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CREATING A HOST COUNTRY-SPECIFIC MODEL OF THE RELATIONSHIP BETWEEN GROSS DOMESTIC PRODUCT AND INWARD FOREIGN DIRECT INVESTMENTS – THE CASE OF THE BULGARIAN ECONOMY

The significant theories in the study of the relationship between inward FDI and GDP are examined, taking into account the importance of multinational companies being heterogeneous firms for the economic development of the host country. The conclusion is reached that a universal model cannot be applied, and therefore a specific model is created based on the data taken from the Bulgarian economy. It is discovered that there are three significant variables that affect the size of the inflow of FDI: the percentage increase in the GDP during the previous period, the percentage increase in the accumulated FDI and the increase in the so-called risk premium. The introduction of the last variable in the model is theoretically substantiated, alternatively using the theory of the optimal capital structure and the analysis of the IS-LM-BoP model. An examination is made of the data on the Bulgarian economy which show that the growth in FDI inflows is inversely related to the growth of the GDP during the previous period and to that of the risk premium, but that it is directly related to the growth in the accumulated FDI. The conclusion reached is that the growth in the FDI inflows depends primarily on the ability of the host country's economy to create the necessary conditions to generate a sufficiently high return on FDI.

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Keywords: model of the relationship between economic growth and FDI; FDI productivity; required rate of return on FDI

The purpose of the study is to present a model explaining the change in the inflow of foreign direct investment (FDI) in the host country. The model is based on the hypothesis presented in previous research papers (Velushev, 2015) that inward FDI in the economy of the host country should be considered as a homogeneous financial flow seeking the same, sufficiently high rate of return. Compiling it will fill the gap between the interpretation of the macroeconomic importance of the FDI phenomenon and the understanding of the microeconomic effect for investors, reflecting the process of evaluating and implementing investment projects related to the required rate of return. In this sense, FDI growth should be seen as an effect of the ability of the host country's economy to generate economic growth, including in the form of an increase in investment income. It should be noted that the role of the growth of an economy in

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the growth of FDI has been theoretically justified in a number of research papers on this topic, however, at their core is usually the theory of the investment development path.

The investment development path theory (Dunning, 1981) links the level of economic development of the economies that are open to direct investments and FDI, linking the stage of economic development and the net accumulation of outward FDI. The development stage is measured through the GDP and the net accumulation of outward FDI is calculated as the difference between the accumulated outward and inward FDI. According to this theory, the countries that are open to FDI go through five stages of economic development, measured as the volume of the GDP, characterized by a certain level of net outward FDI, which means that investors will be guided by the level of the GDP of the host country, to determine what the expected return on the investment project will be.

Table 1

A summary of the investment development path theory introduced by Dunning and Narula (1996)

Stages	O-advantages	L-advantages	I-advantages	State of the industry	Government intervention
Stage 1	Small volumes of inward and outward FDI; Weak competitive advantages of local businesses	Weak technological base; Poor conditions for attracting FDI	Low level of demand for production	Undeveloped infrastructure; Poor production quality compared to that of foreign competitors; Labor intensive low-tech production; Protection of newly created industries	Control over imports
Stage 2 Slow growth in inward FDI; Small volumes of outward FDI	Increase in the competitiveness of local businesses	Increase in local benefits	Increase in demand for production by local businesses	Moderately knowledge-intensive production	Customs and other barriers; A more liberal FDI policy
Stage 3 More significant growth in outward FDI compared to that of inward FDI	Further growth of the competitiveness of local businesses	Increase in the per capita income; Demand for high quality goods	I-advantages emerge for local businesses	Decline in the share of labor-intensive industries; Wage growth	A liberal FDI policy and export orientation
Stage 4 Outward FDIs outpace inward FDI in absolute terms	High level of competitiveness of local companies on both the domestic and the foreign markets	High per capita income	Increase in the I-advantages for local businesses	Increase in capital-intensive industries	A liberal FDI policy
Stage 5 Inward and outward FDI grow in parallel	High level of competitiveness of local companies	High per capita income	Great I-advantages for local businesses	Global leadership in capital-intensive and high-tech industries	A liberal FDI policy; Promotion of outward FDI

The theory implies a certain degree of economic development in order for the local businesses to be able to accumulate O-advantages through which they can be competitive when they establish themselves on foreign markets where they can exploit location advantages (L-advantages). The act of direct investment, rather than

another means of taking up a share of the market (e.g. through export and licensing), implies the formation of a third advantage, I-advantage – a company that has created its own products, technologies and organization will strive to preserve them for itself instead of sharing them in the host country's local businesses, and this will be increasingly important the more advanced the O-advantages of the local businesses are. Through direct investment, the foreign investor performs an act of internalisation (I-advantage) by retaining the accumulated knowledge and skills (accumulated company O-advantages) and entering an economy which allows for the generation of even more company O-advantages in the competition with the local companies.

