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Identification and Measurement of Relationships Concerning Inflow of FDI: The Case of the Czech Republic

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Identification and Measurement of Relationships Concerning Inflow of FDI: The Case of the Czech Republic

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Abstract

The main goal of the paper is to obtain quantitative evidence describing determinants of FDI in the case of the Czech economy in order to empirically support the decision-making process within the Czech National Bank. The paper builds on the recent economic literature and at the same time examines FDI inflows from the perspective of a multinational company. Furthermore, the microeconomic and macroeconomic characteristics of a potential host country which are crucial for multinational companies' investment decisions are examined. Since government investment incentives seem to play a role in attracting foreign direct investors the paper provides some details on the Czech economic environment regarding this issue. To reach those objectives a cointegration analysis and error-correction model is used to identify the most important determinants of FDI inflows in the Czech Republic by developing an econometric model for analytic purposes. The empirical results presented in the paper support the hypothesis that the most significant determinants of FDI inflow into the Czech economy correspond to the theoretically considered and empirically tested factors. The paper, therefore, provides some basis for analysing the character of foreign investment and assessing the role of the government in attracting FDI inflows to the Czech Republic. More specifically, the empirical results suggest that establishing and maintaining macroeconomic stability and external equilibrium, offering a consistent and competitive package of investment incentives and promotion, and an efficient financing infrastructure, public governance regime and social system are the key factors promoting foreign direct investment inflows.

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Nontechnical Summary

Foreign direct investment has played an important role in the transition process and economic development of the Czech Republic. Understanding all the relations and implications of inward FDI from a qualitative and quantitative point of view is crucial for the design of well-founded monetary policy decisions. Thus, the main objective of this paper is to deepen our knowledge and experience in the field of open-economy macroeconomics related to foreign direct investment. The ultimate goal of the project is to obtain quantitative evidence in terms of econometric results describing the determinants of FDI in the case of the Czech economy in order to empirically support the decision-making process within the Czech National Bank.

In order to do that, the paper examines the theoretical and empirical literature to identify possible factors explaining the behaviour of foreign direct investment in the Czech case over the last decade. An exploration of the motivation to invest abroad from the perspective of a multinational company is the starting point of the analysis. Furthermore, the microeconomic and macroeconomic characteristics of a potential host country which are crucial for multinational companies' investment decisions are examined. Since government investment incentives seem to play a role in attracting foreign direct investors, the paper provides some details on the Czech economic environment regarding this issue. To obtain specific empirical results, cointegration analysis and an error-correction model are used to identify the most important determinants of FDI inflows into the Czech Republic. The final econometric results are used for analytical interpretation of past FDI development and for drawing up some policy recommendations for the future.

The conclusions presented in the paper suggest that inward FDI coming to the Czech Republic has been prevailingly of a vertical (export-oriented) character. Accordingly, multinational companies have considered the Czech Republic as a potential destination for their foreign affiliates, focusing on its comparative (dis)advantage in terms of input prices, government promotion of FDI and economic vulnerability. Based on this, the recommendation for the government if it wishes to accelerate the FDI inflow is to establish and maintain overall macroeconomic stability and external equilibrium. From the government's point of view, a consistent and competitive package of investment incentives is another effective means of promoting inward FDI, according to the results of the paper. A high-quality infrastructure, well-functioning public governance, an efficient legal and regulatory framework, and social cohesion are also necessary preconditions for any country to successfully compete for inward FDI, as suggested by the Czech evidence provided in the paper.

1. Introduction

Foreign direct investment (FDI) has played an important role in the transition process and economic development of the Czech Republic.[1] For example, from the monetary policy perspective, the behaviour of inward FDI and its influence on the foreign exchange market and the balance of payments (BOP) have to be taken into account. In other words, assessing the short-run impact of inward FDI on the volatility of the various components of domestic demand and the near-term response of economic activity to the inflow of FDI is important for the monetary authorities in the process of stabilising the economy by means of MP instruments. Finally, an understanding of the implications of the long-run supply side effects of inward FDI on the potential or non-accelerating inflation product (or rate of unemployment) from a qualitative and quantitative point of view is crucial for the design of well-founded monetary policy decisions.

Thus, the main objective of this paper is to deepen our knowledge and experience in the field of open-economy macroeconomics related to foreign direct investment. The ultimate goal of the project is to obtain quantitative evidence in terms of econometric estimation results describing the determinants of FDI in the case of the Czech economy.

The paper is organised as follows. Section 2 considers some underlying theory and the main determinants of FDI flows throughout the world. Section 3 provides an empirical analysis of the determinants of FDI inflow into the Czech economy, consisting of formulating the basic hypotheses, describing the data used, specifying the econometric methodology, and estimating the equations. The final section summarises the empirical results and provides overall conclusions and implications.

2. Determinants of Inward FDI – Underlying Theory

The theory of worldwide FDI flows tries to resolve two types of issues. First, it examines the reasons and incentives that motivate companies to invest abroad and shift their production to a foreign country.[2] Second, it explores relevant microeconomic and macroeconomic characteristics of a potential host country that might play a key role for multinational companies (MNCs) when making a choice among suitable locations for a foreign subsidiary or branch. As we will argue

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[1] Generally, FDI reflects the objective of a resident entity in one economy to obtain a lasting interest in an enterprise resident in another economy. In line with international standards (IMF/OECD) a "10% ownership criterion" should be applied to infer the existence of a lasting interest. The components of direct investment transactions are equity capital, reinvested earnings and other capital associated with various inter-company debt transactions [ECB, 2002].

[2] In this respect we should define all the possible ways through which inflow of FDI may happen. Firstly, there are mergers and acquisitions directly connected with privatisation processes, taking place mainly in the former centrally planned CEE economies. Secondly, there are private mergers and acquisitions, defined as a change of assets from domestic to foreign entities, in the form of selling shares to a new foreign owner or using other financial schemes to create new firms, e.g. "joint ventures", or subsidiaries and branches. Such activities, at least initially, do not all usually add to the productive capacity of the recipient economies. And thirdly, only a part of those newly created firms (JVs and affiliates) arise via the building of new production capacities in an open area ("greenfield projects") or via the installation of new technology in existing premises ("brownfield projects").

later in the text, government investment incentives and promotion may play a specific role in the competition among countries to attract inward FDI.

2.1 General Theory of a Multinational Company and Distinguishing Types of FDI Activities

There are two main reasons for FDI activities. The first is to compete on a local market in a foreign country more successfully, and the second is to gain cheaper inputs. The literature covering this topic concludes that multinational companies arise "from a combination of industrial organisation motives that result in a number of activities being placed under common ownership and control, and comparative advantage reasons that cause these activities to be placed in separate countries" [Holland, Pain 1998, p. 1]. The motives of industrial organisations are closely related to internalisation theory and transaction costs in the development of foreign operations. A multinational company can select one of three possible ways to co-ordinate economic agents spread out worldwide, i.e. by means of internalisation of transactions within a single institution, via establishing an international firm.[3] Thus, the multinational company is established as a response to market failures, as a way to increase allocative efficiency in the presence of high costs of co-ordinating economic activity between independent economic agents [Blomström, Kokko, 2003].

As stated in [Lim, 2001], three main conditions must be fulfilled for a firm to conduct FDI activities successfully. First, the firm must be the owner of a "firm-specific knowledge-based tangible or intangible asset". This allows the firm to beat other firms (ownership advantage), otherwise it would not be able to overcome the additional costs associated with producing in a foreign country. Second, from the firm's point of view, using such an asset is more advantageous than selling or leasing it (internalisation). Third, using such an asset is more beneficial when combined with at least some factor inputs located in a foreign country (location advantage).

According to the prevailing motivation for a company to become multinational, we can distinguish two basic types of FDI activities [see, for example, Slaughter, 2002]. The first type, denoting FDI designed to serve local markets, is often called "horizontal" or "market-seeking" or "tariff-hopping" FDI. This means creating similar capacities in a foreign country in order to supply the local market, with the aim of decreasing the costs associated with supplying the market from abroad (e.g. to avoid tariffs and transport costs). The other reason for horizontal FDI is the effort of an MNC to become more competitive through geographical and non-geographical proximity to the local market and by means of better understanding of local preferences, conditions, etc. As such, "horizontal FDI will tend to replace exports from the home market of the MNC if the costs of market access through exports (tariffs and transport costs) are higher than the net costs of setting up a local plant and doing business in a foreign environment" [Lim, 2001, p. 11].

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[3] The two remaining ways are (i) decentralised decision-making and transactions using the price mechanism and (ii) contractual agreements. However, the price mechanism has costs that may (if the contracted commodity is information in the form of technological and organisational know-how) be very high or even prohibitive.

The second type of FDI, often referred to as "vertical" or "production-costs minimising" FDI, consists in slicing the vertical division of the technological process and removing part of the procedures to a low-cost country in order to gain cheaper factor inputs.[4] The inexpensive inputs may be primary commodities or raw materials, or the project may seek other types of inputs, such as labour, human capital, intermediate goods, or access to certain externalities.

Vertical FDI tends to be export-oriented, frequently to the home market of the MNC making this FDI. And, consequently, this type of FDI does not seem to be influenced by the recipient country's market size.

