location of the target object is given. Since, a major part of M&As in the CEE-NMS was due to privatization and the number of privatization objects decreases over time, the proportion of greenfield FDI will increase. Because greenfield FDI are expected to be more responsive to tax rate changes than acquisitions, this will raise the importance of corporate taxation as a location factor.

- Maturity of FDI

The profitability of affiliates in CEE-NMS is related to their age. For example, Dell’mour (2003) reports for Austrian FDI in the CEE-NMS that “the profitability of affiliates which existed for five or more years is significantly higher (7.3% median value) than for younger affiliates (2.7%)” (translated by authors; see also Altzinger 2003). Since FDI in today’s CEE-NMS generally were not possible before 1989, the foreign affiliates are mostly young firms. The increase of the profitability over time might lead to a change in the financing of the affiliate abroad. The parent company might increasingly rely on reinvested profits rather than on own capital transfers and thus through the interaction of home and host country legislation, taxation becomes a more prominent location factor.

- Small-country property

With respect to tax policy, the probability that small countries engage in tax competition is higher than for larger countries. This argument is based upon theoretical considerations by Bucovetsky and Wilson (1991) and Wilson (1999), who find that small countries engaging in tax competition might receive net welfare gains from lowering taxes. Related to this Krogstrup (2003) argues that larger countries are less sensitive to tax competition as their agglomeration advantages allow them to set higher taxes than smaller countries. These arguments suggest that the CEE-NMS might find it beneficial to lower their tax rates further, since with the exception of Poland the CEE-NMS are small to medium-sized countries.

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7 It should be mentioned, however, that the distinction between greenfield FDI and M&A is somewhat artificial, as the latter do not differ from the former in many cases, if the acquired firm has been totally restructured. Please note that the relevance of this distinction for the location choice remains unaffected.
• Strong preference of CEE-NMS for FDI

With the start of transition the inflow of FDI was considered to be one of the main vehicles to accelerate economic development in the CEE-NMS. Besides compensating for the lack of domestic investment, the role of FDI was to facilitate restructuring via transferring technology and know-how, removing inefficiencies etc. Though the restructuring aspects might have lost importance over the years, the possibility that FDI generate employment and growth still induces a high preference for foreign capital in CEE-NMS. This might have become even more important, through the recent EU-accession, because of a facilitated access to the Common Market and an induced growth of political stability. The high preference for FDI makes CEE-NMS’ governments especially prone to tax cuts as a means to attract FDI.

A priori we therefore expect tax-rate elasticities to be larger in absolute value in CEE-NMS compared to those of OECD countries. Yet, there also exist several arguments against the existence of a close correlation between taxes and FDI (based on Büttner, 2001). Since the mobility of firms is limited, few re-locations or shifts of profits to low tax countries should occur in the short term due to tax (rate) changes. Therefore, quick success of tax-lowering strategies is not to be expected. A (debated) indication is the fact that despite generally lower tax rates, corporate tax income as percentage of GDP has risen in European countries on average. Building on the meta-analysis by deMooij and Ederveen (2003) reported above, we add and review the following papers\(^8\) (cf. Table 1, col. 1 and 2):

Table 1 Recent Studies on Taxation and FDI, by country group

<table>
<thead>
<tr>
<th>Eastern Europe</th>
<th>Periphery Countries</th>
<th>Core countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Javorcik (2004)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: “Recent” studies are defined in terms of either having been published after deMooij and Ederveen (2003) or have not been included in that study.

\(^8\) Here, only the results for the CEE-NMS and periphery countries are reported.
This requires the standardization of three different types of elasticities reported in empirical studies (see deMooij and Ederveen 2001, Appendix):

\[ \varepsilon = \frac{\partial \ln K}{\partial \ln t}, \text{ the tax elasticity} \]

\[ \varepsilon_s = \frac{\partial \ln K}{\partial t}, \text{ the tax-rate elasticity or semi-elasticity} \]

\[ \varepsilon_a = -\frac{\partial \ln K}{\partial (1-t)}, \text{ the elasticity of the after-tax rate of return} \]

\[ \varepsilon_s = \frac{\varepsilon}{t} = -\frac{\varepsilon_a}{(1-t)}, \text{ describes how these elasticities are inter-related.} \]

\[ K \ldots \text{measure of foreign capital} \]

\[ t \ldots \text{tax on K in the foreign country} \]

As some of the studies mentioned in Table 1, cols. 1 and 2 used a specification in levels, the following transformation was made:

\[ K = a + b^* \text{tax} \]

The \( b \)-coefficient was transformed into a semi-elasticity by \( (100^*b)/K \) where \( K \) was evaluated at its sample mean value, which is either directly provided in the studies or is derived from the information provided there.

On the basis of these six empirical studies\(^9\) a tax-rate elasticity of -0.22 (median value, semi-elasticity) was derived. Clearly, this tax-rate elasticity w.r.t. FDI is smaller in absolute terms in CEE-NMS than in the core countries, reported in subsection 3.1, which does not meet our expectations. However, these results are questioned for several reasons:

\(^9\) Several other studies on location choice of MNCs in CEE-NMS (see, e.g. Janicky and Wunnava, 2004) and on taxation in CEE-NMS have been published recently (see, e.g. Dobrinsky, 2003), yet these studies do not combine the aspects of taxation and FDI, which is a serious shortcoming, if location choice is to be explained.
- methodological shortcomings of the surveyed studies, especially an omitted variable bias as only few studies base their choice of right-hand side variables explicitly on economic theory (notably Carstensen and Toubal, 2004)\textsuperscript{10}
- the definition of MNC activity as a capital flow (i.e. FDI flow) and
- the lack of a suitable measure of the tax burden.