The concept of the advantages, known as Dunning's eclectic paradigm, entails that the multinational companies which have OLI advantages accumulate their profits through the efficiency created thanks to these advantages, thus achieving increasing returns based on their scale. Therefore, the need for a certain level of economic development of the host country becomes an imperative in terms of the location choice of FDI and explains why, despite the low wages and the tax and administrative benefits which they offer, the poorest and most underdeveloped countries do not actually attract this kind of investment. In other words, in terms of its location, foreign direct investment is driven, on the one hand, by the level of the existing physical environment in which local firms create economic wealth, defined as resources, capabilities and markets (RCM)[1], and, on the other hand, by the institutions established in the country in question, which determine the rules of the economic game of wealth creation (Dunning and Zhang, 2007).

By analysing the data taken from 117 countries, Dunning and Zhang reach the conclusion that the presence of formal (laws, education, knowledge, etc.) and informal institutions (traditions, culture, trust, reputation), and institutional enforcement mechanisms (self-regulation, fear, retaliation, punishment, enforced transparency, contract enforcement, etc.) is a more important motive for the location-based selection of inward FDIs than the physical environment or the RCM. It is the opinion of the author of the present paper that these conclusions should be considered in light of the required rate of return on FDI – both the physical environment and the existing institutions matter only insofar as they can provide a high rate of return. In this sense, neither the environment nor the institutions need to be comparable to those in the country of origin of the FDI, but rather they only need to ensure a high rate of return on the inward investment. This can be accomplished both by achieving production factor productivity (cost minimization) and by the ability of inward FDIs to earn high profits by exploiting market failures (e.g. external effects, monopoly, insufficient mobility of production factors and asymmetric information due to the abuse of a dominant position, no established rule of law, the administration's inclination toward corruption, etc.).

[1] Dunning and Zhang (2007) borrow the "resources, capabilities and markets" summary from North (2005).

The knowledge-capital model systemised by Markusen (2002), in which the existence of multinational companies is generally explained by the accumulation of knowledge-based assets in them, points to the same conclusions. The author cites two main reasons for choosing a direct investment over licensing a company that is local to the host-country to carry out the production of a foreign company. The first is related to the particular nature of knowledge-based capital, which accounts for most of the O-advantages of the foreign company. Markusen argues that any licensing to produce obtained by a local company will inevitably lead to an agency problem, since the licensed company will not receive as big of a return on investment as the foreign licensor would (in the very least because the licensee will have to make license payments) and therefore it will not have the same incentive to preserves the knowledge-based capital or the reputation of the product. According to the author, the second reason for choosing a direct investment over licensing is the possible inability of a foreign company to control the transfer of knowledge and technology to a local licensed company – that is, a direct investment is undertaken to counteract the potential of the local company to increase its own knowledge based-capital through imitation (learning-by-doing). Therefore, the decision to engage in FDI is based on the particularities of the accumulated knowledge-based assets, which are a way of generating economies of scale at the company level (internal economies of scale).

The knowledge-capital model is based on three prerequisites: fragmentation of the production activities based on the location of the knowledge-based assets of the multinational companies, the intensity of the exploitation of highly skilled labour in the individual production locations and the continuity, meaning that knowledge-based assets have the characteristics of public goods and are commonly and simultaneously used by multiple production units, which reduces their marginal cost. The model outlines some important features of multinational companies, namely that they are able to organise an effective internal vertical structure, dividing the production process into separate phases during which the knowledge-based capital has different manifestations. Thus, the efficiency of the production factors, manifested in the form of internal economies of scale, is achieved by exploiting different production factors which are abundant in the host countries. The genesis of this model can be found in the study by Carr, Markusen & Maskus (2001). It shows that the volume of production of the subsidiaries of multinational companies is a function of the sum of the GDP of the country of origin, the GDP of the host country of the FDI, the trade costs, the investment costs and the differences in the abundance of factors, and in particular that of skilled labour in the country of origin. Trade costs, in turn, depend on the distance between the two countries and the imposed protectionist constraints, thus the model also endogenizes the variables of the gravitational model of international trade. Although the quality of the institutions is not discussed here, it is assumed by the level of the GDP. From a return perspective, FDIs will seek a host country that would allow them to base there the part of their vertically integrated structure that will deliver the highest returns, exploiting the local institutions, factors

and abundance of resources. In this situation, the knowledge-based capital of the local part of the multinational company may lie in the ability to achieve the required rate of return to identify and exploit the local peculiarities obtained in other host countries.