There is a phenomenon referred to as the "clustering" or "agglomeration effect" which horizontal and vertical FDI have in common. This means that FDI may show a tendency to cluster in a particular locality because of linkages among projects creating incentives for a subsidiary or branch of an MNC to be established in the vicinity of other firms. Moreover, clusters may arise if firms exhibit "herd behaviour", with some of them applying the "follow-the-leader" strategy and waiting for the successful results of the first FDI-related firms to confirm a good investment climate and general conditions in the host country.

2.2 Microeconomic and Macroeconomic Characteristics of the Host Country

After the decision to set up a subsidiary or branch in a foreign country has been made, the company seeks a suitable location for its investment. The specific type of FDI activity substantially affects this key process. Thus, the power of each particular microeconomic and macroeconomic characteristic may sometimes differ depending on what type of FDI the country is going to receive [Lim, 2001].

Generally speaking, it is obvious that the strength of FDI inflow and the FDI stock resulting from it in a given country is positively related to factors such as overall political stability and the ability of the host country to protect human and property rights. Beyond these, there are several other specific factors affecting the decision of the MNC. Some of these will be the subject of the empirical examination regarding the Czech Republic in section 3 of this paper.

- **Host country market size**: As one would expect, horizontal FDI seems to be affected by this factor to a substantial extent. Conversely, vertical FDI is indifferent to the size of the country (due to its export orientation). The possible influence of the market size of the Czech economy measured in terms of GDP, along with other factors, will be examined in the empirical section of this paper in order to reveal the prevailing pattern of the inward FDI in the Czech Republic.
- **Clustering effects**: Both horizontal and vertical FDI seem to be positively influenced by these effects. The key factors that may contribute to agglomeration effects are the following:
  - the infrastructure of the host country;
  - the extent of industrialisation;
  - the volume of the existing FDI stock.

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[4] This strict dichotomy concerning the two types of FDI activities is, of course, only of a theoretical pattern. In reality, these types are not mutually exclusive within one single project.

The last-mentioned will be used in the empirical exploration below to decide whether incoming FDI is affected by these clustering effects in the Czech Republic as well.

- **Factor costs (especially labour and human capital costs)**: As stated above, vertical FDI searches for low-cost locations to establish new production facilities. However, not only price, but also the quality, availability and productivity of production factors in each country have to be taken into account. The international competitiveness of the Czech Republic in terms of factor costs (unit labour costs) and their influence on FDI inflow will also be the subject of econometric analysis in the empirical part of this paper.

- **Government investment incentives and promotion**: The next subsection will be dedicated solely to this factor in detail.

- **Riskiness and macroeconomic stability:** The location of FDI is affected by risk perceptions. A stable political and macroeconomic environment is one of the most important preconditions for any country that desires to become a location for a foreign subsidiary of an MNC. However, it is difficult to measure risk perception, especially if there is a need for time-varying figures for statistical evaluation. At the macroeconomic level there are several widely used indicators that can be employed – exchange rate stability, inflation and its volatility, and measures of external stability such as debt/GDP ratio or CA/GDP ratio. The last-mentioned variable will be used in the empirical analyses for the Czech Republic.

- **State interference in the economy**: A prohibitively high tax burden, large subsidies and a high share of state-owned enterprises are perceived very negatively by foreign investors, as they increase uncertainty and inequalities in the host country market. On the contrary, providing and maintaining social cohesion, a high quality infrastructure and efficient public governance via public expenditure may be a relevant factor in attracting inward FDI. Therefore, the effects of the public activities of the Czech government on FDI inflow will be explored in this study as well.

- **Transport costs and economic distance**: In the case of horizontal FDI, this factor is of great relevance, as high transport costs and large economic distance may encourage horizontal FDI to avoid additional export-related costs. Conversely, an outlying country does not tend to be a suitable location for the vertical type of FDI because of its export orientation and worldwide interoperability. Because of its relevance for cross-sectional analysis only, the distance of the Czech Republic from its FDI home countries will not be examined in the econometric analysis later on. The remaining theoretically relevant factors below will not be included in the empirical exploration either, owing to a lack of reliable data suitable for statistical procedures in the case of the Czech Republic.

- **Privatisation**: Especially in transition countries, the privatisation process undertaken by their governments has been a strong incentive for strategic FDI. This act is understood by worldwide investors as a signal of commitment to private ownership, and it simultaneously provides governments with some control over the direction, volume and timing of capital movements [Holland, Pain, 1998]. Unfortunately, we do not have precise data on privatisation-related FDI in the required quality and frequency to explore the influence of this factor in the case of the Czech Republic.[5]

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[5] On the problems with the Czech FDI data in the 1990s, see, for example, [Benáček, 2000].

- **Business/investment climate**: Effective protection of property rights, easy enforceability of contracts, transparent and adequate labour regulations, and small regulatory, bureaucratic and judicial hurdles seem to attract both vertical and horizontal FDI. On the contrary, local content requirements, mandatory joint venture partnerships, and obstacles to transferring profits abroad would make a potential country less attractive for both types of FDI [Lim, 2001].

- **Trade barriers/openness**: "Investors prefer countries with relatively liberal trade regimes, possibly within regions with wider supra-national free trade agreements" [Holland, Pain, 1998, p. 9]. This is presumably the case with vertical FDIs, which are basically dependent on substantial flows of inputs across the borders of the host country. As a consequence, investors prefer a liberal and predictable trade regime. However, there are views claiming that horizontal FDI designed to overcome trade barriers ("tariff-hopping") may be negatively influenced by an increase in openness [Lim, 2001].

- **Regional integration**: A purely theoretical, rather stationary approach based on the prevailing motivation for horizontal and/or vertical FDI activities claims that regional integration leads to a decrease in intra-regional horizontal FDI flows, whereas vertical FDI within the region may be encouraged by this fact. As regards inter-regional FDI, both vertical and horizontal inward investment seems to be attracted by a higher degree of regional integration. Besides that, there are several additional dynamic effects of regional integration that are rather time-consuming. Nevertheless, they also in the end lead to a more massive FDI inflow into countries that participate in the integration process. However, there mixed results and opinions about the possible positive effects of the EU accession of the CEE countries on their inward FDI. [Barry, 2002], for example, demonstrates by means of the favourable Irish experience that CEE countries may expect a rapid increase in FDI inflow after EU accession and enjoy subsequent positive structural and technological changes leading to fast catching-up effects.[6] On the contrary, [Görg, Greenaway, 2002] using their results based on gravity modelling claim that CEE countries cannot expect substantial growth of FDI inflow from the UK into their manufacturing industries after their EU accession, and only slight growth of inward FDI in services.

  As regards the Czech Republic, our view regarding inward FDI after EU accession is somewhere between these two poles. We cannot expect such a dramatic positive change in foreign investors' perception of our country as that experienced by Ireland, as the Irish economy enjoyed extraordinarily favourable circumstances.[7] On the other hand, although the investment community has been expecting our EU entry for several years, the existing scheme of a free trade agreement and association treaty is not considered to be equivalent to full EU accession with adoption of the acquis communautaire and the Single Market Programme rules. Therefore, there is, in our opinion, some space for a rather stronger FDI inflow after the

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[6] Moreover, "EU membership today is a much stronger guarantee of a transparent legal and business environment than it was at the time of Ireland's EU entry because of the development of the legal and institutional framework of the EU, the *acquis communautaire*" [Barry, 2002, p. 10].

[7] It is accepted that a combination of an English-language environment, a very efficient agency promoting FDI inflow, a high number of managers of U.S. companies of Irish origin and an orientation on R&D and a knowledge-based economy contributed to the very strong acceleration of FDI inflow in the Irish case after its EU accession.

Czech Republic becomes an EU member than that which we have observed in recent years. However, the Irish experience will be hard to follow.

- **Law and order, legal and regulatory framework and efficient public governance**: The influence of this factor is obvious.

- **Proximity to potential FDI source countries**: Foreign investors prefer to establish their new affiliates in countries that are similar to their own home country. For example, the English-language environment in Ireland is classified as the third most important factor underlying Ireland's success in the field of FDI inflow, after its well-educated labour force and advantageous corporate income tax rate [Barry, 2002].

2.3 Government Investment Incentives and Promotion

As stated above, government investment incentives and promotion (GIIP) are among the most important characteristics of a potential host country and occupy a special position among them. However, until recently, investment incentives were considered a relatively peripheral determinant of FDI, which was prevailingly regarded as horizontal FDI. For this reason, basic economic fundamentals such as market size, income and trade policies, infrastructure, etc. were recognised to be of greatest relevance to an MNC establishing a new foreign facility to serve a local market.

However, this opinion has been changing in recent years. This turning point can be derived from the fact that GIIP have spread massively since the mid-1990s. Consequently, very strong competition among countries in the field of GIIP has emerged in the last decade. Moreover, unilateral abolition of GIIP is considered to have significant costs in terms of positive spillovers because of the lasting impacts of initial FDI inflow on further FDI through agglomeration/clustering effects [Pain, 2002].

Surprisingly, GIIP are more common in developed countries than in developing ones and their increasing importance for decision-making is documented both by MNC executives in surveys and by econometric studies, particularly in the case of fiscal preferences [Blomström, Kokko, 2003]. The reason lies in the internalisation of the world economy. This leads to the fact that smaller economies are now allowed to compete for FDI that previously went automatically to the big markets.

