Klára Katona

Changing reasons of foreign investment to Central and Eastern Europe

The purpose of this study is to examine the inward FDI (foreign direct investment) potential index in the Eastern European region. The FDI index was elaborated by the UNCTAD and serves to determine the ability of countries to attract foreign capital. International and regional findings show that capital investment decisions are influenced by the following factors: market size, openness and competitiveness of the country's economy, development of infrastructure, quality of human capital, country risk, impact of privatisation, tax policy, tax rate, cost and productivity of labour. The actual values of these variables before and after EU accession need to be analyzed for the specific countries in the region. The resulting benchmark exercise will not only reflect the impact of these factors on the FDI potential of the countries but also point out the different effects which EU accession had on the economies concerned.

MOTIVATIONS OF WORKING CAPITAL INVESTMENTS PRIOR TO EU ACCESSION

Relevant technical literature sources basically cite two reasons for capital influx to Central and Eastern Europe during the period of market economy transition: investors were attracted by either the opportunity to gain new markets or to reduce production costs (low labour cost, tax allowances, etc.).

Most studies argued that market oriented investments were dominant (Meyer, 1995; Lankes and Venables, 1996; Tüselmann, 1999; EBRD survey in 2000). The significance of cost reduction was only detectable in the case of export-oriented countries and tax allowances alone did not prove to be an effective tool in motivating foreign investors. (Beyer, 2002; Sedmihradsky, M. – Klazar, St., 2002; Edmiston, K. – Mudd, S. – Valev, N., 2003)

Analyzing the capital influx of the period right before EU accession, *Patkó* (2003) found that the factors which affected investor decisions related either to regional characteristics (geographical location) or to sub-regional advantages. Regarding the former, the countries in the region are nearly identical while they are different regarding the latter. Sub-regional advantages can be broken down to further sorting criteria like profitability (market size, input costs, accessibility), country-specific features (political and economic risk, macroeconomic stability, stability of the institution system) and the method, pace and extent of privatization. According to Patkó's analysis, the countries under review did not show any

major differences regarding profitability and country-specific features between 1999 and 2003. There were differences, however, in respect of privatisation. Due to this single factor, working capital investments in the region were as follows in the 1999–2003 period: compared to the respective GDP figures, the highest FDI flowed to the Czech Republic and Slovakia while this indicator remained unchanged for Hungary and Poland. *This way, privatization was decisive for annual FDI flows to the region.*

Capital accumulation in the region's economies played a key role in the economic transformation and growth which preceded EU accession. According to Dobrinsky (2007), however, out of the three sources (domestic savings, FDI, bank loans) that helped eliminate the barriers to financial investments, banking loans played a more important role than foreign investments in Central and Eastern Europe, supposedly due to the quick establishment of a high-quality banking system.

The time elapsed since accession (2004) is relatively short for the analysis of capital flows in that period. The analysis is also made difficult by the fact that for a long time now, the region has not been regarded as a separate area in international statistics but as part of the developed countries category (where Western countries belong). Whether this classification is valid in terms of capital market competitiveness is still to be seen. Below we seek an answer to this question.

CAPITAL MARKET COMPETITIVENESS OF THE REGION IN THE LIGHT OF UNCTAD INDICATORS

For the purposes of its yearly reports (the World Investment Report, WIR), the UNCTAD (United Nations Conference on Trade and Development) elaborated a number of indicators and indices to measure the impact and significance of capital influx to different regions of the world from the viewpoint of host countries. Indices of this series that deserve mentioning include the FDI flow/gross investment (Gross Fixed Capital) ratio, changes in the number of bilateral or multilateral agreements, the transnationalisation index, FDI performance and FDI attractiveness. While the UNCTAD also tracks the trends of these indicators per region, it considered Central and Eastern European (CEE) countries a separate region only until 2004, the year of their EU accession. Since that year, the countries concerned have been shown together with other EU member states in the yearly reports and therefore data gathering is only possible on an individual country level.

Below we set out to analyse the changes of the transnationalisation index, FDI performance and FDI attractiveness in the region. There are several reasons for picking these indicators from the set described above. First, these ratios provide the most information regarding competitiveness. Second, in respect of the other indicators, the trends in CEE countries do not differ significantly from the global average. Third, the historic figures of these indices are available in UNCTAD's yearly reports for the past 15–20 years.

The level of transnationalisation can be applied to international companies and countries. For the purposes of our analysis, the latter approach is of interest. The level of a country's transnationalisation is calculated as the average of four ratios: the country's annual FDI (flow)/gross capital investments, FDI (flow)/GDP and the contribution of the local subsidiaries of foreign parent companies to the country's GDP and employment. Based on this calculation, the average transnationalisation index of developed countries was nearly 25 while the related figure equalled 20 in the

developing region and 16 in CEE countries in 2003 (WIR, 2004). Underneath the average points, however, significant differences were found and the deviation of ratios was considerable even for specific countries. In 2003, the four best scores in the region were achieved by Macedonia, Estonia, Hungary and the Czech Republic, with the other countries lagging far behind. The level of transnationalisation in these four countries was above 30 points or close to it which is outstanding both on a regional or global scale.

This picture changed somewhat by 2005 but the significance of foreign capital continued to increase. As mentioned before, CEE countries were transferred to the group of developed countries in relevant statistics. *However, their exposure to international capital either remained unchanged or increased after accession to the EU.* Following Belgium and Luxemburg, from the third to the seventh in rank we find CEE countries. Their respective indices were between 33–49 points, significantly exceeding (actually almost doubling) the group average of 25 points (WIR, 2008). *This index value indicates that foreign capital plays a decisive role in GDP generation, capital investments and employment in these countries.*

The *FDI performance index* shows a country's share in global foreign capital investments versus the country's share in the global GDP. If the resulting figure is above 1, the country attracts more capital than generated by its own economic performance. Obviously, a figure below 1 indicates that the country's attractiveness is the performance of its economy. *In the years 1988 through 2003, CEE countries consistently achieved a figure above 1 and the average index equalled 1.35 by the end of the period. This high value is not surprising in the case of transforming and emerging countries.*

UNCTAD ranks the countries based on the FDI performance index. Surveys carried out in 2001–2003 show that on a global ranking,

Estonia ranked 10th which was the best score in the region. Slovakia and the Czech Republic ranked 12th and 13th. Hungary, Lithuania ranked 33rd and 41st respectively, while Poland slid back to the 68th position. After EU accession, Estonia was the only country that could retain and improve its position (to 8th). No other new member state could make it to the first 20 countries.

The decrease of the performance index does not necessarily mean a setback. It rather shows that similarly to other developed countries, the new member states reached a quasi equilibrium regarding foreign capital influx which matches their actual level of development (market size) and thus does not deviate from the group average.