It is clear that multinational companies are different from local ones even in that they are able to maintain high competitiveness both domestically and globally. Such companies are able to use international trade as a catalyst for their expansion from the local to the multinational level, while still maintaining their productivity (Melitz, 2003). However, because not all local businesses succeed in developing this model, they can reasonably be described as heterogeneous in terms of their productivity. The reason for the heterogeneity in the productivity of companies is not clear (Melitz compares it to a black box), but their impact on international trade and production is indisputable.

From the point of view of FDI theory, the existence of heterogeneous firms is crucial because it goes beyond the atomistic[2] approach to the competition between companies on the international market and accepts the existence of granular firms that can influence both the international market and the national economies in order to ensure the heterogeneity of their productivity. Melitz and Redding (2015) are convinced that this is a heterogeneity that goes beyond simple differences in the cost of production.

There is another less discussed aspect of the existence and development of heterogeneous firms – the idea of X-efficiency (see Leibenstein, 1966), which is now part of the theory of industrial organization. X-efficiency refers to the unexplained part of the efficiency that some companies achieve when allocating resources in the face of competition, or even more clearly – the problem that companies protected from competition will not be effective, i.e. they will not minimize their costs to the extent that classical price theory implies. The author of this theory attributes the existence of X-efficiency to the differences in the companies' motivation to generate profits, i.e. the magnitude of the agency problem in each particular company. The present paper takes the stance that the problem of the X-efficiency of the companies in a given economy is significant in terms of the foreign direct investments, because it shows that foreign companies do not necessarily need to be allocatively efficient – they simply need to be more motivated to take up a market share and generate profits than the domestic companies. In a narrower sense, the fact that heterogeneous firms are competitive in international production means that each of them has found its own motivation and a way to use the market conditions in order to achieve high returns, first on the domestic market and then on the international market. In other words, although it is not known how they do it, it must be assumed that inward FDIs strive to achieve a rate of return corresponding to the high rate of return characteristic of heterogeneous firms.

[2] All companies participating in the international market are small enough and their market share is close to zero, i.e., they cannot affect market prices and quantities.

This again leads to the theory of the investment development path – an underdeveloped market economy cannot provide opportunities for local companies to develop O-advantages because there are no institutions in place to guarantee ownership of the knowledge-based assets and it cannot provide sufficiently profitable opportunities for profit from market failures. In such an economy, foreign companies avoid direct investment and prefer imports. Over time and with the increase in aggregate income, the economic institutions develop and create opportunities for local businesses to increase their competitiveness. The rise in the prices of the factors leads to richer consumers, a more generous budget and more investment opportunities. Relying on their strong motivation and the established local institutions, FDIs are beginning to emerge, attracted by a growing economy where they can exploit their specific skills to achieve their own high required rate of return. As a result of this increased investment activity, the gross domestic product of the host country continues to grow. In such an environment, the local companies are forced to create their own advantages in order to withstand foreign competition. The process of building local heterogeneous firms begins with the formation of own knowledge-based assets that imply the availability of highly skilled labor, capital-intensive technologies and specific knowledge of local institutions. The economy is already at a stage where the GDP is comparable to that in other developed economies. The inward and outward FDIs are high enough and attest to the fact that, on the one hand, the local economy provides investment opportunities with a sufficiently high rate of return, and, on the other hand, the local firms are already competitive on the international market and are capable of achieving high returns on foreign markets. The present paper is of the opinion that herein lays the explanation for the paradoxically large variety of conclusions in the analysis of the relationship between the GDP of the host country and the inward FDI.

There are numerous studies of data from different countries. From their results, it becomes clear that the relationship between the GDP and the inward FDI varies, i.e. for each particular host country it may be either bidirectional or unidirectional in each direction (see Chowdhury & Mavrotas, 2006; Esso, 2010).

The analysis of the data for Bulgaria shows that there is a unidirectional relationship between the two variables, namely that GDP growth causes FDI growth (see Simionescu, 2016). A previously conducted analysis of trend stationary data using Granger's Causality test on the relationship between the components of the GDP and the inward flow of FDI for Bulgaria (see Velushev, 2016) shows that the FDI flow combined with past values of the explained variable must precede (must have a Granger cause with lag 3 for) the increase in total private consumption, the gross capital formation and the net exports, and vice versa – no need was found for a precedence of the GDP components in order to increase the FDI flow. It is the author's opinion that this is a sign of a certain level of economic development of the host country.