In this paper we concentrate on the last two issues in section 2.3.

2.3 Some critical points
This section discusses three features which are of particular importance in deriving tax-rate elasticities: first, how to measure company tax burden appropriately (2.3.1.), second, how to measure MNC activity (2.3.2.) and third, to what extent these two points are interrelated (2.3.2).

2.3.1 The measurement of company tax burden as a determinant of the location choice of MNCs
Which measures of tax burden should be used in empirical analysis as a determinant of location decisions of MNCs? In order to answer this question, it is split into two sub-questions:

(i) Which measures of tax burden are available in general?
Apart from the Statutory tax rates, the measures of tax burden may be split into backward-looking and forward-looking tax rates (cf. Figure 1 and the references mentioned there). While both have advantages and disadvantages, clearly the choice of the measure of tax burden should be guided by the underlying research question, in our case the choice of a foreign location by an MNC. On the one hand, backward-looking tax rates are inappropriate, since profits from national and international activities cannot be disentangled and backward-looking rates can be seriously flawed due to data problems. Notably, National Accounts Data do not provide reliable data

\textsuperscript{10} Other methodological shortcomings in one or more of these studies include: static panel data models instead of dynamic models (again, omitted variable bias) and endogenity between the endogenous variable and the measure of tax burden used (simultaneity bias).
on corporate profits. Advantages of backward-looking tax rates are that there are easily calculated from real data and include tax planning activities of MNCs.

On the other hand, forward-looking effective tax rates (ETRs) focus on hypothetical (“future”) investments and inter alia carry three conceptual advantages, which are of relevance for location decisions: (i) They distinguish between domestic and international investments (domestic vs. bilateral rates). (ii) They are calculated as either effective average tax rates (EATRs), measuring the tax burden of an infra-marginal (i.e. profitable) investment or as effective marginal tax rates (EMTRs), measuring the tax burden of an investment which just covers the cost of capital. (iii) They reflect the location decision of an MNC, which is, of course, also “forward-looking”. Disadvantages are the relatively high degree of complexity in the calculation of these rates – the net present value of a hypothetical investment has to be calculated with and without taxation – and the fact that tax planning activities of MNCs cannot be addressed with those rates.\(^\text{11}\)

Figure 1 Measures of tax burden

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\(^{11}\) For a detailed description of advantages and disadvantages of these rates consult inter alia OECD (2000) or Leibrecht and Römisch (2002).
(ii) Which measures of tax burden are appropriate, if location decisions are to be explained?

In order to answer the second question, we start from a description of the location decision by an MNC, following Devereux and Griffith (2003; 2002; and 1998). According to Devereux and Griffith as well as the established literature on MNCs, the location decision should be split into three levels:

- “Level 1” is concerned with the discrimination between different types of market servicing, most importantly whether to produce at home or abroad.\(^\text{12}\)
- “Level 2” includes the decision where to locate, given that level 1 resulted in the decision to invest abroad (i.e. FDI). Level 2 thus comprises discrete investment decisions (all-or-nothing, Mutti and Grubert, 2004, p. 342).
- “Level 3”: Either when entering a new market or when production is already in place adjustment decisions are taken, i.e. expansion or downscaling of an existing investment abroad.

Figure 2 includes the three different decision levels described related to the location choice of an MNC:

<table>
<thead>
<tr>
<th>MNC decision</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Domestic or Abroad</td>
</tr>
<tr>
<td>Level 2</td>
<td>Where?</td>
</tr>
<tr>
<td>Level 3</td>
<td>How much?</td>
</tr>
</tbody>
</table>

Source: Based on Devereux and Griffith (2002), p. 87

The two forward looking ETRs mentioned under (i) above are now directly related to level 2 decisions and level 3 decisions in the following way: EATRs are related to the decision where to locate (level 2), ranking the investment according to the profitability

\(^{12}\) Here, we are not concerned with the choice between FDI and other types of foreign market servicing, since our dependent variable is some measure of FDI or the activity of an MNC in a host country. Thus, we take the MNC as given. Needless to mention, the first decision level in Figure 2 below is explained by the OLI paradigm.
in different locations. EMTRs explain the optimal scaling of a new or existing investment (level 3), “conditional on the choice of location” (Devereux and Griffith, 2003, p. 108).

The conclusions from the foregoing discussion for the analysis of location decision of MNCs and taxation are:

- From a conceptual point of view ETRs are superior to Statutory tax rates as indicators of tax burden.
- When dealing with FDI ETRs need to be derived on a bilateral level with respect to international location decisions.
- For an analysis of location decisions of MNCs BEATRs are suggested.
- EATRs and EMTRs should be used in empirical studies, if the dependent variable is a measure of aggregate FDI flows.

