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***How Changing Investment Climate Impacts on the Foreign Investors  
Investment Decision: Evidence from FDI in Germany***

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**Abstract**

In the paper we have analysed how the changing investment climate influences investment decisions of German investors. The basic idea of our concept is a treatment of investment climate conditions as a number of factors which negatively contribute to the foreign investors' decisions. Using statistics on FDI and aggregate indicators describing the institutional (level of corruption, protection of property rights) and macro-economical (foreign exchange rates and consumer prices dynamics) environment for the period from 1998 to 2005 we have examined the impact of the investment climate conditions on FDI inflows from Germany to the countries of BRIC, G8 and some members of EU. By controlling for FDI in BRIC countries we have shown that these states represent less attractive investment destinations for German FDI despite being viewed as the future's most promising economies. German investors still prefer exporting rather than investing in BRIC emerging markets.

*JEL* codes: D73, F21.

Key Words: Investment Climate, FDI, BRIC, G8.

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## 1. Introduction

There is a common opinion that the “good” investment climate increases the economic and financial performance of domestic companies as well as positively impacts on FDI [Venture: 2000, Hall and Jones: 1999]. According to this the governments of countries that wish to attract foreign investors gain recommendations to improve their institutional, political and regulatory environment. In order to decide what should be redesigned or improved or what is of particular importance for investors the government can use some investment climate indicators measured by international organizations such as Property Right Alliance, A.T. Kearney or Transparency International. Usually these measures are estimated from the point of view of experts or business persons focusing on broad indicators of a country risk, which results in a single score for each country. The dark side of the aggregate indicators is that they provide limited insight into how the investment climate affects firms’ investment decisions and which aspects of the investment climate are especially important. Application of national measures assumes also that the investment climate conditions are the same across locations. However, the aggregate indicators can be helpful for the policymaking.

In our paper we have examined the impact of the investment climate conditions in the countries of BRIC, G8 and some members of EU on investment decisions of German investors using statistical data on FDI and aggregate indicators for the period from 1998 to 2005. We have selected Germany as a source country of FDI because, first of all, Germany is the leading exporting country, and, second, it is the European biggest economy in terms of the gross domestic product. The first place in the list of the exporting countries means that German-based multinational enterprises (MNE) possess such valuable competitive advantages that allow them to penetrate successfully foreign markets, of which G8 and BRIC markets are the most important investment locations for the German investors. As of the end of 2005, G8 countries accounted for 50% of all German outward FDI while BRIC countries received only 4% [German Federal Statistical Agency: 2007]. We have also chosen the BRIC (Brazil, Russia, India, China) countries, as they are considered to be the most promising investment destinations in the future. In the contrast, G8 (USA, Canada, Japan, Italy, Germany, Russia, France, UK) countries are currently the leading economies (maybe except for Russia). Among the members of EU we analysed Holland, Austria, Belgium, Spain, Czech Republic, Poland, as well as countries included in G8 (France, Italy, UK).

The theoretical literature on FDI is very large with several strands. An important question is the one of location: when does it pay for a MNE to make FDI in a particular host country rather than to export? What country-specific factors determine intensity of FDI [Bevan and Estrin: 2000, Leahy and Montagna: 2000, Haaland, Wooton and Faggio: 2001, Hakkala: 2005]? What companies-specific properties provide the success of FDI in a foreign market? In terms of the Dunning’s OLI paradigm it is about two kinds of resources motivating FDI – ‘ownership’ advantages (company-specific assets that are costly to produce but easy to transfer across national boundaries e.g. R&D, technical and managerial know-how etc.) and ‘locational’

advantages (factors that make it profitable to operate abroad e.g. size of markets, lower foreign labour costs, special government investment supporting policies) [Taylor: 2008]. Moreover, there is significant theoretical and empirical literature on the instruments available to the government to encourage or to enhance benefits from FDI, for instance, through ‘tax competition’, investment incentives and subsidies or specifications on ‘local content rules’ which require that a foreign investor uses a certain amount of domestically manufactured inputs in producing its final output [Lahir and Ono: 1998]. In our paper we concentrate mainly on the country-specific ‘locational’ determinants of FDI which impact investment decisions of German investors.