It is hard to quantify whether GIIP yield benefits larger than costs because of the time lag between the moment of granting GIIP and the future period of reaping the benefits from FDI activities and the ensuing processes (if there are any), let alone the case where the investor is footloose and can easily move on to other destinations offering even more advantageous GIIP before the expected gains in the former location have occurred.

Generally, GIIP are justified if MNCs differ from local firms by having firm-specific knowledge-based assets and if there are productivity spillovers to local firms. Then GIIP can bridge the gap between social and private return, avoiding a scenario where FDI would drop below its social-optimal level if the GIIP were not offered. On the other hand, there should be no GIIP for firms

that do not own any specific assets, since such firms' incentive to invest is purely linked to GIIP (otherwise these enterprises would not be able to compete with domestic firms).[8]

In this context, the best policy to follow is probably to design the GIIP so as to induce positive externalities and hence improve the ability of local firms to learn and absorb foreign technologies and skills. GIIP should be considered as a part of a policy that promotes innovation and growth of the overall economy rather than a policy instrument that is available only to foreign investors.

However, good fundamentals are by far the best incentive and attraction for FDI. From this point of view, explicit GIIP are sometimes denoted as a second-best policy for governments that are unable to offer good fundamentals to foreign investors [Jahn, Zigic, 2001].

There are three main categories of government investment incentives and promotion – see, for example, [Pain, 2002]. The first is tax incentives, including preferential tax rates and capital allowances. They determine the post-tax returns of FDI projects even if production costs are equalised across countries. On the other hand, the tax rate in a particular recipient country might not be of great relevance where "transfer pricing" by MNCs is possible. Tax incentives are also considered by international investors to be a relatively temporary and easily removable policy.

Financial incentives are also one of the elements of GIIP. They include factors such as government grants and subsidies, loan guarantees, preferential loans, and government equity participation in high-risk investments.

The last category of GIIP, namely non-financial measures, includes the provision of subsidised infrastructure such as prepared industrial areas, free-trade zones and preferential government contracts (offset programs, etc.) [Pain, 2002].

As regards the influence of government investment incentives and promotion schemes on the particular types of FDI (horizontal vs. vertical), it is commonly accepted that these arrangements can increase the country's comparative advantage for both types of FDI. However, vertical (cost-minimising) FDI is more focused on cost differentials across countries and thus considered to be a kind of "globetrotter". Therefore, it seems more sensitive to investment incentives.

The situation in the field of government investment incentives and promotion in the case of the Czech Republic is described in Appendix 2.

3. Empirical Analysis of Determinants of Inward FDI in the Czech Economy

This section is devoted to the presentation of econometric estimation results aimed at identifying the main determinants of inward FDI in the last decade in the Czech Republic. Standard microeconomic and macroeconomic factors consistent with the underlying theory will be used for the choice of explanatory variables. Based on these estimated equations, conclusions will be

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[8] Notwithstanding the situation where a government attracts FDI by means of GIIP at a time when unemployment, insufficient investment and weak growth are a central policy problem.

drawn about the factors that may have played an important role in attracting FDI in recent years in the Czech Republic. The other goal of the empirical analysis is, therefore, to provide an indication about the prevailing character of inward FDI. Subsequently, policy recommendations related to promoting FDI inflows into the Czech Republic in the future will be formulated at the very end of this section.

3.1 Preliminary Data Analysis and Formulation of Basic Hypotheses

The development of FDI inflows will be examined in terms of logarithms of quarterly inflow of FDI at constant (1995) prices using the deflator of gross fixed capital formation (FDI_CP_FLOW). The reason for using this particular variable is to extract information about factors that initiate changes in real capital inflows that result in a transfer of physical capital stock and related technology. [9, 10]

As mentioned above, there are several theoretically relevant factors affecting the behaviour of FDI. In our case, we use the following variables to explain the inflow of FDI into the Czech Republic in the last decade:

- Nominal unit labour costs (ULC), expressed in euro, to capture the influence of the wage competitiveness of the Czech economy from a foreign investor's point of view. This variable allows for labour productivity effects based on Czech GDP at constant (1995) prices versus the number of employed people. The expected effect is negative. A statistically significant negative effect of ULC on inward FDI could indicate that FDI incoming into the Czech Republic has been prevailingly of the vertical pattern.[11]

- The current account deficit at constant (1995) prices (CA_CP) as a measure of the vulnerability of the economy in terms of real external disequilibrium. The expected effect is negative due to the assumption that foreign investors are aware of the riskiness of the recipient country, which is expressed using this variable in our case.

- Real GDP in twelve EU countries (EU_GDP_CP).[12] This series should serve as an indicator of the economic climate in the area from which the bulk of inward FDI flows into the Czech Republic. Consequently, it potentially gives an indication of the willingness of European MNCs to invest abroad. It is commonly accepted that in the case of vertical FDI a substantial part of the production from foreign affiliates is intended to be re-exported to FDI home countries. Hence the actual domestic economic climate and business cycle development in

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[9] There is not much reliable information about the structure of FDI inflow in particular years or even quarters in terms of discriminating privatisations, joint ventures, brownfield and greenfield projects, etc. That is why privatisation revenues cannot easily be deducted from the total inflow of FDI and inward FDI has to be modelled as whole.

[10] The key statistical data related to inward FDI in the Czech Republic in the last decade are shown for illustration in Appendix 1.

[11] Actually, we should consider the competitiveness of the Czech economy against similar countries based on its relative change with respect to unit labour costs in competitor countries. However, the influence of the relative unit labour costs of the Czech economy compared to nine countries (Chile, Ireland, Netherlands, Taiwan, Spain, Hungary, Poland, etc.) turned out to be statistically insignificant. Moreover, there was an intention to conduct the empirical examination purely in a time-dimension line, without considering cross-country links.

[12] These are all the EU members except Luxembourg, Ireland and Greece.

those countries can play a crucial role in an MNC's decisions relating to the timing of its vertical FDI activities. A positive impact would indicate a vertical pattern of inward FDI in the Czech Republic.[13]

- The share of CzechInvest projects (expressed as a three-quarter moving average) in the total FDI inflow (SH_PROJ_FDI_L). This should serve as a proxy for lasting government effort to offer investment incentives and to assist foreign investors when settling in the Czech Republic via this special agency (see Appendix 2). This variable is led by three quarters for further econometric exploration in order to capture the relation under special circumstances. There is approximately a three-quarter time lag between the announcement of a particular CzechInvest project and the real financial flow captured in the balance of payments. The expected impact is positive.[14]

- Lagged FDI inflow approximating the existing FDI stock in order to allow for "agglomeration" or "clustering" effects (FDI_CP_FLOW(-1)). The expected impact is positive.

- Real GDP in the Czech Republic (CR_GDP_CP) in order to catch the effects of the possible influence of the market size of the Czech Republic and thus reveal the prevailing pattern of the inward FDI in the Czech Republic. A significant positive impact would indicate a horizontal pattern of incoming FDI in our country.

- The share of general government expenditure in GDP (GEN_GOV_EXP). The outlays include central and local government expenditure, pension and social security entitlements, investment expenditure, all extrabudgetary expenditure, and loan repayments. This variable should approximate the government's intention to attract FDI into the country by means of improving infrastructure, increasing payments into the social system in order to maintain social cohesion, and providing the economy with efficient public governance and an institutional and regulatory framework. We can expect a positive impact of this variable.

The Dickey–Fuller unit root test indicates that FDI_CP_FLOW is integrated of order one (I(1)) (see Table 1 for detailed results). In this case we have two possible ways of dealing with such a series; either to transform it to make it stationary (e.g. by means of differencing), or to employ cointegration analysis and to estimate a cointegration relation (cointegrating vector). The latter possibility is more appropriate if there is an assumption of a long-run equilibrium relationship between FDI_CP_FLOW and the explanatory variables discussed above. This assumption means that if several variables are cointegrated, they must obey an equilibrium relation in the long run

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[13] From the theoretical point of view, however, the opposite impact is also possible. MNCs might shift production to countries like the Czech Republic during a period of slower growth in the EU in order to lower costs of production or expecting higher growth of the other regions in the medium term (in the case of horizontal FDI).

[14] "Government effort" covers a broad range of investment incentives and promotion activities, most of which are not easily expressible in a statistical way. SH_PROJ_FDI_L is one of the few variables suitable and available for econometric analyses. However, we are aware that there could be some caveats regarding its use in the cointegration relationship below. As shown in Appendix 2, according to a survey evaluating the investment climate and the satisfaction of foreign companies in the Czech Republic, foreign investors consider the existence of government investment incentives and promotion to be the second most important factor of attractiveness of the Czech Republic. However, this finding may suffer from sample-selectivity bias.

although they may diverge substantially from this equilibrium in the short run. [Davidson, MacKinnon, 1993].