The last conclusion merits a short explanation: Ideally, one would need data on “level 2” decisions and on “level 3” decisions. However, in most cases only aggregate FDI data (see subsection 2.3.2. below) are available. These data typically do not allow a separation of FDI into new FDI and expansionary FDI. Therefore, aggregate FDI measures should be related to both, average and marginal tax rates, the former explaining new FDI (where to locate) and the latter explaining expansionary FDI (the scaling of the investment) (Devereux and Griffith, 1998, p. 344). Yet, virtually all studies reviewed above, use only one single measure of tax burden, despite the fact that almost all of these studies use aggregate FDI data. Most studies do not even comment on the suitability of the Statutory tax rate or argue that Statutory tax rates and average tax rates behave similar empirically (e.g., Javorcik 2004).

In subsection 3 below it will be shown that using the Statutory tax rate is likely to result in biased estimates of tax-rate elasticities. This is simply done by comparing the level and variability of BEATRs with that of the Statutory tax rates.

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13 From an empirical point of view, this problem of non-separability of certain types of FDI data is mitigated by the fact that the semi-elasticities do not differ significantly between studies separating or not these two types of FDI, as mentioned by DeMooij and Ederveen (2001, p. 32).

14 Since we are concerned with location decisions in this paper, we do not show EMTRs, which we have calculated for the same range of countries and period, yet which refer to “level 3” decisions. But one should be aware that studies which use aggregate FDI flows or stocks as the dependent variable have to use both effective rates as regressors from a conceptual point of view. Otherwise the results may suffer from omitted variable bias.
2.3.2 The measurement of MNC activity

Despite there are several official and internationally agreed definitions of FDI, the choice of the appropriate indicator in empirical research is a difficult task and no commonly agreed FDI-measure exists (e.g. Bellak 1998, 1999). With respect to location choice, the quality of FDI flow data has been compared to various other measures of multinational activity. Here, the advantages and disadvantages of several commonly used measures are discussed briefly. (see Boxes 1 and 2; cf. also Devereux and Griffith 2002, p. 84f.)

Location choices of MNCs have to be operationalised in order to be used as the dependent variable in empirical studies. This boils down to the question whether FDI data obtained from international databases like UNCTAD, EUROSTAT or OECD are sufficient to reflect location decisions (see Box 1) and thus should be correlated with tax variables. This question is important, since such data have been used in many empirical studies on taxation and FDI for the simple reason of data availability. While these measures have the advantage of covering a broad range of countries and time, however, a majority of authors in this field emphasizes the necessity to measure the real activities of MNCs in the host country, rather than the financial side of FDI. These aspects are reflected in the credit (assets) and debit (financing) side of the balance sheet of a company as well as in the share of cross-border flows of capital in total capital invested in the host country. It is concluded that ideally several measures should be used and that FDI capital data should be interpreted with caution.

Box 1. FDI Measures used in the Literature on Taxation and FDI

FDI data comprise flow measures as well as stock measures. The latter are either built from accumulated flows taken from the annual balance of payments (Eurostat 2003), in which case the annual differences in stocks (i.e. FDI position data; e.g. Gorter and Parikh, 2003, p. 197) equals the flows; or they reflect book-values, in which case the annual flows from the balance of payments may be larger or smaller than differences in annual stocks. This is due to valuation issues and the share of

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15 Gorter and Parikh, 2003, p. 197, report that Eurostat constructs end of period positions and adjusts this information by correcting for inflation, exchange rate changes as well as for the revaluation of the assets and liabilities. An end of period position should thus represent the market value of the capital stock at current prices at exchange rates.
locally raised funds, which are not included in the Balance of Payments definition of FDI issued by the IMF manual.

**FDI flows**

... may reflect only net cross-border capital flows between parent company and the subsidiary and thus exclude reinvested earnings (a problem which was particularly relevant for several Central- and East European countries during the early years of transition).

... may include reinvested earnings of the affiliate, which, by definition, do not cross borders, but constitute an important share of capital invested in many cases (Bellak, 1998). For an insightful report, see the Hungarian National Bank (2004).

**FDI stocks**

... are ideally measured in book values, originating from company accounts. They are closer to measures of real activities than FDI flows as they measure the capital stock which by definition in the simplified balance sheet includes real and financial assets. FDI stock data suffer, however, from the valuation at historical values, which "can be especially misleading when there has been significant inflation in some countries but not in others." (Mutti, 2003) Yet, FDI stock data carry the advantage that local borrowing in the host country is included.

Note: For a more detailed discussion and the empirical relevance of the valuation problem, see Cantwell and Bellak (1998); and Bellak and Cantwell (2004).

**Box 2. Measures thought to reflect real activities of MNCs more appropriately**

**Plant, property and equipment (PPE):** These are referred to as “fixed assets”. In other words, they are a firm’s real estate, buildings, machines, factories etc. and consist of physical assets. They are carried in the balance sheet at cost, regardless of their actual value, which is the main critique to the use of PPE as reflecting the real activities of MNCs. Even if intangible assets are also carried in the balance sheet, they should be excluded as measures of real activities, since their valuation is largely meaningless. (Rather, the profit and loss account (income statement) gives an insight into the “real” value of intangibles.)

Differently from FDI stocks (see Box 1), which reflect book values of *ownership claims* of controlling foreign investors (debit side of balance sheet) and thus exclude equity supplied by host country investors, PPE reflect book values of *real productive assets*. As Hines (1996b, p. 11) states: “PPE probably more closely corresponds to capital that enters production functions.” PPEs thus exclude those components of FDI, which are financial investments. The advantage, therefore, is to exclude differences in the behaviour of real and financial assets (e.g. degree of volatility),
which are well known from studies comparing portfolio investment vs. FDI. However, these measures suffer from three disadvantages, related to the valuation of capital stock, i.e. exchange rate fluctuations, inflation and the exclusion of intangible assets.