The result is consistent with the theory of the investment development path, demonstrating that the country is at a stage where an increase in the flow of inward

FDI is a reason for improving the economic well-being of the suppliers of manufacturing factors, however, the welfare is not sufficient enough in order for local heterogeneous firms to emerge and for the economy to move on to a higher phase of development. This explanation for the paradox that the flow of inward FDI combined with the effect of the size of the explained GDP component itself must precede the increase in the value of that component of the GDP, with a significant lag at that, points to some kind of multiplication effect, where the inward FDI serves as the basis for a process that causes a change in the internal demand for production factors, which in turn causes changes in the internal demand for goods and services with a corresponding lag. The cumulative effect of the FDI flow and the changing internal demand for production factors, goods and services generates a production capacity and will eventually lead to the emergence of X-efficiency in local firms. Thus, the accumulation of FDI is a decisive factor in the economic development of the host country.

The different approaches and models describe economies with different degrees of development, and any attempt to create a universal model that explains the data for all the economies is an impossible task, even if only in order to create a structural model of the direction and parallelism of the link between economic growth and inward FDI, taking into account the stage of development of the host country, it would have to include complex economic phenomena such as the specific foreign trade policies of the trading partners, the frequency and magnitude of on-going market failures, the intertemporal aspect of consumer improvement, the effect of education on the growth in aggregate demand and aggregate production, etc. Thus, even if suitable statistical series are found for such variables, the model of the relationship between economic growth and FDI becomes a nonlinear complex dynamic system, while, from the point of view of chaos theory, the deterministic nature does not mean that the system has a predictive power.[3] These arguments lead us to accept the idea that the relationship between FDI and economic growth depends on the specific characteristics of the host economy, i.e. that each link model is valid only for the analysed country.

There are a number of studies and analyses on the various aspects of the impact of inward FDI on Bulgaria's economic development. They can be divided into two groups. The first one discusses microeconomic settings that present the importance of dispersal and imitation effects for the complexity of domestic production. They make it evident that, as a source for technological transfer (Djarova, 1996), FDIs are a tool for the formation of economic and civilizational strategic partnerships (Jordanova, 1999) and that they have played a major role in determining the industrial structure of the economy through their active participation in privatization (Mladenova, 2006). This group of studies is of systemic importance because it

[3] This is especially true for long periods and Kellert (Kellert, 1994, p. 33) calls it "predictive hopelessness". Thus, each model of the relationship between GDP and FDI is of predictive importance only for the immediate future and the distant perspective remains unclear because of the butterfly effect.

reflects the ability to absorb organizational forms and to utilise new technologies in the host country (the so-called absorptive capacity or the host country's ability to generate benefits from inward FDI, expressed through the specialisation in the production of more complex goods). This ability depends on the existing level of sophistication of consumption and on the qualities of the human capital. However, the motives behind inward FDI in Bulgaria are marked by the specific features of the host country. Bitzenis (2003) gives Greek investors, who have an advantage over Western European ones because they have knowledge of obstacles such as red tape and corruption and can thus overcome them more easily, as an example. It is the author's opinion that these are some of the characteristics of the X-efficiency or heterogeneity of the Greek companies investing in Bulgaria. This group can be summarized if we accept that it examines the question of what attracts FDI in a particular host country.

The second group of studies addresses the question of what results from attracting FDI to the host country. They analyse the macroeconomic variables in an attempt to create a model of the relationship between inward FDI and the economic growth of the host country. The successful creation of such a model would mean that instruments for impacting economic growth can be defined, setting quantitative targets for growth accounting. To this end, data relating to the motives for the entry of specific FDIs should be aggregated and considered as a homogeneous financial flow. Thus, some analytical information at the microeconomic level is lost, but at the same time macroeconomic policy instruments are being built. Such studies on the Bulgarian economy are rare and differ in their fundamental nature, because they test a number of theoretical models against the statistical data on the relationship between the inward investments and the economic growth of the host country.

One of the most comprehensive studies of the role of incoming FDI in the growth of the Bulgarian economy was published by Petranov (2003). From the models that are created and tested in it, it becomes clear that the growth rate of the inward FDI depends on the growth rate of the real GDP and on the growth rate of the accumulated FDI[4] as an alternative indicator for the business climate in the host country. Interestingly, the real interest rate (calculated by adjusting the interest rate on long-term bank loans in BGN with the consumer price index) is not listed as a statistically significant independent variable here. The study helps to identify two statistically significant independent variables that influence the rate of inward FDI. The impact of the GDP growth has already been examined and, from the discussion on the impact of the FDI flows on the GDP components and the supposed multiplier effect, it can be concluded that the inward flow of FDI will be influenced by the volume of FDI already accumulated in the country in line with the investment development path theory.