To test for cointegration, we first verify that all the above-mentioned variables that we expect to be cointegrated with FDI_CP_FLOW are each individually I(1).[15, 16]

Figure 1: The Development of the Key FDI-Related Variables
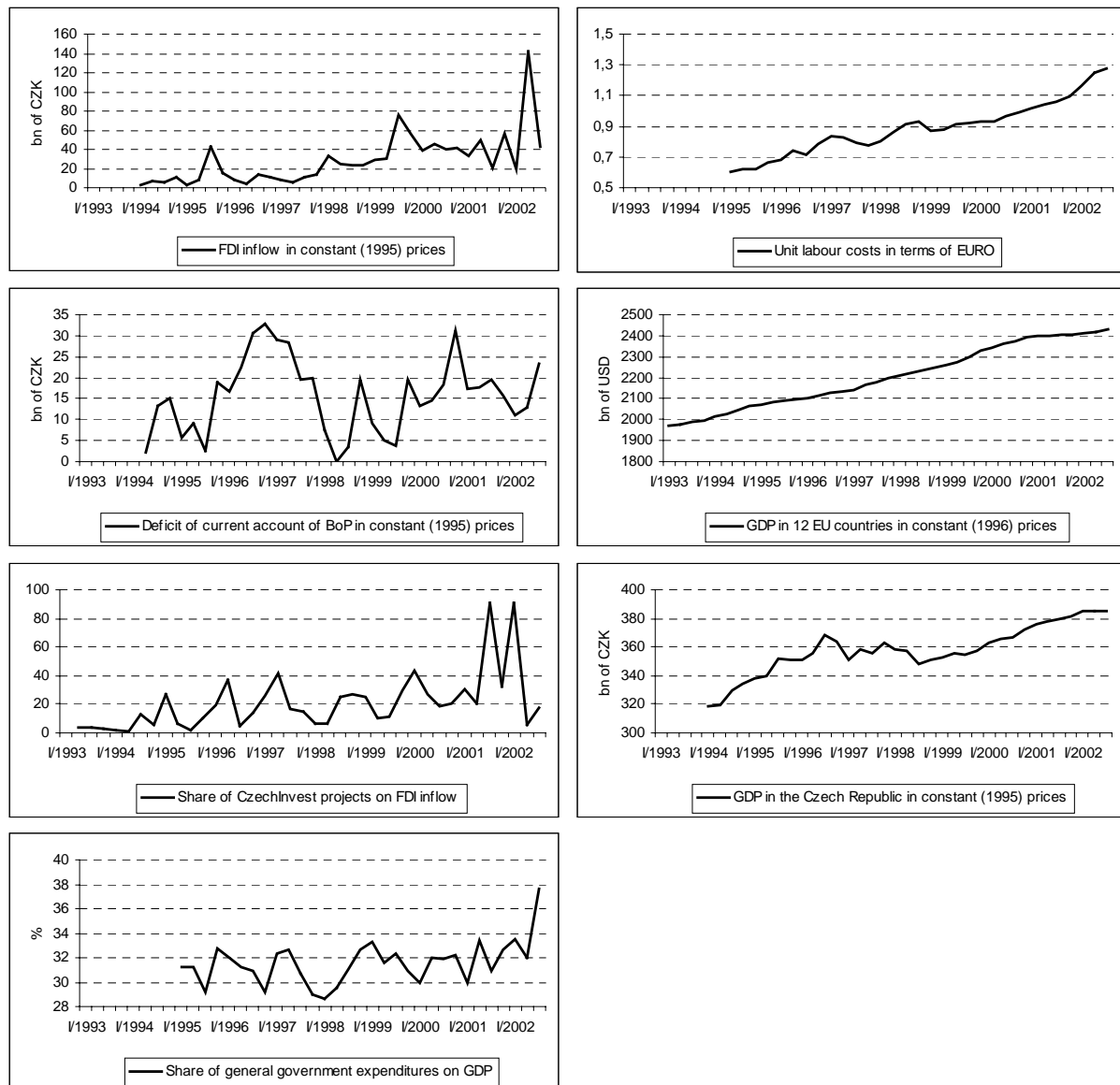
In the cases of ULC, EU_GDP_CP and CR_GDP_CP we anticipate that the average pace of their growth is positive, i.e. these are unit root processes with a positive drift. As seen in Table 1, all

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[15] All the variables below including FDI_CP_FLOW are logarithms of quarterly values of a particular factor.

[16] See Figure 1 for an overview of the development of these series as such over time.

the variables are I(1) and in all cases the ADF could not reject the hypothesis of a unit root (non-stationarity). All the first differences of these variables are already stationary, i.e. I(0) processes.[17]

Table 1: Results of Unit Root Testing (ADF)

series	actual series		1st differences	
	ADF test stat.	5% critical value	ADF test stat.	5% critical value
FDI_CP_FLOW	0.3137	-1.9510	-9.4636	-1.9514
ULC	-0.3340	-2.9627	-4.8239	-2.9665
CA_CP	-1.2065	-1.9514	-7.2074	-1.9517
EU_GDP_CP	-1.0123	-2.9399	-3.6574	-2.9422
SH_PROJ_FDI_L	-1.7421	-1.9501	-9.0125	-1.9504
CR_GDP_CP	-1.9293	-2.9499	-6.1193	-2.9527
GEN_GOV_EXP	-0.6444	-1.9526	-7.2838	-1.9530

There are many techniques in the econometric literature describing how to deal with integrated series, to test cointegration, or to construct and estimate error-correction models (ECMs) – see, for example, [Hamilton, 1994]. Based on this, vector autoregression models (VAR models) and the Engle–Granger approach are considered to be the two most appealing methods for our purposes.

The advantages of vector modelling using the theory of VAR models over the Engle–Granger approach are straightforward. Namely, VAR structures enable complex identification and estimation of cointegration relations among interdependent variables.

Compared with the multivariate modelling strategy, the univariate approach has its limitations. This method, based on the Engle–Granger cointegration test, supposes and identifies only one cointegration relation among the set of variables. Moreover, the simplicity of the univariate model could be insufficient for describing all the statistically significant relationships.

Therefore, in our econometric exercise below we rely on the VAR methodology. Given the very short time series available for the analysis, however, the results were also derived by relying on the Engle–Granger approach.

As will be shown below, due to weak exogeneity the VAR model can be reduced to a single-equation model. Moreover, the final model obtained from the VAR will be quite similar to that derived from the univariate approach. This comparison supports the robustness of the presented results, including their interpretation and conclusions.

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[17] Despite the results of the ADF test, there may be some caveats as regards our assumption of non-stationarity of some of the variables tested above reflecting the theoretical point of view relevant in the long run. For example, FDI_CP_FLOW and CA_CP should behave as I(0) variables in the sufficiently long run based on the theory. However, we do not have a sufficiently long time series at our disposal to prove the validity of this theoretically based assumption, so we cannot ignore the results of the ADF test when building the econometric model below. The author can provide more details about the testing of the stationarity of the selected variables on request.

3.2 Empirical Examination

3.2.1 Estimation of a Cointegrating Vector

In order to identify a cointegration relation among the variables mentioned in the previous subsection, we employ the Johansen cointegration test. This test is based and dependent on the entire structure of the VEC system estimated without any reduction of parameters.[18] Brief results of its application on the above-listed time series are shown in the next two tables.[19]

Table 2: Results of the Johansen Cointegration Test

Sample: 1995:1 2002:3 Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.690543	75.77532	68.52	76.07	None *
0.588868	41.76014	47.21	54.46	At most 1
0.302004	15.98378	29.68	35.65	At most 2
0.168667	5.557056	15.41	20.04	At most 3
0.006874	0.200044	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 1 cointegrating equation(s) at 5% significance level

The results of the test indicate that one statistically significant cointegrating vector is identified among the following variables:

- FDI_CP_FLOW
- ULC
- CA_CP
- SH_PROJ_FDI
- EU_GDP_CP

Consequently, the normalised cointegration vector is of the following form:

Table 3: The Normalized Cointegration Vector

Variable	FDI_CP_FLOW	ULC	CA_CP	SH_PROJ_FDI_L	EU_GDP_CP	C
Norm. coint. coefficient	1.00000	0.03181	0.32025	0.83660	-19.07937	138.11560
Std. error		1.59368	0.09127	0.34287	4.75960	

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[18] Cointegration analysis and error-correction models for modelling foreign direct investment in the Czech Republic were employed among others in [Mandel, Tomšík, 2001]. The authors identified a cointegration vector for FDI inflow and estimated an error-correction model using the Engle–Granger approach. They used real/nominal short-term interbank interest rates, the rate of unemployment in the Czech Republic and Czech real GDP as variables connected to FDI in both the long and short run. However, their estimation was done with a different research objective and using a different specification. That is why we do not want to compare the results of our econometric exploration with their findings.

[19] The test allows for intercept (no trend) in the cointegration equation and intercept in restricted VAR. There are no exogenous variables in VAR included, and a one-quarter lag in VAR has been imposed. A one-quarter lag in VAR has been identified as optimal using the Akaike information criteria and the LR test.

We can see in Table 3 that the parameters of the cointegrating vector serving as long-run multipliers all have the right signs except SH_PROJ_FDI_L. All the variables except ULC are statistically significant.

It would be possible to continue the vector approach and to build and estimate an error-correction model based on the entire VEC specification using the estimated cointegration relation in Table 3. However, the available data series are not long enough to obtain stable and robust estimation results when applying this procedure completely.

Thus, in order to switch to the univariate approach when building the ECM, the parameters of the cointegrating vector (in Table 3) within the VEC structure need to be re-estimated and the assumption of weak exogeneity of all the variables (except FDI_CP_FLOW) needs to be tested.

Hence, we jointly test the weak exogeneity assumption in the restricted VAR model. In other words, we verify whether any of the loading parameters are equal to zero in particular equations of the VEC system. This would mean that the error-correction term is statistically insignificant in particular equations of the dynamic short-run relationship. If the group of variables is weakly exogenous, then the reduction of the VAR model to the univariate approach does not lead to a loss of information carried by the data and no substantial distortion is made when estimating the univariate error-correction model. This would be favourable from the economic point of view, since it could give stronger guidance for interpretation of the results.