**Gross product of affiliates** (GPO): This measure is available almost exclusively for the US (although other countries, like Germany, have similar data on sales of affiliates). Gross product is derived from financial and operating data. GPO measures the value of goods and services produced by MNCs. The measure thus differs from "sales", because sales include the inputs that the company purchases from outsiders as well as what it produces itself. Sales therefore have a drawback, since they may lead to overestimations of the real activity of MNCs in the host country. On the other hand, the drawback of GPO as reported in the BEA (Bureau of Economic Analysis) statistics is that it does not allow inclusion of industry detail or different types of affiliate ownership.

**Number of affiliates** (NOA): For several countries, the number of newly established affiliates annually is available. The use of count data has several methodological implications for empirical analysis. The main advantage of this measure is that it addresses the issue of firm location more directly than investment flow studies. (Beaulieu et al., 2004, p. 7) Also, new foreign firms may also be related to the entrepreneurial activity in the host country on the whole. A certain drawback is that this measure excludes expansionary investment, yet the question is whether location choice for new investments and location choice for expansionary investments can be expected to follow the same logic. But the exclusion of expansionary investments implies, too, that there is only one measure of tax burden necessary, namely the BEATR (see point 2.4.1 (ii)).

The discussion shows that from a conceptual point of view PPE data represent real multinational activity best. Due to data restrictions many studies rely upon FDI flows or stocks. But also these variables may (partly) not be available for a range of countries. One way to overcome the lack of data in this respect is to use mirror statistics, i.e. the outward FDI originating in the home country, if outward FDI is classified by host countries. But one has to be aware that there exist substantial differences between data reported by home and host countries.
3 Effective average tax rates in CEE-NMS

In this section it is shown that the critical points raised above are likely to result in biased estimates. This is done through a comparison of the variability of the Statutory tax rate and that of the conceptually superior ETRs.

The variability of the tax rates is considered here, because it matters in an econometric estimation, rather than the absolute value of the regressor. Our prior is that replacing the conceptually appropriate effective tax rates by the Statutory Tax rate, which is easily available, is only justified, if the variability in the Statutory tax rates is not statistically different from that of the BEATR.

We calculated forward-looking ETRs based upon the Devereux and Griffith methodology as no such data have been available so far concerning the CEE-NMS. This amounts to 423 single effective tax rates (domestic and bilateral) for seven home and five host countries for the time period 1996 to 2004.

3.1 Assumptions
Following Devereux and Griffith (1998 and 2003)\textsuperscript{16} we do not consider personal income taxes as for MNCs the majority shareholder\textsuperscript{17} is not known and/or she may not have the majority vote amongst shareholders and, more importantly, because we do not believe that for the managers of the MNCs the personal income tax position of the shareholders is an important factor for location decisions. We also exclude any other fiscal or non-fiscal incentives which might be provided to MNCs. In line with other studies (e.g. Yoo 2003; Devereux and Griffith 2003), the assumptions and parameters used in our calculation of ETRs are the following:

- 3 types of assets (machinery, building and inventory in the manufacturing sector)

\textsuperscript{16} The model allows deriving effective tax rates for an average firm. Two limitations should be emphasized: First, effective tax rates are derived upon a fixed pre-tax profitability (see below) and second, profits are assumed to be equal in each location. Despite both limitations are clearly not given \textit{in praxi}, the advantage is to better isolate the effects of changes in effective tax rates (ceteris paribus).

\textsuperscript{17} This is the person who determines the return required on each asset. Her personal sphere needs to be considered in the calculation of “shareholder-level-EATRs” (see Devereux 2003).
3 ways of financing a hypothetical domestic investment of 1 with a pre-tax financial return of 20%: retained earnings, new equity and debt

7 ways of financing a cross border investment of 1 with a pre-tax financial return of 20%\(^{18}\): (i) retained earnings subsidiary; (ii) new equity subsidiary and retained earnings parent; (iii) debt subsidiary and retained earnings parent; (iv) new equity subsidiary and new equity parent; (v) debt subsidiary and debt parent; (vi) new equity subsidiary and debt parent; (vii) debt subsidiary and new equity parent.

economic depreciation rates of the various assets: 3.61% for buildings, 12.25% for machinery, 0% for inventory

nominal interest rate of 7.625%

common inflation rate of 2.5%

constant nominal exchange rate

a weighted average structure of assets (buildings / machinery / inventory) of 55% / 35% / 10%

a weighted average structure across the various types of financing (retained earnings / equity / debt): 55 / 10 / 35 for parent and 1/3 / 1/3 / 1/3 for subsidiary.

Our assumptions about the asset structure differ from those of other studies, which mainly follow OECD (1991), because data on inventories in the CEE-NMS show that they are far less important than within the OECD in 1991. In particular, we assign a higher weight to investment in buildings.\(^{19}\)

3.2 Data description and analysis

3.2.1 Statutory tax rates and domestic effective average tax rates

We start from a simple comparison of Statutory tax rates and domestic effective average rates (DEATRs). The “overall” Statutory corporate tax rates (that is including local and central government profit taxes) reported in table 2 suggest that all host

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\(^{18}\) In the appendix we show how the bilateral effective tax rates depend on this assumption.