## 1.1. Conceptual framework

When a company decides to expand into foreign markets through FDI, it starts with gathering all decision relevant information which is involved later in course of investment appraisal. Information is gathered only about those factors affecting by some ways an investor’s investment decision. Generally two groups of investment relevant factors can be distinguished: “positive” and “negative”. Positive factors are associated with the planned outcomes from an investment e.g. economic feasibility, expansion to new markets. They are opposed by negative factors derived from risks and uncertainty inherent to an investment due to specific macro-economic, institutional and political environment e.g. high inflation rate, weaknesses in the tax and law system, infrastructure problems. Positive factors used at calculation of NPV, ROI or EVA<sup>2</sup> or similar measures of an investment economic reasonableness are usually well quantified. Sometimes it might be hardly possible to forecast them accurately. Negative factors relate mainly to investment climate conditions and are often qualitative by nature. They can be implemented into an appraisal technique either by implying into the discount rate<sup>3</sup> or through charging of some extra expenses or incomes. For instance, corruption implies extra costs for a firm in the form of bribes, but it may also be cost-reducing, given that bribing leads to advantages such as a preferential tax treatment, reduced costs for licenses and permits or a faster handling of bureaucratic procedures [Hakkala: 2005]. For many negative factors it is tough to capture them into the cash flow forecast. They are accounted for implicitly by a decision maker, consequently, remaining beyond of the analysis.

To highlight the effects of negative factors we consider both positive and negative factors as those contributing to an investment decision. Assume that (a) an investor uses the investment appraisal technique that takes into account all positive and negative factors, and (b) an investment decision is only made, if both NPV is positive and ROI is more than the target ROI\*. Under these terms the probability that an investment decision is made is 100% in case the above conditions are met. Thus, all

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<sup>2</sup> NPV – net present value; ROI – return on investment, EVA – economic value added.

<sup>3</sup> As a rule, discount rate is equaled to the WACC. WACC depends finally on the risk-free rate, rate of debt and levered “beta”. The worse investment conditions, the higher the risk-free rate as well as the rate of debt.

effects of negative factors seem to be quantified and fully reflected in the discount rate applied or in the predicted expenses or incomes. Changing investment environment influences directly the economic measures (NPV, ROI) by pressing them in case of the worsening of institutional and political conditions.

Assume now that (c) only some of negative factors are fully or partially accounted for by the investment appraisal technique. This time the probability that an investment is approved is 100% only if (d) the ROI is in excess of ROI\* by “x”%. “x” is the compensation for the negatively contributing factors beyond evaluation by the investment appraisal technique. In fact, many multinational enterprises have developed an internal system of the country and industry-specific ROI (or similar investment reasonableness indicators) premiums (“x”) taking into account macro-economic, institutional and political risks of the proposed investment destination.

At the firm’s level the volume of FDI may be found, as follows:

$$FDI = FDI_{pot} \cdot P(AT(p/m, n/k), FC_{n-k+1}, \dots, FC_{n-1}, ROI^*, NPV) \quad (1)$$

where:

$FDI_{pot}$  – volume of FDI which would be made, if all investment relevant factors are fully assessed by investment appraisal technique (AT) and investment generates positive NPV and ROI is above the target;

P – probability of investment decision;

AT – investment appraisal technique making allowance for ‘p’ of ‘m’ positive factors and ‘n’ of ‘k’ negative factors;

FC – contribution of negatively impacting factors not accounted for by the appraisal technique AT;

ROI\* – targeted ROI;

NPV – positive NPV.