[4] The study also uses the European Bank for Reconstruction and Development (EBRD)'s transition index, however, it was found that the cumulative FDI and the transition index are alternative and interchangeable variables in terms of their impact on FDI. As we already have data on the cumulative FDI, we will be using this metric here.

From the point of view of the already discussed high required rate of return on the investment projects of heterogeneous firms, it can be assumed that a third variable must be considered – the maximum possible return that heterogeneous firms can achieve in the host country's economy. The logical starting point for determining this required rate of return on FDI is the understanding that they must achieve the maximum possible return that can be generated in each particular host country. Having a high rate of return for local investors is a good indicator that the foreign investment projects will be able to generate their required rate of return[5]. The argument that different rates of return can be observed across the different industries bears no relation to the required return on foreign direct investments. Profit margins are a factor in pricing, while the returns on FDI are a function of the whole range of production, organizational and financial instruments used by heterogeneous firms.

Analysis

The question of the relationship between inward FDI and the GDP of the host country in terms of the established investment theory will be approached by looking for evidence in the Mundell-Fleming open economy model[6] that looks at the simultaneous equilibrium of the real, financial and external sectors of the economy. Mundell (1963) makes the assumption that the interest rate level is an exogenous variable and that, in the presence of perfect capital mobility, the internal interest rate will be equal to the global one. During the formulation of the original open economy model, the need to disintegrate the capital flows in the capital[7] account of the host country into different sources of capital in order to cover the current account deficit – FDI, portfolio foreign investment, government loan, private debt and cash transfers – was not yet realised. However, this concept of the homogeneity of the capital flows was formally abandoned in the wake of the 2008-2009 global financial crisis, with the change in the International Monetary Fund (IMF)'s[8] views on the need for capital flow management through the application of capital control measures.

It is assumed here that the differentiation of the capital flows logically leads to a difference in the prices of their different types. Therefore, it is the author's

[5] By analogy with the Lucas Paradox.

[6] Mundell-Fleming, or the IS-LM-BoP model for an open economy.

[7] For the purposes of the present research, the broad meaning of the term "capital account", which is also used in the Mundell-Fleming model, is used here, according to which the balance of payments is divided into two parts – the current account and the capital account. In this version of the meaning, the capital account balance indicates the net capital flows, including debt and investments, which offset the current account balance made up of the trade balance and factor income. The idea of offsetting the balances is also advocated in the modern split of the balance of payments into three parts, which was initiated by the IMF and adopted by EU countries.

[8] See IMF, 2012.

belief that the global interest rate used in Mundell's IS-LM-BoP model, in assuming the existence of perfect financial mobility, is an over-simplification and does not take into account the nature of the reasons behind foreign direct investments. This means that, based on their heterogeneity, multinational companies pursue approximately the same sufficiently high expected return on international production (see Velushev, 2015). However, international loans and equity transfers do not have the same required rate of return because they do not have the same motivation and they do not take on the same risks. Therefore, the location choice of the FDI is related to the local and international interest rates only insofar as it can influence the weighted average cost of the capital with which they finance a specific investment project. Thus, the low domestic interest rates on loans will only mean that the foreign companies will borrow on the domestic and not on the international market (Desai, 1998). The aim is to reduce the weighted average cost of a FDI resource, which has two sources – own and attracted capital, by ensuring a debt/ total ratio that would maximise the return on the investment project through a leverage effect.

According to the Trade-off theory of optimal capital structure, if the investment project's earnings are not volatile, the benefits of using attracted capital to maximize investor returns will be such that they will determine a capital structure with a high debt/total capital ratio (see Brunen, Jong & Koedijk, 2006). FDI, as part of international manufacturing and trade, by default has a less volatile revenue than local businesses in the same industry, making them a preferred partner of local lenders. The fact that the risk of possible non-payment on loans in corporate lending is further compounded by the asymmetry of information, the number of agency problems and the transaction costs that arise from the practice of filing for bankruptcy as a result of corporate insolvency, which can often be seen in Bulgaria, should also be taken into account. Thus, the less volatile FDI revenues can certainly be defined as a reason behind the reduction of interest rates on loans for them, and furthermore, in order to attract FDI, the state and the municipalities often provide them with additional opportunities to increase their returns in the form of tax breaks, supplemental investments in infrastructure and training, as well as access to grants under the Structural Funds.