As is obvious from the results in Table 4, the test does not reject a weak joint exogeneity in the case of ULC, CA_CP, SH_PROJ_FDI_L, and EU_GDP_CP at the 10% significance level.[20] The LR test of restrictions suggests that there is no substantial loss of information by imposing a restriction on the loading parameters (coefficients Alpha in Table 4) to be equal to zero for all dynamic equations except the equation of short-run dynamics of FDI_CP_FLOW. Hence, we can consider this group of variables to be weakly jointly exogenous.

Table 4: Results of the Weak Joint Exogeneity Test

Series	Beta	Standard errors of beta	t - Statistic	Alpha	Standard errors of alpha
FDI_CP_FLOW	1.00000	0.00000		-1.04690	0.17230
ULC	2.21480	1.26630	1.74903	0.00000	0.00000
SH_PROJ_FDI_L	-0.37964	0.10237	-3.70851	0.00000	0.00000
EU_GDP_CP	-16.10800	4.31740	-3.73095	0.00000	0.00000
CA_CP	0.25054	0.06755	3.70901	0.00000	0.00000

LR test of restrictions: Chi^2(4) = 7.1763 [0.1269]

Simultaneously, we obtain parameter values of the cointegration relationship, termed "long-run multipliers", that are compatible with the above-mentioned restriction imposed on the system

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[20] The test allows for no explicit intercept in the cointegrating equation. There are no exogenous variables in VAR included and a one-quarter lag in VAR is imposed.

(shown in the second column *Beta* in Table 4). The corresponding standard errors imply that they are all statistically significant and have the expected sign supposed by the underlying theory.[21]

Now we can compare the estimated cointegrating vector arising from the vector approach based on a VEC model (see Table 4) with the results of the univariate approach based on a single OLS regression model – the Engle–Granger method. A brief comparison of the estimated parameters of the cointegration equations is shown in Table 5.

Table 5: Comparison of Both Methods of Estimating Cointegration

Variable	Estimated parametres of CE		t-statistic of estimated parametres	
	E-G OLS	VEC with restriction	E-G OLS	VEC with restriction
C	-126.0997	-	-2.88682	-
ULC	-2.17422	-2.21480	-1.57809	-1.74903
CA_CP	-0.16536	-0.25054	-2.10478	-3.70901
EU_GDP_CP	16.43839	16.10800	3.37240	3.73095
SH_PROJ_FDI_L	0.37337	0.37964	3.13827	3.70851

As can be seen in Table 5, the values of the parameters of the cointegrating vector estimated by means of the VEC restricted structure and their statistical significance are very similar to those obtained within the univariate Engle–Granger procedure.

The similarity of both cointegrating vectors obtained by the two different approaches suggests the robustness of the existence of a cointegration relationship among the above-mentioned variables. These encouraging results give justification for further econometric investigation in terms of estimating a univariate error-correction model, included in the next section.

3.2.2 Building and Estimating a Univariate Error-Correction Model

The results of the Johansen test and the test of weak exogeneity justify reduction of the vector approach into univariate modelling, namely into an estimation of a univariate error-correction model.

The ECM model is intended to describe the short-term dynamics of FDI inflows in the Czech Republic in the last decade. Error-correction models represent an alternative approach to dealing with integrated variables besides the standard approach which leads to differencing the series as many times as needed to transform them into stationary series [Davidson, MacKinnon, 1993]. This type of model explains the immediate short-term changes in dependent variables by means of deviations from a particular equilibrium relationship between these dependent variables and the explanatory variables. These deviations are often called error-correction terms.

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[21] With respect to footnote 14, we try to re-estimate the cointegration relation without the presence of SH_PROJ_FDI_L. Nonetheless, it turns out that the new cointegration relation is statistically insignificant.

So now we use deviations from the cointegration relation estimated in the previous section as the error-correction term when building the ECM. The results of estimation of the ECM exploiting this error-correction term are shown in Table 6.

Table 6: The Error-Correction Model

Dependent Variable: DIF_FDI_CP_FLOW				
Sample(adjusted): 1996:2 2002:3				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-112.4486	20.0266	-5.6149	0.0000
DIF_ULC	-6.3416	2.0691	-3.0648	0.0061
ECT_VEC(-1)	-0.9130	0.1623	-5.6259	0.0000
DIF_SH_PR_FDI_L	0.3852	0.0817	4.7122	0.0001
DIF_GEN_GOV_EXP(-4)	5.1732	1.4007	3.6934	0.0014
SH_CA_GDP(-2)	-0.1085	0.0599	-1.8126	0.0849
R-squared	0.819221	Durbin-Watson stat	2.467984	
Adjusted R-squared	0.774027	S.D. dependent var	0.735709	
S.E. of regression	0.349732	Akaike info criterion	0.935872	

The variables are defined as follows:

- C is a constant.
- DIF_FDI_CP_FLOW denotes the first differences of FDI_CP_FLOW as the dependent variable.
- DIF_ULC stands for the first differences of ULC. We expect a negative effect of this factor similar to that in the cointegration equation in line with the assumption of verticality of incoming FDI.
- ECT_VEC is the error-correction term from the VEC model structure and its coefficient should be negative according to the theory of ECM.
- DIF_SH_PR_FDI_L denotes the first differences of SH_PROJ_FDI_L with an expected positive sign as in the long-run relationship.
- DIF_GEN_GOV_EXP stands for the lagged differences of the share of general government outlays (including central and local government expenditure, pension and social security entitlements, investment expenditure, all extrabudgetary expenditure, and loan repayments) in GDP. The expected sign of this variable is positive in line with what has been discussed above.
- SH_CA_GDP denotes the share of the current account deficit in GDP at current prices lagged by two quarters to allow for the impact of external disequilibrium and the vulnerability of the economy in the short run. Similarly to CA_CP in the cointegration equation, this factor should affect the behaviour of inward FDI in a negative manner.

As during the estimation of the cointegration equation above, in this case we also try to include all plausible variables to capture a variety of factors influencing the short-run dynamics of inward FDI. Naturally, we attempt to employ the first differences of all the variables in the cointegration equation when estimating the ECM and even several more variables suggested by the theory and

empirical evidence from abroad. However, not all of them turn out to be statistically significant at a reasonable level.

Thus, as we can see in Table 6, all the explanatory variables are statistically significant at the 10% significance level and all have the right sign. The lags of the explanatory variables are chosen in order to optimise the explanatory power of the model and statistical significance of the regressors. Simultaneously, the economic interpretation of such econometric results is taken into account as well when changing the lag structure.

The coefficient standing by the error-correction term (known as the "loading parameter") is the most significant parameter, which indicates that the difference from the long-run cointegration relation is a substantial factor determining the development of inward FDI in the near-term horizon.[22] The explanatory power of the estimated error-correction model is quite remarkable.

The in-sample fits of the above-estimated model in terms of both differences of the real FDI inflow and the real FDI inflow as such are depicted in Figure 2.

Figure 2: The In-Sample Fits of the Estimated Model
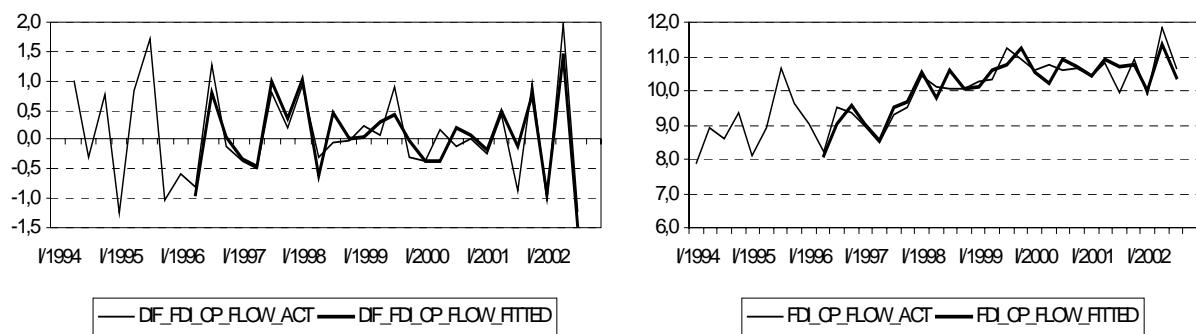
3.3 Summary and Interpretation of the Empirical Analysis Results

We conclude that we have succeeded in estimating a statistically significant long-run cointegrating relationship between real FDI inflow on the one hand and the following factors on the other hand:

• the evolution of unit labour costs in terms of foreign currency, reflecting changes in the international competitiveness of the Czech economy

• the vulnerability of the economy, approximated by the current account deficit measured at constant prices

• economic performance in the main EU countries, and

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[22] The inverse value of the loading parameter can be interpreted as the length of time needed for return to equilibrium. Value of 1.1 quarters indicates quite a high speed of adjustment, which seems relatively unrealistic. This fact is probably affected by the structure of the data set and the short time series.