\(^{19}\) For explanatory notes about other assumptions please consult the respective studies directly.
countries but Slovenia face a fall in the overall Statutory corporate tax rate over the period under consideration. In Slovenia the rate remained constant. With respect to the home countries only Germany and Italy see a remarkable fall in the Statutory corporate tax rate. These two countries show by far the highest Statutory corporate tax rate in 1996. Furthermore, while in 1996 three host countries had higher Statutory corporate tax rates than the average rate of 37.6 percent, all of them have below average rates (average of 29.6 percent) in 2004. The largest drop occurred in Slovakia and Poland within host countries and Germany within home countries, respectively. No changes in the overall Statutory corporate tax rate occurred in Austria, the US and as mentioned in Slovenia.

<table>
<thead>
<tr>
<th>Year</th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
<th>SI</th>
<th>AUT</th>
<th>FR</th>
<th>GER</th>
<th>NL</th>
<th>UK</th>
<th>US</th>
<th>IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
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<td>40.00</td>
<td>40.00</td>
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<td>34.00</td>
<td>36.70</td>
<td>57.40</td>
<td>35.00</td>
<td>33.00</td>
<td>40.00</td>
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<td>31.00</td>
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<td>19.40</td>
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<td>31.00</td>
<td>40.00</td>
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<td>2001</td>
<td>31.00</td>
<td>19.64</td>
<td>28.00</td>
<td>29.00</td>
<td>25.00</td>
<td>34.00</td>
<td>35.30</td>
<td>38.67</td>
<td>35.00</td>
<td>31.00</td>
<td>40.00</td>
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<td>17.66</td>
<td>19.00</td>
<td>19.00</td>
<td>25.00</td>
<td>34.00</td>
<td>34.30</td>
<td>36.67</td>
<td>34.50</td>
<td>30.00</td>
<td>40.00</td>
<td>37.25</td>
</tr>
</tbody>
</table>

Turning to DEATRs, that is ETRs which cover the host country tax code (Statutory corporate tax rates as well as allowances), one observes a similar development as for the overall Statutory corporate tax rate. The DEATR fell in almost all countries. In the US there was no change due to a constant overall Statutory corporate tax rate and constant allowances. In Austria and Slovenia there was a slight increase due to a change in allowances combined with a constant overall Statutory corporate tax rate. One may conclude that the development of the DEATR and the overall Statutory corporate tax rate are very similar. This is not surprising as the DEATR usually is more sensitive to changes in the overall Statutory corporate tax rate than to changes in allowances (e.g. Devereux and Griffith, 2002).
Table 3  DEATRs 1996 – 2004 (selected years)

<table>
<thead>
<tr>
<th>Year</th>
<th>CZ</th>
<th>HU</th>
<th>PL</th>
<th>SK</th>
<th>SI</th>
<th>AUT</th>
<th>FR</th>
<th>GER</th>
<th>NL</th>
<th>UK</th>
<th>US</th>
<th>IT</th>
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<tbody>
<tr>
<td>1998</td>
<td>32.20</td>
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<td>36.67</td>
<td>19.24</td>
<td>26.38</td>
<td>32.41</td>
<td>45.56</td>
<td>29.65</td>
<td>25.74</td>
<td>32.92</td>
<td>32.76</td>
</tr>
<tr>
<td>1996</td>
<td>35.89</td>
<td>15.18</td>
<td>37.74</td>
<td>36.92</td>
<td>19.24</td>
<td>26.38</td>
<td>28.47</td>
<td>46.13</td>
<td>29.65</td>
<td>27.43</td>
<td>32.92</td>
<td>41.54</td>
</tr>
</tbody>
</table>

It is important to note that tables 2 and 3 show large differences in the levels of the overall Statutory corporate tax rates and the DEATRs. This is explained by the fact that the tax base matters for the calculation of a valid indicator of the tax burden levied upon corporate profits. The Statutory tax rate may thus be misleading. For example, the Statutory corporate tax rate for Germany is above 55 percent in 1996, but the DEATR is below 50 percent. From these two tables a country ranking of the level of the tax burden levied upon corporate profits is easily deduced.

Table 4  Country Ranking 1996 and 2004

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>HU</td>
<td>HU</td>
<td>HU</td>
</tr>
<tr>
<td>2</td>
<td>SI</td>
<td>SI</td>
<td>PL, SK</td>
<td>SK</td>
</tr>
<tr>
<td>3</td>
<td>UK</td>
<td>AUT</td>
<td>.</td>
<td>PL</td>
</tr>
<tr>
<td>4</td>
<td>AUT</td>
<td>UK</td>
<td>SI</td>
<td>SI</td>
</tr>
<tr>
<td>5</td>
<td>NL</td>
<td>FR</td>
<td>CZ</td>
<td>CZ</td>
</tr>
<tr>
<td>6</td>
<td>FR</td>
<td>NL</td>
<td>UK</td>
<td>UK</td>
</tr>
<tr>
<td>7</td>
<td>CZ</td>
<td>US</td>
<td>AUT</td>
<td>FR</td>
</tr>
<tr>
<td>8</td>
<td>PL, SK, US</td>
<td>CZ</td>
<td>FR</td>
<td>AUT</td>
</tr>
<tr>
<td>9</td>
<td>.</td>
<td>SK</td>
<td>NL</td>
<td>NL</td>
</tr>
<tr>
<td>10</td>
<td>.</td>
<td>PL</td>
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<td>IT</td>
</tr>
<tr>
<td>11</td>
<td>IT</td>
<td>IT</td>
<td>IT</td>
<td>GER</td>
</tr>
<tr>
<td>12</td>
<td>GER</td>
<td>GER</td>
<td>US</td>
<td>US</td>
</tr>
</tbody>
</table>