It turns out that the domestic interest rate on loans carries information about the FDI returns, showing the cost of one of the sources of their financing. In this case, in order to account for the leverage effect, it must be assumed that there is a reverse correlation between the interest rate and the return on the investment project, i.e. when the interest rate is low, the borrowed capital in the capital structure is higher, which in turn increases the return for the project investors. This is where the cyclicality of economic development should be disregarded and, to this end, the trade rate will be divided into two parts – the risk-free rate and the risk premium[9]. This is necessary in order to eliminate the effect of the monetary countercyclical policy on the lenders'

[9] The difference between the long-term interest rate on loans to non-financial corporations and the interest rate on overnight deposits on the interbank market, expressed as a percentage.

decision to extend credit. The basic interest rate is one of the main instruments by which the central bank influences the economic activity through the supply of money. However, these instruments only aim to offset the short-term fluctuations around the long-term trend of economic growth, whereas the investment horizon of direct investments is far broader.

Therefore, in our opinion, the current phase of the economic cycle should not play a decisive role for the investment decision, therefore the difference between the long-term trading interest rate (which is better suited to the investment horizon) and the base interest rate will be of greater importance when it comes to the FDIs. In effect, it should be accepted that in order to evaluate the return on FDI, it is only necessary to have information about the interest rate on long-term bank loans and about the interest rates of demand deposits on the interbank market. Thus, it is left up to the creditors to carry out a systematic study of the ability of the business, and of the FDI in particular, to generate a steady income and to pay up the credit provided to them, relying on the logic that granting a long-term credit resource at a certain interest rate reflects the creditors' analysis of the borrowing company's ability to use the leverage effect to generate a persistently high long-term return in a particular economy.

Because the long-term interest rate or more specifically its risk component, is expected to influence the volume of incoming FDI, the construction of the model will start with the introduction of the indisputable independent variables into it first. The log-logarithmic[10] model of the relationship between economic growth and inward FDI, which is based on the data on the Bulgarian economy from Petranov's study (2003), show that only two variables, "GDP" and "cumulative FDI", are significant independent variables.

However, when testing the statistical data for the period 1999-2017, information was obtained on a missing variable (see Appendix 1). Given the above, it is logical to include the risk premium from the nominal interest rate on long-term loans as an independent variable. In Petranov's study (2003), the impact of the long-term interest rate indicator was estimated to be insignificant – in it, the indicator was taken without being adjusted with the risk-free rate, however, it was adjusted with the consumer price index. The present study accepts that, as an independent variable, the correction with the consumer price index is unnecessary from the perspective of the IS-LM-BoP model, because in order to cover the current account deficit (to pay the price of the net imports) a demand for money will emerge in the economy, i.e. the credit and investment activity in the capital account will be intensified. According to the classic Hicks function, the demand for money depends on the nominal interest rate and the real GDP, therefore the inward capital flows appear to be autonomous with respect to the real interest rates at the time of entry. This is especially true for the inflows into an economy with a fixed exchange rate where

[10] Data from time series for variables such as "cumulative FDI" and "GDP" are logically non-stationary, and the model should take this feature into account.

the presence of internal inflation will not only fail to reduce the expected return on FDI, but on the contrary – it will provide them with an additional cheap financial leverage resource.

After adding the indicator of the expected return on the economy as a factor for determining the required rate of return on FDI to the source model, the log-logarithmic model is obtained (see Annex 2):

(1) $$\ln FDI_t = \beta_1 + \beta_2 \ln real\ GDP_{t-1} + \beta_2 \ln FDI\ STOCK_t + \beta_3 \ln RISK\ INT_t + \varepsilon,$$

where *FDI* is the inward FDI flow; *GDP* is the gross domestic product; *FDI STOCK* is the accumulated net FDI; *RISK_INT* is the difference between the long-term interest rate in EUR on loans to non-financial corporations and the overnight interest rate deposits in EUR on the interbank market as an approximation of the risk-free rate.

The tested model shows that the FDI growth rate during the current period depends on the GDP growth rate during the previous period, the growth rate of the accumulated FDI during the current period, and the growth rate of the expected credit risk premium during the current period. From the regression analysis it becomes clear that the three independent variables can be used to predict the change in FDI growth. As is to be expected, there is an inverse correlation between the risk premium in the interest rate and the FDI flow. As already stated above, a low interest rate means a higher return on FDIs and will lead to an increase in their inflow.