- the share of CzechInvest projects in total FDI inflow, approximating the lasting intention of the Czech government to provide foreign investors with investment incentives and promotion.[23]

Simultaneously, the results suggest that the privatisation process and sales of state-owned property by the government do not seem to be an important factor of inward FDI in the long run. The reason probably lies in the fact that privatisation is generally considered to be a temporary process related to the transition of the economy and investors would prefer countries providing a stable economic environment in the long run. However, in the Czech case the privatisation sales are not statistically significant in the short run either.

Similarly, the GDP of the Czech economy does not turn out to be a statistically significant factor either in the long-run cointegration relation or in the short-run dynamics. That could be a consequence of two possible reasons, namely:

- Actual economic development is not of a great relevance to investors, since they focus on the long-run growth and market size prospects potentially arising from the Czech Republic's future accession to the EU. The particular evolution of the business cycle in the Czech economy does not influence investors' strategic decisions regarding the time horizon of five or ten years.
- Inward FDI in the Czech Republic is not primarily oriented on the local market (which would be the case with vertical FDI rather than horizontal FDI). FDI inflows are independent of the prosperity and size of the Czech economy (measured by real GDP). The reason for such behaviour by investors might be the heavy export orientation of their investment projects in the Czech Republic. The motivation of these investors might be to benefit from the comparative advantage offered by the Czech Republic in terms of cheap labour, government investment incentives and advantageous geographical location. The validity of this explanation could be supported by the statistical significance of unit labour costs and the share of CzechInvest projects in total FDI in both the long-run and short-run relations describing the behaviour of inward FDI. Moreover, the statistical significance of real GDP in the twelve EU countries in the cointegrating vector also suggests that inward FDI coming to the Czech Republic has been prevailingly of a vertical character.

The empirical analysis does not identify a statistical significance of the lagged dependent variable included in the error-correction model. This means a rejection of the hypothesis that the short-run dynamics of inward FDI are influenced by the previous development of FDI influx by means of the "agglomeration" or "clustering effect". Or alternatively, the lagged FDI inflow is not a good proxy for the clustering effect.

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[23] CzechInvest projects include greenfield projects, brownfield projects, joint ventures, technical co-operation and expansions in manufacturing, and strategic services and technological centres as the new knowledge-based industries. Since 1998, the assistance of CzechInvest has meant simultaneously the possibility of receiving government investment incentives and promotion (see Appendix 2). On the other hand, privatisations and private M&As are realised without any assistance from CzechInvest.

The almost accounting relationship between FDI inflow and reinvested earnings on the basis of the balance of payments does not turn out to be of statistical significance due to the general pattern of inward FDI in the Czech Republic in recent years.[24]

It is likely that the government can influence inflow of FDI in both the long and short run by introducing and maintaining a competitive scheme of government investment incentives and promotion. This finding is confirmed by the fact that GIIP has become a very substantial element in competition among countries fighting for inward FDI in the last decade, as suggested by the foreign empirical evidence.

Based on the results of the error-correction model, the government can accelerate the FDI inflow in the short run by increasing public expenditure on infrastructure, efficient public governance, a functioning legal and regulatory framework for the economy, and a flexible social system.

The results presented imply that sustainability of external equilibrium and the threat of deep indebtedness in terms of foreign capital might have played an important role in the decision-making of foreign investors in choosing to locate their foreign affiliates in the Czech Republic. The underlying explanation of the specific influence on FDI is obvious. It is commonly accepted that trouble-free transfer of profits is generally one of the most important requirements emphasised by foreign investors when investing abroad. Simultaneously, there is a notion that current account disequilibrium can endanger the ability of an economy to generate sufficient foreign currency liquidity to enable the desired smooth transfer of profits from FDI in the economy back to home countries. Therefore, it is noteworthy that based on the analysis this factor turns out to be of great relevance in the Czech case as well, which may have important policy implications.[25]

4. Conclusion

The ultimate goal of the project was to obtain quantitative evidence and an econometric estimation describing the determinants of FDI in the case of the Czech economy. In order to do that, the paper explores the theoretical background and foreign empirical evidence regarding possible factors determining the behaviour of inward FDI.

We can conclude that the final empirical results concerning the relevant determinants of the FDI inflow into the Czech Republic correspond to a certain extent to the theoretically considered and

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[24] In this context, there is a discussion on the possible negative effects of MNCs' profits on the current account and balance of payments and foreign exchange liquidity as a whole. If the profits are reinvested in the form of FDI, then they constitute no effective foreign exchange demand because they improve the financial account at the same time. It is obvious, however, that the decision on FDI in the form of reinvested earnings is subject to the same criteria in an MNC as in the case of direct FDI influx from abroad. Moreover, in the case of the Czech Republic, the growing FDI inflow is probably associated with an improvement on the current account through an enhanced export capacity of the domestic economy.

[25] [Benáček, 2000] presents results of several selected studies concerning FDI behaviour in Czech industrial enterprises in the 1990s. The author concludes that foreign investors were initially only rarely motivated to base their ventures on the endowments of local human capital. Their motive was to take advantage of the availability of cheap labour. This is in line with our results in this study.

empirically tested factors. Simultaneously, there is an indication based on the empirical results that inward FDI in recent years has been prevailingly of a vertical character in the Czech Republic. In other words, foreign investors have focused on the comparative (dis)advantage of the Czech economy in terms of input prices, government promotion of FDI and economic vulnerability.

Thus, the estimated econometric model and the interpretation of its results provide some guidance for evaluating the role that the particular factors considered may have played in affecting FDI inflow in the past. These results also indicate that there is an important role for the government in attracting FDI inflows into the Czech Republic. Hence, the results presented in the paper can serve as a basis for formulating policy recommendations as well.

More specifically, the empirical results suggest that if the Czech government intends to accelerate FDI inflow then it should attempt to establish and maintain overall macroeconomic stability and external equilibrium. In a small open economy framework with a close relationship between internal and external disequilibrium, this intention means maintaining a stable internal economic environment in particular.

A consistent and competitive package of government investment incentives and promotion is another measure promoting inward FDI. Although GIIP are not a market based instrument of economic policy, their high and growing importance for the decision-making of multinational companies on the location of their foreign affiliates is confirmed by empirical studies and overviews from abroad as well.

Finally, a high-quality infrastructure, well-functioning public governance, an efficient legal and regulatory framework for the economy, and social cohesion supported by a flexible social system are also necessary preconditions for any economy to successfully compete for inward FDI.

The insufficient length and structure of economic time series and structural changes related to the transition process considerably complicate the empirical analysis of FDI inflows in the Czech Republic. Therefore, we consider the results of the empirical analysis and econometric estimation as preliminary and indicative. Accordingly, at this stage the estimated model is probably not an appropriate tool for forecasting purposes.

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Appendix 1

Basic Data on FDI in the Czech Republic

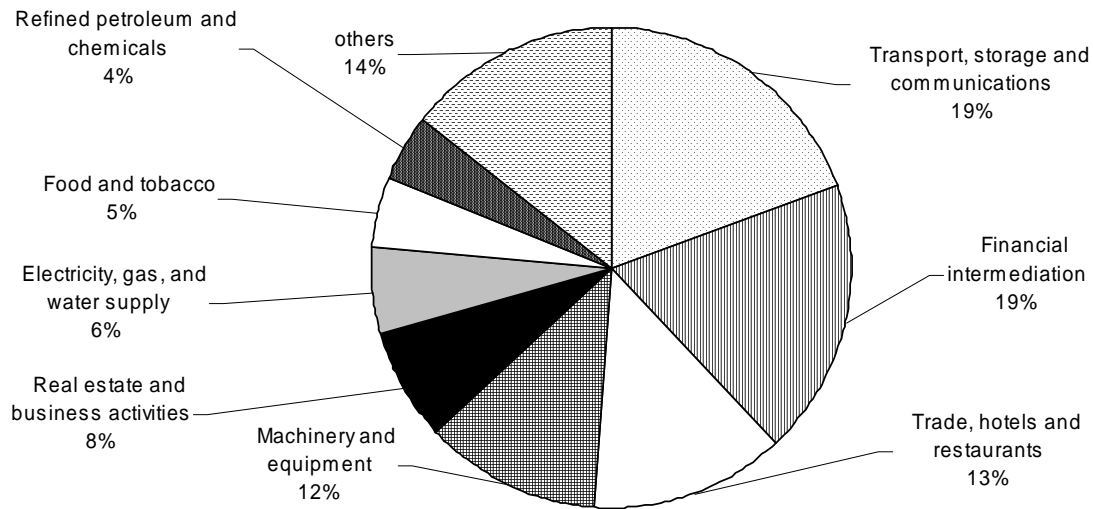## 1. Development of Inward FDI in Terms of Flow and Stock During the Last Decade
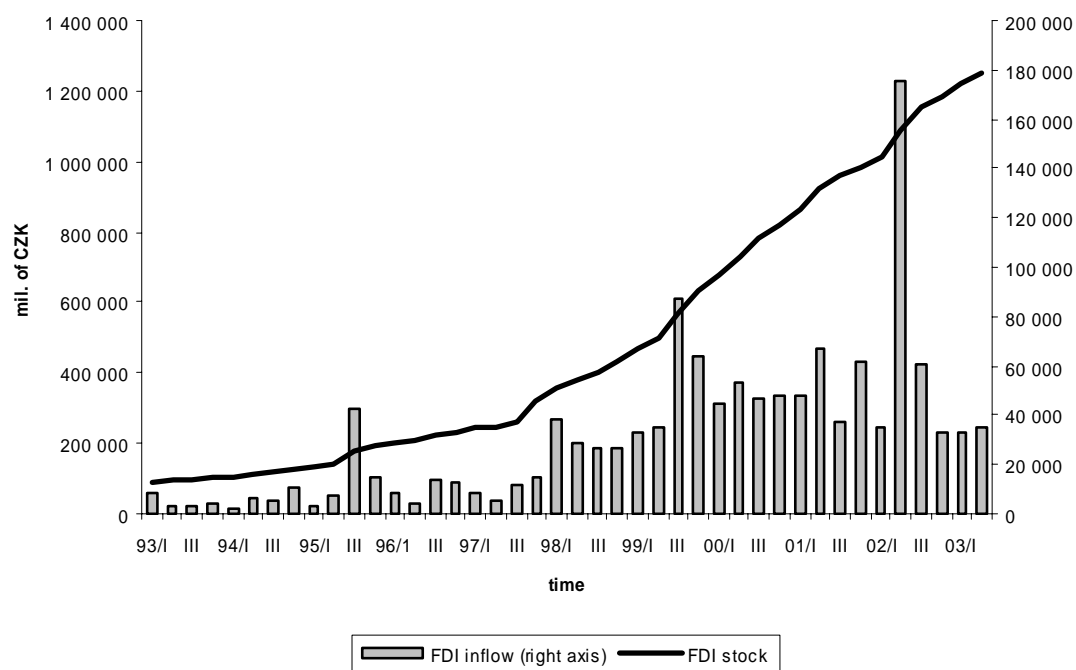
Source: Balance of payments of the Czech Republic in 2002 Q4,
http://wdb.cnb.cz/cnbeng/cnbeng.wwv_main.main?p_language=us&p_cornerid=1822,and
International investment position of the Czech Republic in 2002 Q4,
http://wdb.cnb.cz/cnbeng/cnbeng.wwv_main.main?p_language=us&p_cornerid=1904&p_full=1