Table 4 shows that despite the level differences, the ranking of countries is almost independent of the indicator (Statutory tax rate or DEATR). It also shows that the CEE-NMS lowered their tax burden levied upon profits much more than the home countries. Especially Slovakia and Poland improved in the ranking between 1996 and 2004. Furthermore it is evident that the Czech Republic lost grounds within the CEE-NMS. To conclude, despite the differences in absolute levels one may well use the overall Statutory corporate tax rate if the aim is a simple ranking of countries.
Yet, as mentioned before, for an econometric estimation of tax-rate elasticities the variability of the indicator of tax burden is more important than the absolute level of the indicator. Therefore, the standard deviations (STD) of the various rates are compared (cf. table 5).

Table 5 Standard Deviations I (1996 – 2004)

<table>
<thead>
<tr>
<th>Country</th>
<th>STD Statutory Tax Rate percentage points</th>
<th>STD DEATR percentage points</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>3.33</td>
<td>3.61</td>
</tr>
<tr>
<td>HU</td>
<td>0.64</td>
<td>0.66</td>
</tr>
<tr>
<td>PL</td>
<td>6.31</td>
<td>5.97</td>
</tr>
<tr>
<td>SK</td>
<td>8.22</td>
<td>7.94</td>
</tr>
<tr>
<td>SI</td>
<td>0.00</td>
<td>0.55</td>
</tr>
</tbody>
</table>

The STDs reveal that the variability in the Statutory overall corporate tax rate and the DEATR are similar for most countries. Yet, as has been mentioned already the DEATR is not the relevant rate for analysing FDI, rather the Statutory tax rate has to be compared to the BEATR, which will be described in the following subsection.

3.2.2 Statutory tax rates and bilateral effective tax rates
The crucial point here is that in case of FDI and MNCs one has to consider the international tax code (double taxation agreements, supranational agreements as the parent-subsidiary directive) and the tax code of the home country (home country corporate income tax rate) in addition to the host country tax system. In order to answer the question whether Statutory tax rates can be used for estimations of tax-rate elasticities we now compare its variability to those of the BEATR. Table 6 shows the BEATRs for seven home countries (AUT, GER, FR, NL, IT, UK, US) and Slovenia.

---

20 Testing the null hypothesis of equal variability using the median-version of the Levene-Test (e.g. Eckstein 2000) gives p-values (far) above 20 percent for each country. Therefore the null hypothesis cannot be rejected.
Table 6  BEATRs with Slovenia

<table>
<thead>
<tr>
<th>Year</th>
<th>AUT</th>
<th>FR</th>
<th>GER</th>
<th>IT</th>
<th>NL</th>
<th>UK</th>
<th>US</th>
<th>SI (Statutory)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>18.28</td>
<td>19.49</td>
<td>19.66</td>
<td>18.40</td>
<td>18.30</td>
<td>22.79</td>
<td>32.47</td>
<td>25.00</td>
</tr>
<tr>
<td>2003</td>
<td>21.77</td>
<td>22.98</td>
<td>30.28</td>
<td>25.42</td>
<td>21.79</td>
<td>22.79</td>
<td>32.47</td>
<td>25.00</td>
</tr>
<tr>
<td>2002</td>
<td>18.85</td>
<td>20.11</td>
<td>27.69</td>
<td>22.71</td>
<td>18.87</td>
<td>19.92</td>
<td>29.97</td>
<td>25.00</td>
</tr>
<tr>
<td>2001</td>
<td>18.85</td>
<td>20.18</td>
<td>27.69</td>
<td>22.71</td>
<td>18.89</td>
<td>19.92</td>
<td>29.97</td>
<td>25.00</td>
</tr>
<tr>
<td>2000</td>
<td>18.85</td>
<td>20.27</td>
<td>28.63</td>
<td>22.74</td>
<td>18.89</td>
<td>19.92</td>
<td>29.97</td>
<td>25.00</td>
</tr>
<tr>
<td>1999</td>
<td>18.85</td>
<td>20.52</td>
<td>28.67</td>
<td>22.74</td>
<td>18.89</td>
<td>19.92</td>
<td>29.97</td>
<td>25.00</td>
</tr>
<tr>
<td>1998</td>
<td>26.12</td>
<td>20.64</td>
<td>26.92</td>
<td>22.74</td>
<td>18.89</td>
<td>20.93</td>
<td>29.97</td>
<td>25.00</td>
</tr>
<tr>
<td>1996</td>
<td>26.12</td>
<td>20.28</td>
<td>26.95</td>
<td>23.13</td>
<td>18.89</td>
<td>22.94</td>
<td>29.97</td>
<td>25.00</td>
</tr>
</tbody>
</table>