An interesting inverse relationship (negative elasticity) is established between the rate of change in the inward FDI flows and the rate of change in the real GDP. This seemingly counterintuitive result has its explanation that is related to domestic prices. To demonstrate this, a reworking of the Keynesian national income equation will be used to establish the total resource availability over the reporting period, namely the GDP plus the imports, which is equal to the domestic resource absorption plus the exports:

(2) $$Y + M = C + I + X + G.$$

The rate of personal and public consumption is replaced with the rate of savings ($S = Y - C - G$) and the result is, as follows:

(3) $$I = S + (M - X).$$

It is clear that a possible increase in imports will stimulate investment, but the price of such an increase will be the outbound local income towards trading partners and the high domestic prices, and this situation will obviously result in a subsequent decrease in the aggregate demand for goods and services. Thus, the period of decline in the GDP will mark a fall in resource prices and the beginning of an increased investment activity, wherein, according to the test data from the model presented here, the lag between the decline in GDP and the increase in the inflow

of FDI will occur within the span of one year. This delay can be explained by the transmission mechanism related to the interest rates. To this end, the link between the inward FDI and the GDP will be presented through the IS-LM-BoP open economy model, in which the current and financial accounts are equal to:

(4) $$BoP = CA + KA = (M - X) + (I - S) = 0.$$

We know that *KA* depends on the degree of international mobility of the capital (*K*) and on the choice of location, which implies that the expected return on capital inflows from a particular economy (*r*) outweighs their alternative returns from the rest of the world (*r**):

(5) $$KA = K(r - r*).$$

Equations (2) and (3) show that investments in the economy are financed by the savings and the balancing cash flow in the capital account,[11] which offsets the current account deficit. Equation (2) can also be used to determine the overall return on investment – this is a weighted combination of the real interest rate on deposits and the cost of the financial account flow that balances the current account balance. In order to explain why this is a price rather than an interest rate (as the original analysis of the LM curve implies) equation (4) will be used – while the Mundell-Fleming model assumes, as can be seen from equation (5), that the capital flows balance the current account deficit by way of the difference between the equilibrium interest rate in the host country and that in the country of origin (international interest rate), the present paper takes the stance that the size and structure of the inward flow of capital depends on the expected return on each of the inward flows of capital. This means that we distinguish between two flows – that of the loan capital, which is subject to the rule of the preference for domestic over international interest rates, and that of the investment capital, in which returns depend on the economy's need to grow, represented by the slope of the LM curve. The need for additional financing implies that opportunities for achieving a high rate of return must be identified, however, this would require enough time for the lenders to change their expectations for the future and to reduce the interest rates on loans, which will serve as a signal to investors that the expected rate of return is increasing and that when it reaches the required rate of return the inward FDI flow becomes a fact.

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First of all, it should be noted that the creation and testing of a specific model demonstrates ability to explain the relationship between the flow of inward FDI and the economic growth of the Bulgarian economy. This means that if the conditions

[11] For the sake of convenience, it is assumed that the capital transfers portion, which predominantly consists of funds from the Structural Funds, is a constant.

for their appearance in the host country, namely if the financial result of the FDI or the expected return on the investment project is sufficiently high, is taken into account – the change of growth of this indicator can be manipulated. It is important to understand that the specifics of the host economy and the ability of local economic agents to produce complex, differentiated commodities with high added value, as well as the abundance of loan capital, will be key for achieving a return on FDI.

FDIs are made by heterogeneous firms – international companies that have accumulated O-advantages which make them more competitive than local companies. It is typical for businesses that are capable of investing abroad to be able to carefully evaluate the host country's ability to provide them with a high expected rate of return as a result of the exploited advantages for the foreign investor over a sufficiently long period of time. Thus, from the point of view of the macroeconomic analysis of the aggregate data, reaching the highest possible return in the host country's economy is a sufficient criterion for the homogeneity of the inflow of FDIs, playing the role of a symbolic common denominator, allowing for the different investment projects by foreign investors to be treated as a homogeneous capital flow of inward FDIs measured at a given time for a particular host country.

It is the author's opinion that this rule applies to any economy receiving FDI, wherein their choice of location is made by analysing the expected rate of return that they can generate under the existing conditions in the host country's economy. To achieve this return, the foreign companies rely on the X-efficiency related to their motivation to succeed. In other words, when deciding which host country to invest in, foreign investors try to determine whether they will receive their required rate of return while relying on their own advantages which will be exploited in accordance with the particularities of the specific economy.

From the point of view of a macroeconomic frame, these conclusions can be used to formulate a policy on attracting FDIs with a view to creating a balance between spending and achieved impact. In other words, when a country's economy is growing, the efforts to attract FDIs will be more expensive and inefficient because in the conditions of a high volume of domestic investment and active domestic demand for goods and services the competition in the investment market is high, which means that the expected returns FDIs will decline and they will not enter the said economy. At the same time, a weak or even negative economic growth, which implies low activity of domestic investors and an abundance of cheap production factors, providing prerequisites for high expected returns on FDIs, would serve as a favourable or effective moment for attracting FDI. This result can be utilised by both macroeconomic policy makers and researchers seeking a systematic place for FDI as a means for improving the economic well-being in the host country.