2. Comparison of the Czech Republic with Several Other CEE Countries as Regards Inward FDI

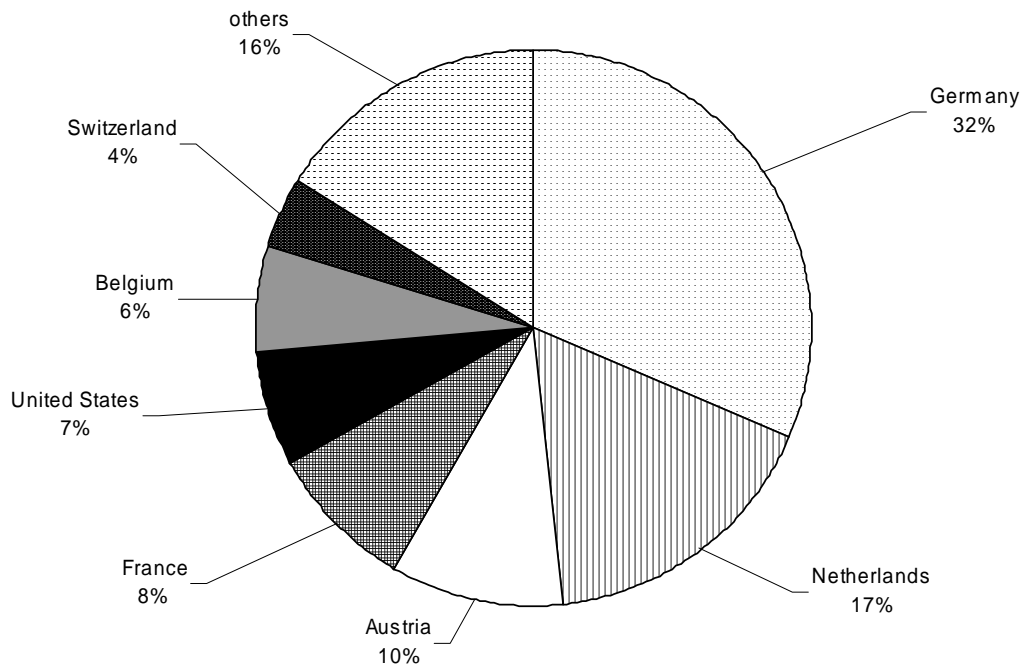| in USD	FDI inflow per capita				FDI stock per capita				cumulative FDI inflow per capita			
year	Czech Rep.	Hungary	Poland	Slovakia	Czech Rep.	Hungary	Poland	Slovakia	Czech Rep.	Hungary	Poland	Slovakia
1990	NA	NA	NA	NA	NA	53.3	NA	NA	NA	NA	2.3	NA
1991	NA	141.2	7.6	NA	NA	205.7	NA	NA	NA	141.2	9.9	NA
1992	NA	142.9	17.7	NA	280.1	351.8	NA	NA	NA	284.3	27.6	NA
1993	63.2	227.4	44.7	NA	331.5	591.4	NA	NA	63.2	512.2	72.3	37.4
1994	85.0	111.0	48.8	50.5	440.1	723.6	98.6	167.8	148.2	624.1	121.0	87.7
1995	248.7	438.8	95.2	44.0	711.9	1 284.4	204.1	241.9	397.0	1 063.9	216.1	131.5
1996	139.1	221.3	117.1	65.3	831.2	1 574.1	298.5	380.7	536.6	1 287.6	333.4	196.5
1997	124.9	211.5	127.7	32.3	896.4	1 708.8	379.7	386.9	662.1	1 502.7	461.0	228.5
1998	359.4	199.5	165.7	104.2	1 396.9	1 852.4	585.3	535.9	1 022.3	1 707.2	627.0	332.3
1999	614.0	194.3	189.4	65.5	1 707.2	2 019.1	679.5	590.3	1 637.3	1 907.6	816.9	397.4
2000	485.4	162.4	243.6	379.4	2 107.0	1 968.6	892.4	877.6	2 124.1	2 076.8	1 060.9	776.3
2001	481.7	241.3	149.1	272.5	2 618.7	2 202.0	1 076.3	1 027.6	2 616.5	2 324.1	1 210.8	1 047.7
2002	822.3	85.3	141.0	737.5	3 306.2	2 636.2	1 250.4	1 150.8	3 429.1	2 418.1	1 352.3	1 783.4

Source: http://countrydata.bvdep.com./cgi/template.dll and the author's calculation
http://wdb.cnb.cz/cnbeng/cnbeng.wwv_main.main?p_language=us&p_cornerid=1904&p_full=1
http://english.mnb.hu/module.asp?id=134&did=1874
http://www.nbp.pl/en/statistics/index.html
http://www.nbs.sk/

3. Foreign Direct Investment in the Czech Republic by Industry – Shares on Cumulative FDI Inflow During 1993 – 2002

Refined petroleum and chemicals
4%

others
14%

Transport, storage and communications
19%

Food and tobacco
5%

Financial intermediation
19%

Electricity, gas, and water supply
6%

Real estate and business activities
8%

Machinery and equipment
12%

Trade, hotels and restaurants
13%

Source: http://www.cnb.cz/en/stat_pb_pzi.php

4. Foreign Direct Investment in the Czech Republic by Country – Shares on Cumulative FDI Inflow During 1993 - 2002

others
16%

Switzerland
4%

Germany
32%

Belgium
6%

United States
7%

France
8%

Austria
10%

Netherlands
17%

Source: http://www.cnb.cz/en/stat_pb_pzi.php

5. Penetration of FDI-Related Enterprises into Entrepreneurial Sector – Share of Enterprises under Foreign Control on Value Added and Gross Fixed Capital Formation[26]
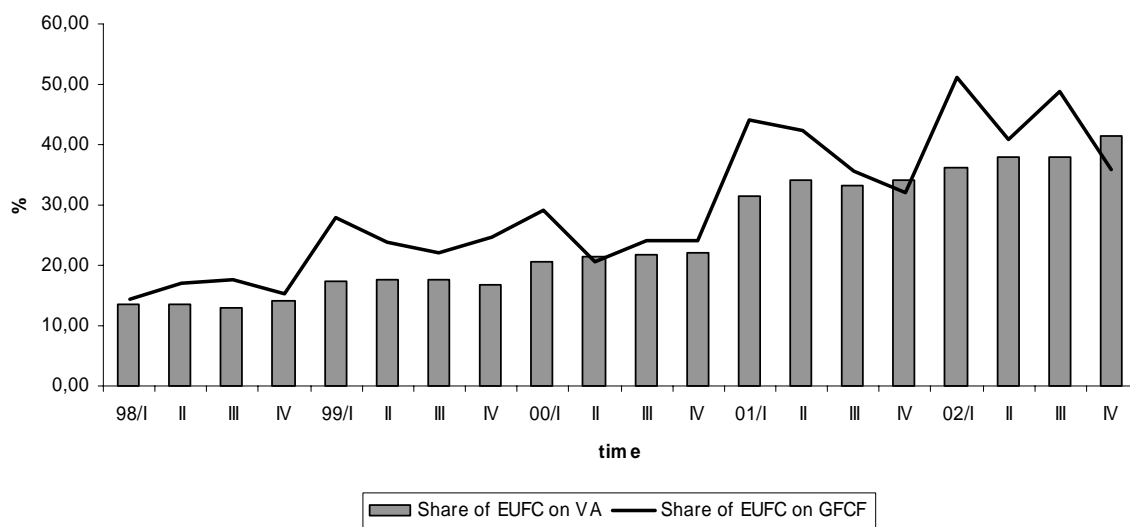
Source: ČSÚ (2002), *http://www.czso.cz/csu/edicniplan.nsf/p/5103-02*

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[26] In the context of growing share of enterprises under foreign control on economic activities in the Czech Republic in recent years, a phenomenon of so called "dual economy" is being mentioned very often. There is a discussion whether there are some technological spillovers between foreign firms and local enterprises or whether a mere „batting average effect" causes the accelerating productivity growth of the Czech business sector. This issue along with some others are possibly going to be an object of our future study on impacts of FDI inflow.