The FDI attractiveness (inward FDI potential) index is a more complex indicator. These twelve variables are needed for calculating it: GDP growth rate, GDP per capita, share of exports in GDP, number of phone lines and mobile phones per 100 inhabitants, commercial energy use per capita, share of R+D expenditures in gross national income, share of tertiary level students in the population, country risk, exports natural resources as a percentage of the world total, imports of electronics and automobiles as a percentage of the world total, FDI influx as a percentage of the world total.

By the early 21st century, Central and Eastern Europe caught up with the global average as its inward FDI potential index reached 0.221. (The global average was 0.220). At the same time, with a view to the 1988–2003 average, none of the countries of the region made it to the world's first 25 countries in terms of inward FDI potential. This did not change after EU accession either, as new member states score between 33 and 53 on the global ranking. *(See table 1)*

Combining the two indices (performance and inward FDI potential), the UNCTAD assigned each country based on its capital mar-

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**POSITION OF CENTRAL AND EASTERN EUROPEAN COUNTRIES
ON A COUNTRY RANKING BY INWARD FDI PERFORMANCE INDEX AND INWARD
FDI POTENTIAL, 2005–2007**

	Inward FDI performance index			Inward FDI potential index		
	2005	2006	2007	2005	2006	2007
Czech Republic	31	34	41	39	39	….
Estonia	6	9	8	35	34	….
Hungary	40	38	45	42	41	….
Latvia	47	33	31	43	42	….
Lithuania	69	52	53	40	38	….
Poland	56	51	60	44	43	….
Slovakia	30	28	49	54	53	….
Slovenia	95	98	94	32	33	….

Source: UNCTAD, WIR, 2008

ket competitiveness into one of four groups which thus created a matrix:

❶ Front-runners: high FDI performance – high FDI potential

❷ Above potential: strong capital market performance – low FDI potential

❸ Below potential: low capital market performance – high FDI potential

❹ Under-performers: low capital market performance – low FDI potential

Based on 2006 data, practically all new member states were in the front-runner category in terms of performance and investment opportunities (inward FDI potential). This fact is definitely promising regarding the future of the region and sends a positive message to investors.

Besides the overall inward FDI potential, it is also important to see how the performance of individual countries affects the investment decisions of foreign investors and what factors need to be strengthened or weakened to increase capital market competitiveness. Below we compare these factors for the period before and after EU accession. We do not strive for a comprehensive macroeconomic analysis as it would exceed the scope of this study.

CHANGE OF VARIABLES IN THE INWARD FDI POTENTIAL INDEX IN CENTRAL AND EASTERN EUROPE

Market size

Several indicators are in use for measuring the market size of an FDI host country. The most common indices are GDP, GDP growth rate, population and income per capita.

In the first period (1996–2000), the growth rate of CEE countries (except for Estonia) changed more or less simultaneously in a 2-5 per cent range. In 2000–2001, GDP growth decelerated not only in the region but in OECD countries as well. After EU accession (2004), breaking away from EU and OECD averages, most new members demonstrated impressive growth. The only exception was Hungary where GDP growth fell from 4.8 per cent to 1.1 per cent by 2007, following two years of stagnation.

Due to the similarity of economic development, population can also provide a rather good indication of the region's market capacity. As the timeline under review is relatively short, the population of the individual countries can

be considered more or less constant. The differences in market size between specific countries are apparent in *Chart 1.*

Regarding GDP per capita, each country under review demonstrated linear growth. The approximate rankings are as follows: Slovenia and the Czech Republic hold the first two positions. Hungary, Slovakia and Estonia hold the third place in a tie while Poland lags behind slightly at the sixth place.

When examining the role of market size in FDI inflows, the interworkings between these two factors must also be taken into consideration as pointed out in technical literature (Agarwal, 1980; Choe, 2003), as working capital influx usually triggers a GDP increase in the host country. Consequently, the direction of the cause-and-effect relationship is difficult to identify.

Openness and competitiveness of the economy

The same way, the direction of causality is unclear in respect of competitiveness and openness in exports and imports as well. While working capital influx may change significantly the export-import structure and orientation of a country, it can also affect the volume and balance of imports and exports.

One of the best metrics of economic openness is the exports-imports/GDP ratio. In the countries of the CEE region (except for Poland), this indicator significantly exceeded the OECD and EU average in the period under review. While this ratio was high initially, it grew consistently after 1996. After peaking in 2000, it fell slightly at the beginning of the new millennium. *In the wake of EU accession,*

Chart 1

POPULATION OF THE COUNTRIES OF CENTRAL AND EASTERN EUROPE IN 1990–2008
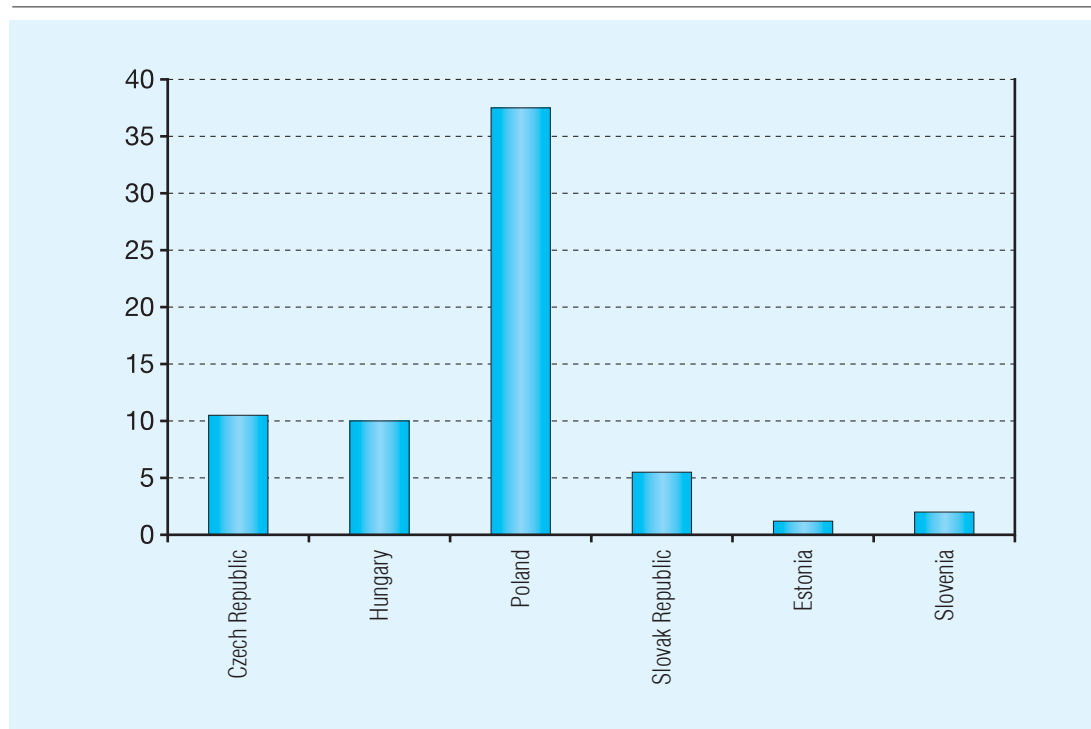
Source: OECD Factbook 2009, Economic, Environmental and Social Statistics - ISBN 92-64-05604-1 - © OECD, 2009

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however, the region's dependence on foreign trade begin to rise again and reached outstanding levels compared to the OECD average which fluctuated between 20 and 30 per cent in the past 12 years. Openness in foreign trade correlates with country size and thus it is not by accident that Poland's export-import/GDP ratio blends smoothly with the EU average (see Chart 2).