Contribution of negative factors depends among others on the degree of problems related to the factor from the investor’s point of view. We define the degree of problems which investor faces as the factor’s quality. The worse the factor quality, the more attention is paid to this factor by this investor, the more negatively it contributes to the investment decision. It is followed from the one-sector Ramses growth model postulating that the ROI under the “good” investment climate conditions will be higher in comparison to the “bad” ones.

Thus, the way by means of which investment decisions are affected by the various institutional, political and macro-economic conditions depends on how “good” or “bad” investment conditions are, as well as how the investment relevant information on the micro- and macro-environment is gathered and what techniques (AT) are used to appraise investment decisions.

## 2. Econometric Model

For the purposes of the regression analysis of FDI flows from Germany to the countries of BRIC, G8 and selected EU countries within the period from 1998 to 2005 expression (1) is added by aggregate indicators measuring country’s macro-economic and institutional environment:

$$\text{FDI} = \alpha_0 + \alpha_1\text{GDP} + \alpha_2\text{exp}(se) + \alpha_3\text{CPI} + \alpha_4\text{exp}(\text{CI}) + \alpha_5\text{IPR} + \alpha_6\text{FX} + \alpha_7\pi + \alpha_8\text{exp}(\Delta r) + \text{EMC} + \text{BRIC} \quad (2)$$

where:

GDP – host country's gross domestic product [in thousand of USD] measures typically the market size and captures potential economies of large scale production. FDI and GDP are expected to grow in the same line;

se - the share of German export in the host country's gross domestic product indicates the competitive advantages of the German investors compared to host domestic producers. If the demand on the foreign market is enough and stable over the time, German investors may use their competitive advantages by locating production in the host country. The OLI paradigm developed by Dunning [1974, 1980] suggests, that as trade becomes concentrated in goods produced by firms using knowledge-intensive aspects, FDI will gradually replace exports [Bevan and Estrin: 2000]. If it is the case, FDI and the share of German export in GDP should be negatively related;

CPI – Corruption Perceptions Index [0...10; 0 – the worst] ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians. It is a composite index, a poll of polls, drawing on corruption-related data from expert and business surveys carried out by a variety of independent and reputable institutions. It is inverted as (10-CPI) [0...10; 10 – the worst] in order to derive measures which increase in corruption [Hakkala: 2005];

CI – FDI Confidence Index [0...3; 3 – the investment is most likely] measured by American consulting agency A.T. Kearney by surveying CEOs, CFOs and other key decision-makers of the world's largest 1,000 firms about their opinion of various FDI destinations and their investment intentions;

IPR – International Property Rights Index (IPRI) [0...10; 0 – the worst] designed by American Property Right Alliance is the first international comparative measure of the significance of both physical and intellectual property rights and their protection for economic well-being. The monopolistic advantage theory postulates that the driving force for the horizontal FDI is the superior knowledge possessed by a foreign investor. Having in mind this idea it may be expected that the worse the system of the protection of intellectual property rights is, the lower are the horizontal FDI. As CPI, IPR was inverted as (10-IPR) [0...10; 10 – the worst];

FX – change in the foreign currency rate against the euro. Increase in the nominal value of a foreign currency (e.g. from 30 Russian Rubles/Euro to 35 Russian Rubles/Euro) effectively means depreciation of that foreign currency against the euro. It stresses ROI expected from an investment decreasing inward FDI to the host country. Hence, increase in the nominal spot rate of a foreign currency should reduce German FDI;

EMU – [1] if a country is the member of the European Monetary Union, [0] – otherwise. Since the introduction of the euro in 2002 the variable FX is no longer relevant for the countries of the European Monetary Union among which France, Italy, Spain, Belgium and Holland have been considered in our paper;

$\pi$  – annual average year on year change in consumer prices in percent;

BRIC – regional 'dummy' variable to indicate the countries of BRIC.