Appendix 2

Government Investment Incentives in the Czech Republic

The turning point in the development of FDI inflow in 1998 is often considered to be a consequence (among others) of the implementation of an explicit government investment incentives and promotion (GIIP) scheme in the Czech Republic. Surprisingly, it competed for FDI during 1990–1997 without a proper GIIP regime.[27] As a result, the Czech Republic was not very successful in attracting FDI and did not experience much positive structural and technological change following the FDI inflow such as in the case of Hungary in those years.

In 1998 the environment began to change. At first government decrees, and since 2000 the Act on Investment Incentives, have established a regime within which a relatively consistent, transparent and competitive set of GIIP is granted to both foreign and domestic investors. Currently, according to the valid Act, the scheme for the manufacturing sector consists of:

- Tax incentives (up to 10-year tax relief) for greenfield and brownfield projects over USD 10 million (USD 5 million in areas with extraordinarily high rates of unemployment) in manufacturing (high-tech products or facilities) with environment-friendly building and operating capacities.

- Job creation grants – financial support for creation of new jobs for companies fulfilling the same criteria as for the tax incentive. The size of job creation grants depends on the level of unemployment in the district where the investment is made. It ranges from zero in areas with unemployment below the national average to a maximum of USD 5,300 per employee in districts with unemployment more than 50% higher than the average.

- Retraining grants – financial support for retraining new employees ranges from zero to a maximum of 35% of total training costs depending on the same criteria as in the case of job creation grants.

- Site support (within the Programme of support of industrial zones development) – provision of low-cost building, land and/or infrastructure. The incentive is granted to the municipality and/or the private developer in the form of subsidies provided for the development of site infrastructure and the transfer of land from state ownership to the municipality at an advantageous price.

(see [http://www.czechinvest.cz/ci/ci_an.nsf/Publikace?OpenPage])

Regarding investment incentives for strategic services and technology centres, a government decree introduced two new framework programmes, namely the Framework Programme for

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[27] The only substantial promotion measure was that "since July 1993 joint venture companies in the Czech Republic with a minimum 30% foreign ownership (but no less than $1,47 mil) have been allowed a one-year exemption from customs duties on raw materials or semi-processed goods imported through a foreign partner for further manufacturing in the Czech Republic" [Zemplinerová, Benáček, 1997, p. 6]. This piece of support was abolished at the end of 1996.

Support Strategic Services Projects and Framework Programme for Support of Establishment and Expansion of Technology Centres. The most important government incentives in these areas are:

- Subsidies for business activity, covering up to 50% of eligible business expenses (i.e. wage costs during the first two years or capital expenditure on buildings, machinery and equipment, including expenditure on intangible assets of up to 25% of the costs).

- Subsidies for training and re-training, covering up to 35% of special training costs per employee and up to 60% of general training costs per employee (general training refers to providing general knowledge and skills that can also be used outside the investor's project; special training refers to training by which employees gain knowledge that can be used only within the investor's project and cannot easily be transferred to other employers.

(see [http://www.czechinvest.cz/ci/ci_an.nsf/Publikace?OpenPage]):[28]

Besides the above-mentioned support, there are several additional measures designed to attract FDI into the Czech Republic and to promote investment generally. These are not included in the Act but they are included in special government decrees and in other central and local government and municipality programmes:[29]

- import duty exemptions for import of technology;

- regional support for investment in districts with the greatest structural problems;

- support from regional labour offices (branches of the Ministry of Labour and Social Affairs) based on subsidies for newly created jobs for previously unemployed people;

- support for small and medium-sized enterprises by means of advantageous loans provided by the state-owned Czech-Moravian Guarantee and Development Bank (Českomoravská záruční a rozvojová banka);

- a programme of support for Czech subcontractors.[30]

The Ministry of Industry and Trade established a state agency named CzechInvest in 1992 to attract foreign investors and to help them in founding new affiliates in the Czech Republic. The GIIP for foreign investors is conducted solely through CzechInvest, and projects processed by CzechInvest have become a substantial part of the total FDI inflow. Specifically, CzechInvest projects accounted on average for approximately 20% of the total annual FDI inflow in the last decade. The share of these projects in the total annual flow of inward FDI has reached around 30–

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[28] There is a very detailed specification of what is to be classified as *"Strategic service"* and *"Technology Centres"*, as well as strictly defined eligibility criteria for investors to gain those incentives (see [*http://www.czechinvest.cz/ci/ci_an.nsf/Publikace?OpenPage*]).

[29] Since investment incentives are a form of public subsidy, the whole system of incentives is designed to be compatible with EU regulations. In particular, applications for investment incentives must pass an evaluation by the Office for the Protection of Economic Competition (Anti-Monopoly Office), whose procedures define an exemption to the ban on providing public subsidies. The Anti-Monopoly Office decides on the total value of state aid (investment incentives) available to each investor (investment project).

[30] There is a question as to whether a scheme of investment incentives and promotion designed in such a way induces a sufficient volume of the positive externalities and technological spillovers that may generally follow FDI inflow. The existing system is definitely not ideal from this point of view, but an examination of this issue goes beyond the objective of this paper.

40% recently. Approximately 75% of CzechInvest projects have been granted a government investment incentive. It is widely accepted that CzechInvest has been operating successfully in attracting FDI into the Czech Republic.[31]

Every two years CzechInvest commissions a survey to evaluate the investment climate and the satisfaction of foreign companies in the Czech Republic. According to investors, the main reasons for inward FDI in the Czech Republic seem to be [Jahn, Zigic, 2001]:

- its cheap labour force (an advantageous ratio of wages/salaries to labour productivity) and long-standing and deep-rooted industrial and technical tradition,
- the existence of a government investment incentives and promotion scheme,
- its advantageous geographical location,
- a low participation rate in, and low power of, trade unionism.

The main disadvantages of the Czech economy from the foreign investor's point of view according to the survey are [Jahn, Zigic, 2001]:

- bureaucracy and officialdom,
- a bad transport infrastructure (a non-existent compact network of motorways),
- the low capacity of frontier offices and customs authorities,
- administrative hurdles and barriers,
- a poor educational system and its lack of orientation towards the needs of the production sector (especially manufacturing),
- a generous social system that does not motivate people to look for jobs and to start working.

In the next table we can see the development of CzechInvest's activities over the last decade in terms of project volumes in US dollars and newly created jobs.

Table 1: The Development of CzechInvest's Activities

year	Total CzechInvest projects		CzechInvest projects granted by GIIP	
	in mil. of USD	newly created jobs	in mil. of USD	newly created jobs
1993	12.5	570	0.0	0
1994	71.0	1392	0.0	0
1995	81.9	1323	0.0	0
1996	191.2	1995	0.0	0
1997	338.1	2137	0.0	0
1998	732.5	4142	692.1	1609
1999	910.4	7067	524.7	4550
2000	1561.3	18358	1333.6	7838
2001	2174.5	14412	1327.7	13211
2002p	1032.2	11767	1145.6	8220

Source: http://www.czechinvest.cz/ci/ci_cz.nsf/(ReasonsToInvestWD)/Vysledky?OpenDocument
http://www.czechinvest.cz/ci/ci_cz.nsf/(InvestmentIncentivesWD)/Introduction?OpenDocument

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[31] CzechInvest was awarded first place in the competition *"Investment Promoting Agency of the Year Europe"* in 2001 organised by the journal Corporate Location. Similarly prestigious *"Best European IPA Awards"* were conferred on CzechInvest by the jury of Strategic Direct Investor (a magazine for foreign direct investors) in 2003.

There was a gradual but remarkable increase in the volume of total CzechInvest projects and the number of newly created jobs during 1993–1997. The following period (1998–2000) was characterised by a sharp jump in both these figures. It seems that since 2001–2002 this very fast growth has reverted to stable development or even a slight decline in these quantitative dimensions of CzechInvest's activities.

Regarding the development of CzechInvest projects granted government investment incentives, they peaked in 2000 and 2001 – similarly to total projects – and are currently declining moderately.[32]

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[32] There are possibly several cases in the overview of CzechInvest's projects where there is a time lag between the announcement of a firm's intention to invest in the Czech Republic with the assistance of CzechInvest and the firm's request for a government investment incentive for that project. Consequently, a single project can be captured in two different years. Accordingly, the category *projects granted GIIP* does not always have to be less than the overall category *total CzechInvest projects* in terms of both project volume and newly created jobs, even though generally projects granted GIIP are a sub-aggregate of total projects announced. For the econometric procedures undertaken in the paper, only the category of *total CzechInvest projects* based on the date of announcement of a particular project will be used, and the above-mentioned time dissonance will not matter.

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