Number of telephone lines, use of energy

The key role of infrastructure in capital investment decisions is getting more and more emphasis in technical literature. In the UNCTAD's approach, the significance of traditional infrastructure is measured by commercial energy use while the presence of modern IT and telecoms infrastructures is indicated by the growth of telephone main lines. The importance of the latter is pointed out by *Moosa et al.*

(2005) in an article which suggests that out of all reviewed and possible factors that determine inward FDI potential, the role of telephone penetration is generally proved.

Regarding the number of telephone lines and number of households with internet access and a PC, CEE countries have shown a rather dynamic development. While the telephone penetration was 25–50 per cent of the OECD average in 1991, *each new member state reached at least 90 per cent of the related OECD figure by 2007* while the Czech Republic and Slovenia even exceeded it. The number of internet user households has grown at a somewhat lower rate but it is also catching up with the European average.

R+D expenditures and share of tertiary level students

The quality of human capital and technology in an FDI host country is equally important for

Chart 2

EXPORTS-IMPORTS/GDP RATIO IN CENTRAL AND EASTERN EUROPE, 1995–2007
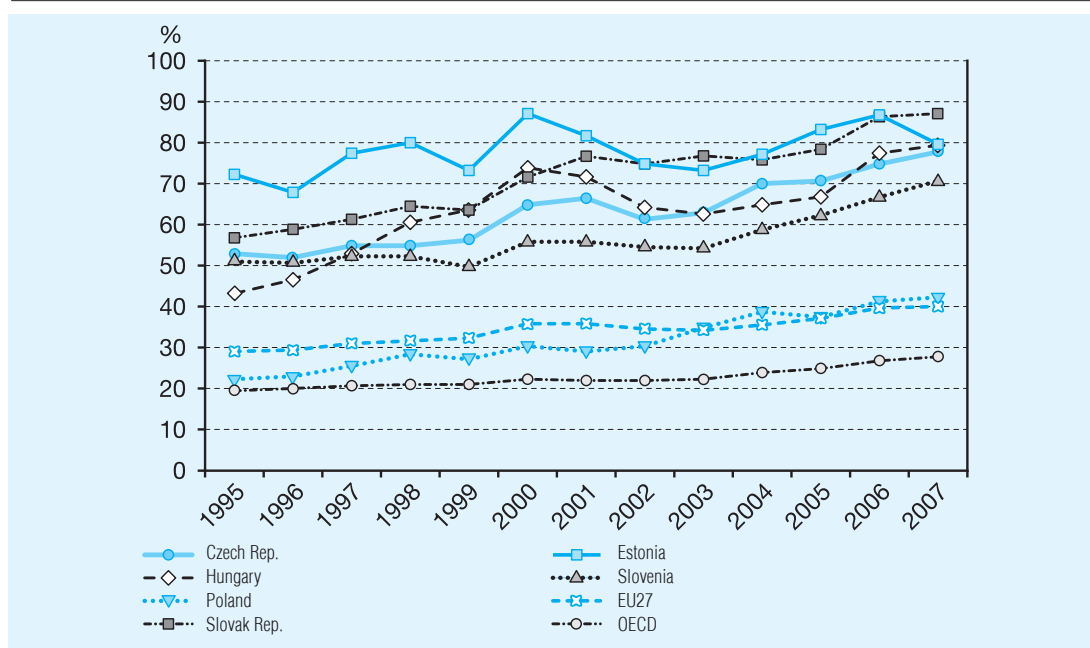
Source: OECD Factbook 2009, Economic, Environmental and Social Statistics -ISBN 92-64-05604-1 - © OECD, 2009

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enticing capital and for the efficiency of technology spillovers (Dimelis, (2005); Sanna – Randaccio, 2002). Both investor and host can only benefit from a capital investment project if a sufficiently developed knowledge base is in place for adapting the imported technology. In technical literature, the share of R+D expenditures as a percentage of the GDP and the ratio of tertiary education graduates within the total population are considered good approximations for determining the quality of this knowledge base.[1]

Chart 3 shows the average share of R+D expenditures in the GDP in the CEE region, in the EU and in OECD countries. It is apparent that the *CEE region lags behind both the EU and the OECD, only Slovenia and the Czech Republic are close to the internationally expected expenditure level.* (The chart only reflects the relative backlog as a percentage of the GDP but the absolute fig-

ures show an even wider gap.) Regardless of EU accession, government support to research and development ranged between 0.5 and 1.5 per cent in the past 10–12 years and practically stagnated.

In the past 10 years, the quality of human capital increased consistently when measured by the share of students in tertiary education within the total 25–64 year-old population. The ratio of university and college graduates went up by at least 27 per cent in the years 1997-2006 and now ranges between 14–21 per cent in the region. *Despite the positive trend, the new member states (except Estonia) fail to reach the 27 per cent average of OECD countries in respect of this indicator.*

A new human capital index which facilitates international benchmarking is the ranking generated from the so-called PISA surveys. *According to this survey, the academic performance of CEE countries scored around the OECD*