Moreover, we have decided to validate the expository power of the conventional investment portfolio theory explaining international capital movements by the existence of the interest rates spread. As the previous studies have proved that the interest rate spread is not the determinative and significant factor of FDI, it should not be important for our sample as well. As the basis for the country's interest rate we took the rate of return gained by the country's leading stock exchange index (e.g. DAX in Germany). In other words, if DAX valued to 6000 in 2002 and to 6600 in 2003 (both figures - average), the interest rate applied to Germany (as a source country of FDI) in 2003 totaled to 10% ( $=600/6000$ ).

## 2.1. Empirical Estimations

In order to assess the country-specific factors of FDI we assembled a large panel of dataset covering the period from 1998 till and including 2005. Statistics on FDI were extracted from the Annual Reports published by the German Federal Statistical Agency (Statistisches Bundesamt), as well as from the database prepared by the German Federal Central Bank (Deutsche Bundesbank). Data on the aggregate indicators describing investment climate conditions were uploaded from the internet resources of the respective agencies, for instance, Corruption Perceptions Index – from the site of Transparency International, International Property Rights Index – from the site of Property Right Alliance.

At the first stage of our analysis we estimated expression (2).

As can be seen, the parameter upon gross domestic product is positive and significant, which confirms the hypothesis that the size of a foreign market encourages investments.

As expected, FDI is negatively related to the share of German export in the host gross domestic product proving our assumption that in the course of time export is replaced by FDI.

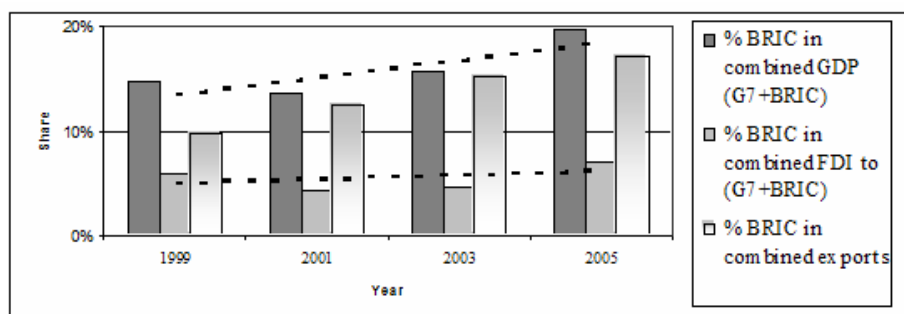
FDI Confidence Index estimated by AT Kearney is significant in all scenarios considered. Therefore, it may be recognized as a reliable measure of the volume of inward FDI.

At the first sight, it appears to be surprising that our BRIC variable is negative and highly significant indicating that *ceteris paribus* BRIC countries account for less FDI compared to G8 or selected EU countries (scenario II). On the other hand, it is quite easy to explain: all BRIC countries are emerging markets. German companies have lack of experience in carrying of business on these markets and this restrains investments. The graph on the next page once more shows the effect of BRIC. While the share of BRIC countries in combined GDP increased rapidly to 20% in 2005 from 15% in 1999, the share of BRIC countries in the stock of German FDI amounted to 7% only in 2005 compared to 6% in 1999. Remarkable that for the same period the share of BRIC countries in the totaled exports sprang to 17% in 2005 from 10% in 1999. It demonstrates that German investors still prefer exporting rather than investing in BRIC countries.

As followed from Scenario III, the Transparency International Corruption Perception Index is positive and significant at 5% illustrating that the higher

corruption reduces investments. Adding Corruption Perception Index makes the export share factor insignificant. It becomes significant again, if we consider CPI Index for the emerging markets (BRIC) only (scenario IV). CPI Index as well as International Property Rights Index cease to be significant, if we control the foreign exchange rates and consumer price dynamics (scenario V). Despite the both institutional environment indicators have negative sign that meets our expectations.