Table 6 shows that the levels of BEATRs are different from the level of the Statutory tax rate (25 percent). Also, a substantial drop in almost all bilateral rates occurred. An exception is the BEATR for the US-Slovenia country pair, which increased slightly. This increase is due to the constant overall Statutory corporate tax rate in the US and in Slovenia compared with constant allowances in the US and a change in allowances in Slovenia (in 2003). The exceptional increase in 2003 and the subsequent fall in 2004 are due to a remarkable reduction of allowances in Slovenia and the adoption of the parent-subsidiary directive in 2004, which reduces the EATRs for countries which apply the exemption method.21

Concerning other BEATRs not shown here, Slovakia had the highest BEATR vis-à-vis all home countries in 1996 (the first year of examination). Hungary (vis-à-vis two) and Slovenia (vis-à-vis five) home countries had the lowest BEATRs. In 2004 (the last year of examination) the Czech Republic has the highest BEATR vis-à-vis all home countries and again Hungary and Slovenia the lowest. Now Hungary has the lowest rate vis-à-vis five and Slovenia vis-à-vis two home countries. Hungary and Slovenia changed ranks. Why Hungary does not have the lowest rate vis-à-vis the UK and vis-à-vis the US is explained by the credit system, namely in the case of repatriated dividends combined with a relatively low tax rate (e.g. in Hungary). The resulting tax on dividends is therefore much higher in Hungary than in Slovenia.

A comparison of the average BEATR (across home countries) vis-à-vis each single host country for the years 1996 and 2004 shows that in 1996 the host country with the lowest average BEATR is Slovenia, followed by Hungary, Poland, the Czech Republic and Slovakia (cf. table 7). The standard deviation (STD) is about 9.4

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21 For this reason, the development is different in the UK and the US, two countries which apply the credit system (see table 6).
percentage points (pp) in 1996. Until 2004 the ranking has changed: Hungary is in first place, Slovenia in second, Poland remains in third, Slovakia is in fourth and the Czech Republic in fifth place. In 2004 the STD is much lower than in 1996, thus the CEE-NMS-5 converged substantially in BEATRs. The largest drop in the average bilateral rate occurred in Slovakia and Poland. The smallest drop occurred in Slovenia, but Slovenia had a relatively low Statutory tax rate and BEATR throughout the period 1996–2004.

Moreover, the ranking within the CEE-NMS is different to the ranking by the Statutory tax rate and the DEATR. With respect to the BEATR Hungary is the most tax favourable host country and the Czech Republic is the least favourable host country in 2004. On a bilateral basis Slovenia is more favourable than Slovakia and Poland in 1996 and 2004 which is an important difference to the ranking resulting from Statutory tax rates or DEATRs.

Table 7  
<table>
<thead>
<tr>
<th>Year</th>
<th>CZ %</th>
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<th>PL %</th>
<th>SK %</th>
<th>SI %</th>
</tr>
</thead>
<tbody>
<tr>
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<td>21.92</td>
<td>22.25</td>
<td>21.34</td>
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<td>25.00</td>
<td>30.74</td>
<td>31.44</td>
<td>22.59</td>
</tr>
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<td>32.26</td>
<td>34.47</td>
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</tr>
<tr>
<td>1999</td>
<td>36.96</td>
<td>25.05</td>
<td>35.07</td>
<td>43.13</td>
<td>22.79</td>
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<td>1997</td>
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<td>1996</td>
<td>41.68</td>
<td>25.02</td>
<td>39.69</td>
<td>43.09</td>
<td>24.04</td>
</tr>
</tbody>
</table>

change  Change  change  change  change
-13.71  -5.27  -17.77  -20.84  -2.70

BEATRs are surely better indicators of the tax burden faced by MNCs than Statutory tax rates. Yet, if their variability is the same as those of the Statutory tax rates one could also use the latter in an econometric specification. This, however, need not be the case - notably for host countries with relatively stable Statutory corporate tax rates. For a particular country pair Austria – Slovenia, table 8 shows that the variability of the BEATR is much higher than those of the Statutory tax rate (which in
this extreme case is zero). This is because BEATRs cover all important tax codes and hence include more potential sources of variability than the DEATRs and Statutory tax rates. For the bilateral relationship Austria - Slovenia the main sources of variability are the adoption of the double taxation agreement which entered into force 1999, the changes in allowances in Austria from 2001 and in Slovenia from 2003 onwards as well as the adoption of the parent-subsidiary directive in 2004 by Slovenia. It is important to note that the calculated variability is high despite both countries have constant Statutory tax rates during the sample period. Also note that one may find several other country pairs with quite different STDs in the BEATRs and the Statutory corporate tax rates (e.g. Germany-Slovenia (2.98 pp vs. 0.0 pp); Austria-Hungary (3.02 pp vs. 0.65 pp), Italy-Hungary (3.10 pp vs. 0.65 pp)).

Table 8 Standard Deviations II (1996 – 2004)

<table>
<thead>
<tr>
<th>Year</th>
<th>BEATR AUT-SI %</th>
<th>SI Statutory tax rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
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<td>2003</td>
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<td>26.12</td>
<td>25.00</td>
</tr>
<tr>
<td>1996</td>
<td>26.12</td>
<td>25.00</td>
</tr>
</tbody>
</table>

STD Percentage points 3.58 Percentage points 0.00

4 Summary and Further Steps

The purpose of this paper was to discuss the appropriateness of measures of tax burden as a factor explaining the location decisions of MNCs. First, on the basis of a survey of six empirical studies a median value of the tax-rate elasticities of FDI in CEE-NMS and mediterranean periphery countries was derived. Second, building on our criticism of FDI as a measure reflecting multinational activity and the Statutory tax

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22 In the case of the DEATRs both the Statutory tax rate and DEATR series had no or a very low variability.
23 Using the Levene-Test again we reject the hypotheses of equal variances for several country pairs (e.g. AUT-SI, GER-SI, US-SK).
rate as a measure of tax burden, BEATRs following Devereux and Griffith (1998) for seven home and five host countries were calculated.