Chart 3

SHARE OF R+D EXPENDITURES AS A PERCENTAGE OF THE GDP IN CEE COUNTRIES, 1995–2007
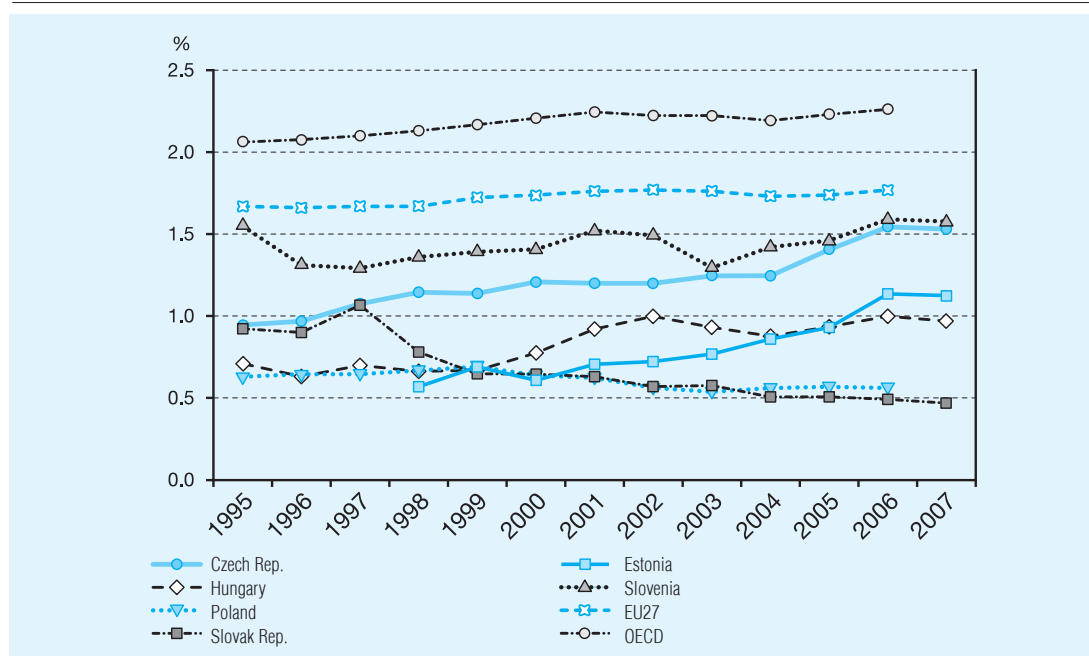
Source: OECD (www.oecd.org)

average in 2006. Ranking 10th and 15th respectively, the Czech Republic and Hungary were slightly above the average while Poland (17th) and Slovakia (22nd) were slightly below it. (OECD Factbook, 2009; Economic, Environmental and Social Statistics – ISBN 92-64-05604-1 – © OECD, 2009)

Country risk

We used Euromoney's data and methodology to specify the extent of country risk. Euromoney usually publishes two country risk rankings per year, one in March and one in September. As the volume of capital flows into a country is affected more by trends that prevail at the beginning of the year than the risk factors published in the fourth quarter, we used the March data as the starting point. (Except for 1998 as only September data are available for that year.)

In Euromoney's methodology, country risk is calculated from the weighted average of nine categories. A higher score means a higher ranking for a country and the higher the ranking the lower the associated risk. The categories taken into consideration for weighting are as follows:
- economic performance (25 per cent weighting),
- political risk (25 per cent weighting) primarily includes the risk of non-payment or

non-repatriation. Scoring is performed by specialists of local credit institutions,
- debt indicator (10 per cent weighting), generated using ratios from the World Bank's debt tables (current account deficit, sovereign debt as a to GNP per cent),
- debt in default or rescheduled (10 per cent weighting), based on the World Bank's debt tables,
- lending ranking (10 per cent weighting), based on Moody's ranking,
- access to bank finance (5 per cent weighting), calculated with a view to the ratio of disbursed loans vs. the country's GNP,
- access to short-term finance (5 per cent weighting), based on OECD database,
- access to capital markets (5 per cent weighting), heads of debt syndicate and loan syndications rated each country's accessibility to the international bond and syndicated loan market,
- discount on forfeiting (5 per cent weighting), showing the difference from the risk-free alternative.

The countries in the region demonstrated a more or less similar trend of improvement and stagnation in the period under review and their respective risk ratings were not too different either. 1998 was an extraordinary year as the Russian stock exchange crisis triggered a deterioration of risk ratings throughout the region. (See Table 2)

Table 2

COUNTRY RISK IN FIVE COUNTRIES OF CENTRAL-EASTERN EUROPE AS SCORED BY EUROMONEY, 1998–2008

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Hungary	55	65.8	61.8	72.1	70.2	71	67.7	68.82	68.50	–	–
Czech Republic	52.3	62	60.2	64.2	68.5	67	66.5	69.38	68.82	70.24	70.67
Poland	52.1	62.1	61.7	63.4	65.8	65.2	62.8	65.24	66.26	67.80	68.32
Slovenia	55.4	70.1	71.3	71.8	73.8	74.3	76.7	78.69	79.62	81.75	81.14
Slovakia		48.3	48.4	56.9	62.5	59.3	62.4	64.73	64.87	66.70	67.37

Source: Euromoney

CHANGES IN OTHER FACTORS THAT DETERMINE THE REGION'S CAPITAL MARKET COMPETITIVENESS

Besides the elements of the inward FDI potential index, these two factors play a key role in shaping the capital market competitiveness of CEE countries: tax policy and the cost of human capital. The individual countries made serious steps to influence both. Although technical literature failed to prove the existence of a significant correlation between the tax rate and capital influx (Feld-Heckemeyer, 2009), CEE countries are running a tax race for investors and take turns in offering the highest benefits and tax cuts to them.

According to the cited technical literature sources, labour costs are important for export-oriented investments and therefore they must be part of the analyses.

Tax policy

In the analysis of tax burdens, benchmarking is based on the tax rates of both investing countries (typical EU member states) and capital market competitors (i.e. CEE countries) in order to reveal existing benefits and drawbacks.

In competitor countries, the legal frameworks already harmonised with EU legislation before EU accession. Foreign investors enjoyed the same rights as their domestic peers. They were fully entitled to acquire equity stakes in companies and the common company forms were present throughout the region. The freedom of capital inflows and capital and profit transfers were all provided for in Central and Eastern Europe. Consequently, it is taxes where a significant difference can be captured in respect of competitiveness.

Corporate tax is an outstandingly important tax type both for investor and host countries. From a macroeconomic standpoint it is a rev-enue category while on a microeconomic level it is a cost. The reason for its significance is that the *corporate tax rate has a fundamental effect on the will to enterprise. Therefore, the tax competition of host countries primarily focused on this tax type.*

Hungary set a corporate tax rate that was extraordinarily low not only in comparison to the EU average (30–35 per cent) but compared to the tax rates of other Central and Eastern European countries as well. After the initial 40 per cent, Hungary's corporate tax rate was reduced dramatically from 36 to 18 per cent in 1995. This rate was the lowest in the region in the late nineties. (From 2004 on, business only paid a 16 per cent tax on their profits.) As shown in *Table 3, Hungary retained its competitive advantage in respect of corporate tax in the 21st century as well, since Slovakia and Poland were the only rival countries that introduced a similarly low tax rate.* (Just to compare, the corporate tax rate was 35 per cent in the USA, 30 per cent in the UK and 26 per cent in Germany in 2007.)