**Graph 1: Relative share of BRIC countries in the combined GDP, FDI flows and German export**



**Table 1: Estimations of (2)**

Dependent variables	Basic specification	BRIC	CPI	CPI · BRIC
Scenario	I	II	III	IV
GDP	0.0009** (0.0005)	0.0005 (0.0005)	0.00064 (0.00048)	0.0005 (0.0005)
exp(se)	-4380* (2542)	-5694** (2592)	-2534 (2732)	-5556** (2585)
exp(CI)	1710** (788)	2626*** (898)	2240*** (838)	2555*** (890)
CPI	-	-	-850** (484)	-
CPI · BRIC	-	-	-	-748** (380)
BRIC	-	-5440** (2655)	-	-
No. of observations	131	131	131	131
Multiple R	0.35	0.39	0.38	0.38
R2	0.12	0.15	0.14	0.15

Note: Standard errors in parenthesis; \* - significant at 10%; \*\* - significant at 5%; \*\*\* - significant at 1%.



In Scenario VI we presented the influence of macro-economic environment indicators on FDI (Table 2 below). Predictably the depreciation of foreign currency against the euro impaired FDI. Unusual is the positive and significant parameter upon the percentage annual average year on year changes in consumer prices. One possible explanation might be that the parameter upon the foreign exchange (FX) is overstated. In this case the positive sign upon the consumer price dynamics ( $\pi$ ) partially compensates the negative pressure on FDI caused by devaluation of foreign currency. In fact, the purchasing power parity theorem says that a foreign currency depreciates, if the host country's rate of inflation is over the source country one. Given that fact, the variables 'FX' and ' $\pi$ ' are not independent and accordingly influence the results of the regression analysis.

**Table 2: Estimations of (2)**

Dependent variables	IPRI	Inflation and foreign exchange rate	Interest rate spread	FDI <sub>t-1</sub>
Scenario	V	VI	VII	VIII
GDP	0.0007 (0.0006)	0.00065 (0.00055)	0.0001 (0.0006)	0.0005 (0.0005)
FDI <sub>t-1</sub>	-	-	-	0.30*** (0.10)
exp(CI)	3150*** (1060)	3140*** (1052)	5855*** (1501)	1660* (996)
CPI	-198 (1388)	-246 (808)	-613 (790)	-2602 (2106)
IPR	-144 (2390)	-	-	-
BRIC (China only in VII)	-4840 (4156)	-5154 (4370)	-18560** (7596)	-1222 (3078)
$\pi$	492** (238)	490** (232)	-	-
FX	-222** (107)	-224** (107)	-661*** (212)	-53 (68)
EMU	-	-712 (3058)	1654 (2872)	-
exp( $\Delta r$ )	-	-	385 (7372)	-
No. of observations	108	108	95	114
Multiple R	0.45	0.45	0.56	0.48
R2	0.20	0.20	0.31	0.23

Note: Standard errors in parenthesis; \* - significant at 10%; \*\* - significant at 5%; \*\*\* - significant at 1%.

Expectedly, the interest rate spread is positive but not significant factor affecting FDI (scenario VII).

Notable is Scenario VIII, where we have implemented autoregression to investigate FDI:

$$FDI_t = \gamma_0 + \gamma_1 FDI_{t-1}.$$

As we can see, FDI in the year  $t$  is positively depending on FDI in the previous year  $t-1$ .  $\gamma_1$  is significant at 1% and describes what share of previous investments will induce the current investment volume (in our case it amounted to 30%). The existence of intertemporal relationship acknowledges that the investing process is inertial by nature meaning that investments commenced in the year  $t$  are usually being performed during some years.

### 3. Conclusions

The analysis presented in this work has shown the effects of some macro-economic (foreign exchange rates and consumer prices dynamics) and institutional (level of corruption, protection of property rights) conditions, as well as so called 'positive factors' (host country gross domestic product, investors intention to invest, interest rate spread) proxied by several aggregate indicators measured by international organizations, on investment decisions of German investors. Our empirical analysis focused primarily on German FDI in the countries of BRIC, G8 and some EU countries. BRIC and G8 countries were specially selected to compare investment features of the today's most developed economies and the future promising investment locations.