Our analysis shows:

1. ETRs are warranted as a rough measure of the tax burden levied upon capital, whereas the Statutory tax rate may be very misleading.

2. EABTRs are much better indicators than DEATRs or Statutory tax rates to assess the tax burden on FDI.

3. Empirical estimates of tax-rate elasticities should be based on bilateral rates, which usually have a different variability than Statutory tax rates. This is in marked contrast to authors (e.g. Javorcik 2004) who argue that the differences between the Statutory tax rates and EATRs are negligible. However, such a comparison is flawed, since the host country’s Statutory tax rate must not be compared to the host country’s domestic EATR, but to the host country’s BEATRs.

4. Using BEATRs as a tax indicator instead will prevent a bias resulting from a “measurement error”.

5. Economic theory should be used to select the other right-hand-variables in order to prevent an omitted variable bias. Our reading of the literature and the empirical evidence that has been produced so far is that one has to include a large number of factors which may affect FDI besides taxes (e.g., Bernard et al. 2004; Bevan et al. 2004; Mudambi, 2002). These factors include firm characteristics as well as home and host country characteristics, defined in relative terms on a bilateral level. The selection of these explanatory and control variables should be guided e.g., by the OLI-paradigm.

6. As no study has used BEATRs for calculating tax-rate elasticities of FDI in the CEE-NMS so far one should to be very cautious in interpreting the available elasticities (magnitude and sign). Two relevant policy implications24 may be

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24 Since the tax elasticities have been derived under the ceteris paribus condition, a caveat seems to be in order here: (a) If despite the tax rate has been lowered, FDI does not react, this could be a sign of a high share of market-oriented FDI or that the tax burden accounts only for a small share in total costs concerning efficiency-oriented FDI. (b) If, despite the tax rate has been increased, FDI does not react this could be interpreted as MNCs engaging in transfer-pricing and like activities.
derived from the of the tax-rate elasticity, if a causal relationship exists between location choice and tax rate:

- If tax-rate elasticities wrt FDI are low, lowering corporate tax rates leads to a loss of tax revenues, without increasing the amount of inward FDI.
- If tax-rate elasticities wrt FDI are high, then either the “Leviathan” view (i.e. overprovision of public goods) or the traditional view (i.e. underprovision of public goods) may be taken. In the first case, tax competition will be viewed favourably, in the second case, tax coordination or even harmonization will be preferred.

Finally it should be mentioned that the results on ETRs derived on a bilateral level for a number of home and host countries are grossly in line with results reported in other studies (e.g. Yoo, 2003; Jacobs et al. 2003). Yet, the particular time range and the selection of the countries clearly make the derived BEATRs a unique basis for further analysis of location-choice of MNCs in CEE-NMS.

5 References


KPMG (ed., various years) Corporate Tax rate Surveys, web download.


6  **Data sources**

- The main source for tax data is the European Tax Handbook (various years) of the International Bureau of Fiscal Documentation; KPMG’s Corporate Tax rate Surveys (various years); and Yoo (2003).
- Information about the asset structure in the CEE-NMS is taken from the Vienna Institute of International Comparative Studies’ database.

7  **Appendix: Impact of the pre-tax financial return upon the bilateral effective average tax rate**

The calculation of forward looking ETRs using the Devereux-Griffith methodology requires several assumptions. One crucial assumption is the value of the fixed pre-tax financial return \( p \). Devereux and Griffith (1998) show that in the absence of personal taxes on interest income and capital gains the BEATR approaches an adjusted Statutory tax rate with increasing \( p \) (p. 29f). Moreover they show that the BEATR increases with \( p \) if the bilateral EMTR is below the adjusted Statutory tax rate and decreases in the other case. The adjusted Statutory tax rate is thereby defined as:

\[
t_{\text{adjusted}} = t_{\text{Statutory}} + \text{tax\_div} \times (1 - t_{\text{Statutory}})
\]

As an example the impact of changes in \( p \) upon the BEATR of FDI from Austria to Slovenia for the year 2003 is demonstrated. In 2003 the host country Statutory tax rate was 25 percent and the tax on repatriated dividends (\( \text{tax\_div} \)) was 5 percent. Therefore the adjusted Statutory tax rate is 28.75 percent. As the BEMTR lies below this value, the BEATR should increase with \( p \).

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25  We additionally assume that their discrimination parameter between new equity and retained earnings is one. This is possible as we are excluding the personal sphere of the shareholder (see Yoo 2003).
26  Due to the very generous allowances for investments in machinery in Slovenia this rate is very low.
Table 9  Effect of increasing $p$ on BEATR

<table>
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<th>$p$</th>
<th>EATR</th>
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Table 9 shows that the BEATR indeed approaches the adjusted Statutory tax rate with increases in $p$. 