Table 3

CORPORATE TAX RATES IN CENTRAL AND EASTERN EUROPE IN 2007

Country	Corporate tax rate (per cent
Czech Republic	24.0
Hungary	17.33 (16.0)
Poland	19.0
Slovakia	19.0

Source: www.oecd.hu

After EU accession, however, a new challenge emerged and the contest entered into a new phase as many countries introduced a flat tax. Although most of these countries are in Central and Eastern Europe, Hungary is not among them. (Estonia, Latvia, Lithuania, Romania and Slovakia introduced a flat tax, too.) As a flat tax regime is simple, easy to manage and last but not least

involves a low rate, it provides the most attractive environment to companies.

On an international benchmark, CEE countries are below the OECD average regarding the share of income tax revenues in the GDP. In the early nineties, tax revenues as a percentage of the GDP were in line with the OECD average even in Hungary and Poland, but due to the tax competition among the countries, these indicators decreased significantly. By 2007, even Hungary, the country with the highest figure reached two thirds of the OECD average while the Slovak Republic, the country with the lowest tax revenues, failed to reach even half of that level. *(See Chart 4)*

In the period before EU accession, the magnitude and scope of tax allowances and subsidies also played an important role besides tax rates. In the competing countries, tax allowances and tax reliefs were available to foreign investors on nearly identical terms (export-oriented production, job creation, minimum investment – usually 5 to 10 million USD – for 10 years).

The option to set up special economic zones was still there after EU accession. These areas are intended to help the development of certain regions of a country by enticing foreign capital.

Cost of labour

In order to judge the capital market competitiveness of a country based on the cost of labour, changes of multiple factors must be taken into consideration simultaneously. These factors are as follows: net value of wages, changes of income tax obligations and social security contribution levied on wages, other contributions payable by employers and, last but not least, the changes of labour productivity.

Chart 4

PROFIT AND INCOME TAX AS A PERCENTAGE OF THE GDP IN CEE COUNTRIES, 1990–2007
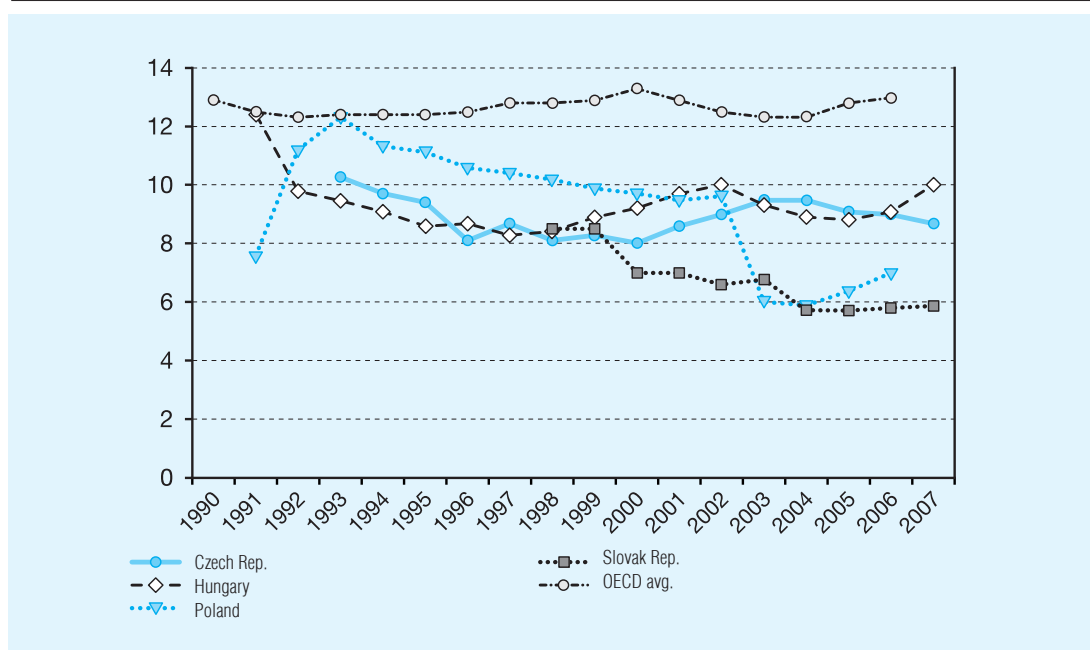
Source: OECD (www.oecd.org)

The changes of labour costs in four CEE countries are shown in *Chart 5.*

In these four countries, wages grew continuously between 1995 and 2007. No significant differences could be detected regarding average hourly wages. The wages graphs of the Czech Republic and Hungary were almost identical. Out of the other rivals, Estonia and Slovakia had more competitive wages than the other two.

Gross wages are fundamentally determined by the rate of income tax and employee contributions charged on net wages. In the region, Hungary has the highest percentage rate of taxes and contributions charged on average wages. In the past 7 years, these rates have been consistently above 50 per cent while counted at an average, the related burdens are 10 per cent lower in the other countries of the region. By introducing a flat tax, the Slovak Republic reduced the overall rate of taxes charged to employees to 38.5 per cent by 2007 which more or less harmonises with the OECD average (37.7 per cent).

From the employer's (foreign investor's) viewpoint, the rate of social security contribution and employer contribution are more important as these levies are payable exclusively by the employer. *Social security contributions charged on wages are nearly identical in the countries under review and match the EU average (social security contributions in EU countries range from 25 to 35 per cent). The Slovak Republic continues to be an exception with reducing one of the highest rates, 38 per cent to less than 15 per cent over 10 years.*

If we were to pass a judgement strictly on the basis of percentages, we could conclude (especially for Hungary) that the overall personnel-related expenditures of businesses operating in CEE countries is higher than that

Chart 5

HOURLY WAGES IN THE ECONOMIES OF FOUR NEW EU MEMBER STATES, 1995–2007
(calculated in USD and purchasing power parity)
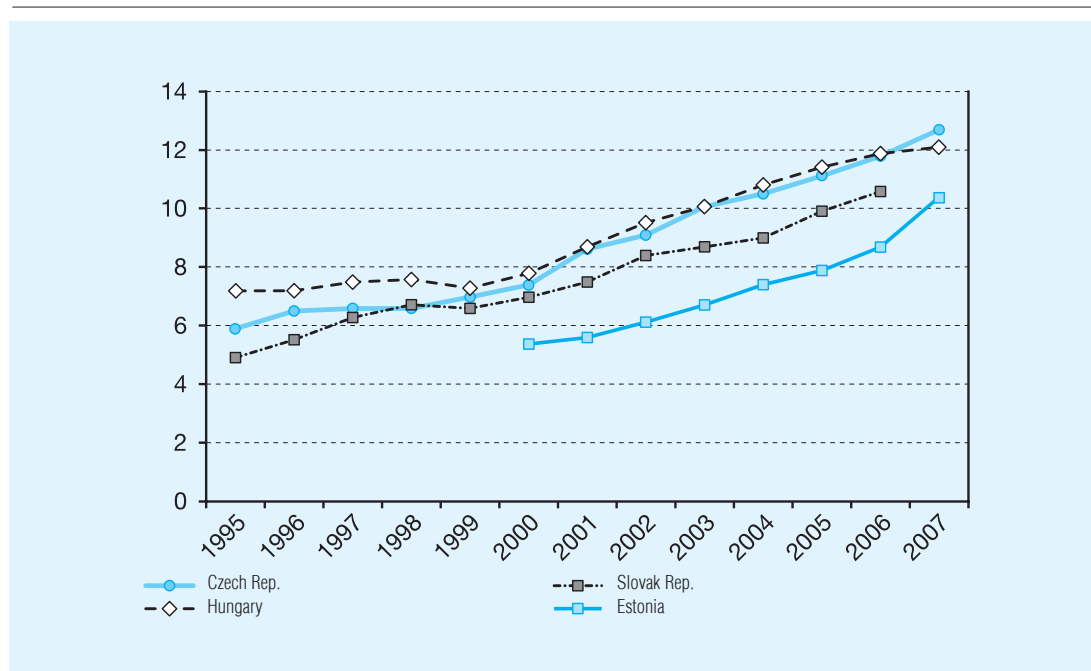
Source: OECD (www.oecd.org)