Regarding BRIC countries it has been identified that they receive less German FDI, than it would be expected given all other contributory factors (BRIC variable is negative and significant). For the period from 1998 to 2005 Brazil, Russia, India and China attracted only 4% of German aggregated investments to both BRIC and G7 (except for Russia) countries, provided that BRIC states produced 15% and 20% of GDP in 1999 and 2005, respectively. Consequently, German corporations still opt exporting instead of investing when they are going to penetrate the BRIC emerging markets.

Among institutional indicators we concentrated on these measuring corruption and protection of physical and intellectual property rights. The latter was chosen, as we assumed that the horizontal FDI driven by knowledge superior or R&D should be highly sensitive to the host country system of intellectual property rights protection. This was not the case, because despite the expected negative relation to FDI the level of significance upon the International Property Rights Index was not satisfactory. Applying Corruption Perception Index we confirmed corruption to be detrimental for investments.

Despite the fact that the conventional investment portfolio theory regarding FDI was cast back, we have decided to examine its explanatory power once more. As predicted, FDI are not sensitive to the spread of ROI proxied for the purposes of our analysis by excess of the return of host country's stock exchange index over the German stock index DAX.

Finally, we have investigated how FDI is influenced by investment decisions made in the past. We have discovered that previous investments considerably affect the level of current FDI to the countries of BRIC, G8 and selected EU countries. It contributed to the point of view that investments performed in the current period have some fixed items carried forward.

Hence, changing investment climate influences investment decisions over the time lag. The investor needs that time to be aware of and to adapt for changed investment conditions and after that to review its investment decisions. Once previous and current decisions have been revised, the changing investment climate finally impacts the behavior of investors.

## References

Bevan,A. – Estrin,S. (2000), ‘The Determinants of Foreign Direct Investments in Transition Economies’, Centre for New and Emerging Markets, London Business School, William Davidson Working paper No. 342.

Dunning,J.H. (1980), ‘The Location of Foreign Direct Investment Activity, Country Characteristics and Experience Effects’, *Journal of International Business Studies*: 9-22.

Haaland,J. – Wooton,I. – Faggio,G. (2001), ‘Multinational Firms: Easy Come, Easy Go?’, *Finanzarchiv*, **volume 59 number 1**:3-26.

Hakkala,K. – Norbäck,P-J. – Svaleryd,H. (2005), ‘Asymmetric Effects of Corruption on FDI: Evidence from Swedish Multinational Firms’, The Research Institute of Industrial Economics, Working Paper No. 641.

Hall,R. – Jones,C. (1999), ‘Why Do Some Countries Produce So Much More Output per Worker than Others’, *Quarterly Journal of Economics*, **volume 114 number 1 February**: 83-116.

Kotov, D. (2006), ‘An investigation of foreign direct investment intensity between Russia and Germany: research proposal’, ‘III Intellectual technologies in education, economy and management’, International scientific conference, **December**: 6-7.

Lahir,S. – Ono,Y. (1998), ‘Foreign Direct Investments, Local Content Requirement and Profit Taxation’, *Economic Journal*, **volume 108**: 444-457.

Leahy,D. – Montagna,C. (2000), ‘Unionization and Foreign Direct Investments: Challenging Conventional Wisdom?’, *Economic Journal*, **volume 110**: C80-C92.

Smith,W. - Hallward-Driemeier,M. (2005), ‘Understanding the Investment Climate’, *Finance & Development*, **March**:40-43.

Taylor,C. (2008), 'Foreign Direct Investments and the Euro: the First Five Years', *Cambridge Journal of Economics*, **volume 32 number 1**:1-28.

Venture,J. (1997), 'Growth and Interdependence', *Quarterly Journal of Economics*, **volume 112 number 1 February**:57-84.

'International Trade and Foreign Direct Investments' in: *International Encyclopedia of Business and Management* (1998), Edited by Malcom Wagner, London, New York. Volume 3: 2339-2354.