of their Western European peers (Schlett, 2003). This approach can be especially damaging for a "superficially informed" foreign investor when making investment decisions. It is a fact, however, that wages *costs, i.e. the calculation base of any income tax and other employer contributions charged on wages are far below the European level in the region.* Average gross wages in the euro zone were 8 times higher than Hungarian wages. Then due to economic growth, this multiplier dropped to 5 (Eurostat).

Chart 6 shows that only Mexico had "more competitive" hourly wages than CEE countries in 2007.

The significance of labour costs cannot be analysed without examining the productivity of labour. The correlation between the two can be measured with the ULC indicator. ULC *(Unit Labour Cost)* is the ratio of total labour costs to productivity. Productivity can be expressed approximately with the added value generated by the domestic workforce (i.e. the GDP). Obviously, the lower the indicator value, the more competitive and attractive the country is for investors. The ULC indicator enables the comparison of different countries in terms of labour market productivity without having to struggle with the conversion of national currencies. *(See Chart 7)*

The ULC index improved (i.e. decreased) consistently in 1995-2000. From 2000 on, wages grew at a higher rate than productivity. After 2002, Poland's ULC index decreased the most, then in 2005 Estonia's ULC figure deteriorated suddenly. In the rest of the region, the respective ULC indices changed together.

In summary, we can conclude that as long as the productivity of labour grows at a higher rate than labour costs or as long as the ratio of these two remains below the corresponding figure of rival countries, changes in labour costs do not affect adversely the region's FDI potential.

TESTING THE IMPACT OF CAPITAL MARKET COMPETITIVENESS FACTORS ON CAPITAL INVESTMENTS

We applied a regression function to test the presumed effect of macroeconomic changes on inward FDI flows (Katona, 2009). The formula used in the linear regression test was as follows:

$$FDI = a_0 + \sum_{j=1}^{n} bjXjt + \sum_{j=1}^{m} gjZjt + e_t$$

Where X is the set of explanatory variables defined by the UNCTAD and Z is the set of specific variables that affects the attractiveness of Central and Eastern European economies. The survey encompassed the analysis of correlations between individual factors and working capital flows and, by excluding autocorrelation, examined the explanatory power of the entire model (i.e. all factors combined).

The databases of the OECD and the UNCTAD WIR helped identify and assess the volumes of affecting factors against an international benchmark. Only variables that were available in full for the entire period have been added to the model.
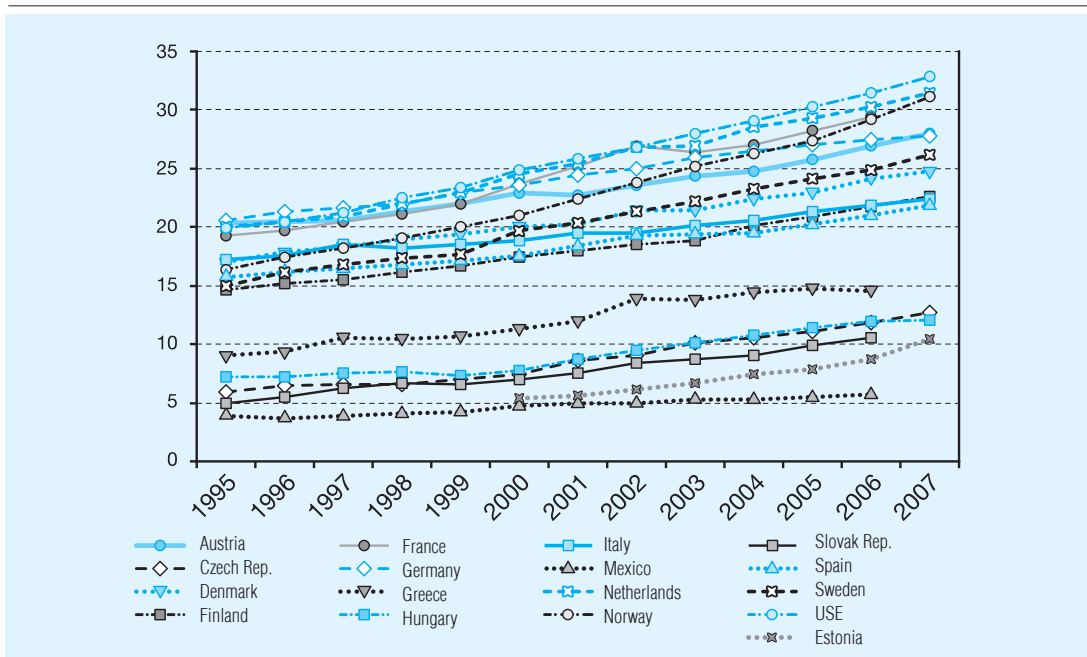
The explanatory variables reflect factors that characterise the country's competitiveness and the extent of economic policy interventions. They are as follows: market size, openness in trade, state of modern infrastructure, quality of human capital, cost of labour and tax rate.

The regression formula uses two working capital data sets among output variables. One set reflects short term effects and FDI changes in a year *(flow data)* while the other set *(stock data)* focuses on long-term effects (and the ability to retain working capital). The periods reviewed were 1995–2007 for FDI flow data and 2000–2007 for stock data.

The survey involved the following countries: Hungary, Czech Republic, Slovak Republic and

Chart 6

HOURLY WAGES IN THE ECONOMY, 1995–2007

(in USD and purchasing power parity)

Austria — France — Italy — Slovak Rep.
Czech Rep. — Germany — Mexico — Spain
Denmark — Greece — Netherlands — Sweden
Finland — Hungary — Norway — USE
— Estonia

Source: OECD (www.oecd.org)

Chart 7

YEAR-ON-YEAR PERCENTAGE CHANGE OF ULC IN CENTRAL AND EASTERN EUROPE AND THE EURO AREA

Czech Rep. — Estonia
Hungary — Slovenia
Poland — Euro area
Slovak Rep.
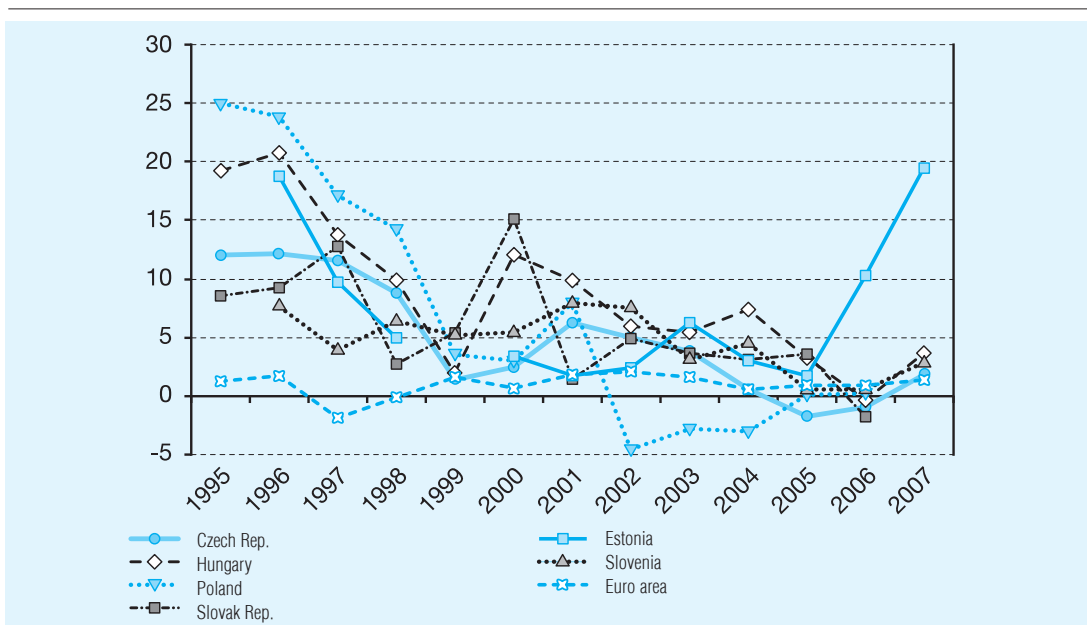
Source: OECD (www.oecd.org)

Poland. (Due to some missing labour cost data, Poland was not added to every model.) *(See Table 4)*

It is more efficient to assess regression test results by examining the combined effect of variables, i.e. if we project it to the entire model, as this is the only approach that excludes autocorrelation effects. With this approach, *three explanatory variables must be excluded from the model, for their excessive impact would overshadow the significance of other equally important factors. The three factors are as follows: volume of imports and exports and* *hourly wages which represent the cost of labour.* (Available data sets only enabled an impact analysis of labour costs for three countries: Hungary, Czech Republic, Slovak Republic). All three explanatory variables have so high explanatory power that they force the other factors out from the model. This fact alone would not call for their skipping in model analyses, but due to various reasons their revision is still necessary.

Regarding imports and exports, we may suspect that these are not explanatory but dependent variables, meaning that the growth of a coun-

Table 4

RESULTS OF REGRESSION TESTS PER EXPLANATORY VARIABLE

	FDI flow			FDI stock		
	Pearson correlation	**R2**	**sig**	**Pearson correlation**	**R2**	**sig**
Volume of imports (USD)	**0.825**	**0.681**	**0.000**	**0.980**	**0.961**	**0.000**
Volume of exports (USD)	**0.775**	**0.601**	**0.000**	**0.950**	**0.902**	**0.000**
Average hourly wage (at USD purchasing power parity)	**0.668**	**0.446**	**0.000**	**0.912**	**0.831**	**0.000**
Population (number of people)	**0.528**	**0.278**	**0.000**	**0.426**	**0.181**	**0.015**
Number of phone lines / capita (percentage)	**0.514**	**0.265**	**0.000**	**0.720**	**0.519**	**0.000**
Ratio of tertiary education graduates in total population (percentage)	**0.499**	**0.249**	**0.001**	**0.789**	**0.622**	**0.000**
GNI (at USD purchasing power parity)/capita (percentage)	**0.367**	**0.135**	**0.006**	**0.515**	**0.265**	**0.003**
GDP growth rate (percentage)	**0.350**	**0.123**	**0.015**	0.259	0.067	0.184
R+D expenditures/GDP (percentage)	0.063	0.004	0.659	0.269	0.072	0.143
Average taxes on wages (percentage)	−0.103	0.011	0.575	0.149	0.022	0.451
Revenues from income and profit tax /GDP (percentage)	−0.107	0.011	0.455	−0.006	0.000	0.977
Foreign trade / GDP (percentage)	*−0.283*	*0.080*	*0.042*	*−0.092*	*0.009*	*0.615*
GDP (at USD purchasing power parity)	*−0.327*	*0.107*	*0.014*	*−0.325*	*0.105*	*0.070*
ULC (percentage) (wages/added value of labour)	**−0.362**	**0.131**	**0.010**	**−0.576**	**0.332**	**0.001**
Social security contribution on wages (percentage)	**−0.387**	**0.150**	**0.003**	**−0.367**	**0.134**	**0.039**
Public spend on education (percentage)	*−0.390*	*0.152*	*0.044*	*−0.428*	*0.183*	*0.042*
Corporate tax rate (percentage)	**−0.405**	**0.164**	**0.002**	**−0.486**	**0.236**	**0.005**

Variables printed in bold: Significant at a 1 per cent significance level
Variables printed in italics: Significant at a 5 percent significance level
Variables in normal font: not significant

try's import and export performance is induced by FDI inflows and not the other way round and thus the direction of causality is just the opposite. While this very close, nearly deterministic correlation highlights many things, it does not help us understand the motivations behind foreign investor decisions.

The increase of labour costs has a positive (!) and very strong explanatory power regarding capital investment decisions which seems to contradict with the fundamental assumptions presented in technical literature.

At the same time, empirical findings could not confirm at all the assumed negative correlation between the cost of labour and FDI inflow which is considered all too obvious in theory. Empirical facts reflect a very mixed picture and encompass all kinds of effects from significant negative through neutral to significant positive correlation. Therefore, the increase of the cost of labour may even trigger a contrary response from investors and attract them instead of chasing them away. Several explanations are possible. Growing wages can generate a boom in capital intensive industries and thereby help capital inflows. This phenomenon is not really typical for FDI flows to the CEE region.

Second, the effect of labour cost cannot be separated from the productivity of labour. If the productivity of labour in the host country grows faster than labour costs, the country can remain attractive for capital investors. The lower the cost of labour per total output (approximated in our model with the ULC index), the more attractive the country is for investors. (As expected, the ULC index is a factor with negative or weak/medium effect in the regression equation but it does not help explain the whole of the model.)

Last but not least, *the cost and productivity of labour strongly correlates with the quality of workforce which is another decisive factor regarding inward FDI potential.*

The strong correlation identified in the regression model for the Central European Region mainly stems from this latter finding. In other words, it probably relates to the fact that the increase of wages reflects the region's economic convergence in the quality and cost of human capital.

If we remove the impact of these three factors from the model (the data set for Poland did not include the cost of labour anyway), the following correlations can be identified regarding FDI flow and stock volumes.

In all four countries, the telephone penetration index provides the most powerful explanation to the flow output variable which reflects the short term impact. This finding harmonises with the conclusion of a former analysis that was based on an extensive database. *Moosa – Cardac* (2003) tested the scope of the inward FDI potential index in an empirical research project that covered 140 countries. The survey found that two index elements, the number of telephone lines and the share of exports in the GDP showed a significant and consistent correlation to working capital influx everywhere. (Our analysis confirmed the impact of exports but the direction of causality is likely to be reverse in the other countries reviewed as well. This way, export growth is generated by FDI import and not the other way around.)

The number of phone lines per inhabitant which reflects the quality of modern infrastructure also appears among FDI stock data, but it only ranks third in respect of explanatory power. *In Central and Eastern Europe, the first and second most important factors behind long-term capital investment decisions are the ratio of tertiary education graduates to the total population and the corporate tax rate.* This result underlines the related statements of the survey which analyzed the motivators of FDI flows to Hungary up to 2003 and rendered a nearly deterministic significance to the growing ratio of tertiary education graduates in determining the FDI stock (Katona, 2007).

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CORRELATION OF MACROECONOMIC FACTORS TO COMPETITIVENESS AND PUBLIC SPENDING

We assumed the presence of two latent factors behind the 17 macroeconomic indices covered by the model. The first is the capital market competitiveness factor defined by the UNCTAD, the second is the role of government influence which technical literature considers important in Central and Eastern Europe. We tested the relation of explanatory factors to the individual components by way of a factor analysis. Results are presented below in *Table 5*.

Factors that are strongly related to the first component include average wages, telephone penetration, GDP per capita, productivity of labour, ratio of tertiary education graduates, R+D expenditures and the GDP growth rate. Without any simplification, it is fair to declare that these macroeconomic variables do contribute to the competitiveness of a country. The variables behind the second component are more interesting. The positive correlation between the second component and the ratio of social security contributions, the size of profit and income tax revenues and even R+D

expenditures seem to confirm the existence of government interference as a factor. The negative correlation to the GDP growth rate and the share of exports, however, is surprising but it does not prove wrong the the assumed latent structure.

Then we examined the impact of these two factors on foreign capital investments both in respect of FDI flow and FDI stock and came to an interesting but not surprising finding: *Both in the short and the long run, only the first component (competitiveness) has a significant positive influence on foreign capital investment decisions.*

SUMMARY

This study made an attempt to reveal the possible drivers of inward FDI potential in Central and Eastern Europe. In addition to the elements of the UNCTAD's internationally accepted inward FDI potential index, we reviewed how the factors that are deemed important in Central and Eastern Europe (tax rate, cost of labour) have changed in the past 10–15 years. The trends which individual

Table 5

RESULTS OF FACTOR ANALYSIS PER COMPONENT

	Component 1	Component 2
Average hourly wage (at USD purchasing power parity)	0.962	-0.114
Number of phone lines / inhabitant (percentage)	0.952	0.021
GNI (at USD purchasing power parity / capita (percentage)	0.888	-0.023
Ratio of tertiary education graduates in total population (percentage)	0.652	-0.057
R+D expenditures/GDP (percentage)	0.561	0.695
GDP growth rate (percentage)	0.508	-0.691
Revenues from income and profit tax /GDP (percentage)	0.426	0.837
Average tax burden on wages (percentage)	0.156	0.471
Social security contribution on wages (percentage)	0.013	0.936
Exports and imports / GDP (percentage)	-0.045	-0.871
Corporate tax (percentage)	-0.330	0.334
ULC (percentage)	-0.678	0.388

macroeconomic factors showed before and after EU accession were very similar in the countries concerned. EU integration had a positive effect on GDP growth in each country except Hungary. The openness of the region's economies in terms of foreign trade and the share of exports in the GDP were far above the respective OECD averages. With the exception of relatively large Poland, this openness continued to increase in the region after 2004. Telephone and internet penetration which represent modern infrastructure demonstrated dynamic growth in each surveyed country and enabled new member states to catch up with the average of developed countries. R+D spend as a percentage of the GDP lags behind the level required in EU and OECD countries – only Slovenia and the Czech Republic are close to the related average figures. Despite the significant growth recently, the ratio of tertiary education graduates in the total population fails to reach the 27 per cent level of OECD countries. Regarding country risk, there is hardly any difference in how the countries of the region are viewed by investors. Changes in tax policy, including corporate tax cuts were the most significant in Hungary until 2004 when Slovakia and Poland followed Hungary's example. By introducing flat tax, Slovakia, the Baltic states and Romania created the most favourable taxation environment for investors in the region. While wages in CEE countries do not differ significantly, tax and social security contribution charges levied on wages are 10 per cent higher in Hungary than elsewhere in the region. At the same time, the ULC index is roughly similar all over Central and Eastern Europe.

We applied a regression model to test the actual impact of the analysed macroeconomic factors on FDI decisions in the entire region. The outcome of the analysis pointed out that the improvement in the quality of human capital had a fundamental, decisive effect on foreign investment decisions not only in Hungary but in all CEE countries. Therefore, the individual countries in this region must focus on attracting products and services that have a high added value. This is the area where these countries can retain their competitive edge over other regions in the world in attracting FDI. What it also means is that the reduction of production costs and thus labour costs must not be primary objective. Instead, investment into a highly educated workforce can increase the region's attractiveness as a capital investment target.

At the same time, the quality of human capital is a decisive element of the latent component behind the explanatory variables of a country's competitiveness, and competitiveness is the factor that affects foreign capital investment decisions both in the short and the long run.

NOTE

[1] There are various approaches to capture the quality of human capital: number of students in primary education, in primary and secondary education, in secondary and tertiary education, only in tertiary education or in education in general, or their share in the total population. Each approach can be reasonable and interesting on its own. We have chosen the number of students in tertiary education because this variable is used in the UNCTAD model and because multinational companies often employ college graduates in positions where a lower education would also be sufficient as practically this is the segment of the workforce that speaks foreign languages.

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