The issue of the mentioned multiplier effect of the flow of FDI on some components of the GDP is interesting, however, it is a topic to be explored separately in the future.

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Appendices[*]

Appendix 1

Estimation Command:
==========
LS LOG(FDI_FLOW) LOG(FDI_STOCK) LOG(GDP(-1)) C
Estimation Equation:
==========
LOG(FDI_FLOW) = C(1)*LOG(FDI_STOCK) + C(2)*LOG(GDP(-1)) + C(3)
Substituted Coefficients:
==========
LOG(FDI_FLOW) = 2.94261338825*LOG(FDI_STOCK) - 6.20557395423*LOG(GDP(-1)) + 42.3428184346
Dependent Variable: LOG(FDI_FLOW)
Method: Least Squares
Date: 04/21/19 Time: 08:58
Sample (adjusted): 2000 2017
Included observations: 18 after adjustments

Variable	Coefficient	Standard error	t-statistics	Probability for error
LOG(FDI_STOCK)	2.942613	0.560992	5.245378	0.0001
LOG(GDP(-1))	-6.205574	1.203132	-5.157849	0.0001
C	42.34282	7.105581	5.959093	0.0000

R-squared	0.647638	Mean dependent var	7.540197
Adjusted R-squared	0.600657	S.D. dependent var	0.808021
S.E. of regression	0.510617	Akaike info criterion	1.644619
Sum squared resid	3.910950	Schwarz criterion	1.793014
Log likelihood	-11.80157	Hannan-Quinn criter.	1.665081
F-statistic	13.78496	Durbin-Watson stat	1.896401
Prob(F-statistic)	0.000400		

[*] **Clarifications regarding the data and models used**

The statistics on long-term interest rates on loans to non-financial corporations used as an indirect indicator of the return on investment are aggregated by the collecting institution – the BNB (www.bnb.bg, last accessed on 6.05.2019), in accordance with its methodology, as average monthly values. This necessitates their further processing in order to achieve their unweighted average annual values, thus losing specific information as a result of the aggregation.

All models demonstrated in the applications are log-log and selected according to the "Goodness to fit" criterion – which is the best fit for the statistics. The cumulative FDI data for Bulgaria are taken from the UNCTAD database, https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=96740 (last accessed on 21.04.2019) and are converted from USD using the United States Federal Reserve's annual average exchange rate, https://fred.stlouisfed.org/series/DEXUSEU#0 (last accessed on 21.04.2019). The GDP data in EUR are taken from Eurostat, https://ec.europa.eu/eurostat/data/database (last accessed on 21.04.2019). The data on the effective interest rates are taken from the website of the BNB, http://bnb.bg/Statistics/StMonetaryInterestRate/StInterestRate/StIRInterestRate/index.htm (last accessed on 21.04.2019), where those for the period that ended in 2006 have been converted into the average annual effective interest rates on loans to non-financial corporations in EUR with a maturity of more than one year, regardless of the size of the loan; and the data from the beginning of 2007 to 2017 have been converted into average annual effective interest rates on loans to non-financial corporations in EUR with a maturity of more than 5 years and amounting to over EUR 1 million.

Appendix 2

Estimation Command:
==========
LS LOG(FDI_FLOW) LOG(FDI_STOCK) LOG(REAL_GDP(-1)) LOG(RISK_INT) C
Estimation Equation:
==========
LOG(FDI_FLOW) = C(1)*LOG(FDI_STOCK) + C(2)*LOG(REAL_GDP(-1)) + C(3)*LOG(RISK_INT) + C(4)
Substituted Coefficients:
==========
LOG(FDI_FLOW) = 1.85135208029*LOG(FDI_STOCK) - 4.01470947844*LOG(REAL_GDP(-1)) - 1.47880075312*LOG(RISK_INT) + 33.1848320241

Dependent Variable: LOG(FDI_FLOW)
Method: Least Squares
Date: 05/05/19 Time: 19:35
Sample (adjusted): 2000 2017
Included observations: 18 after adjustments

Variable	Coefficient	Standard error	t-statistics	Probability for error
LOG(FDI_STOCK)	1.851352	0.442031	4.188290	0.0009
LOG(REAL_GDP(-1))	-4.014709	0.890549	-4.508129	0.0005
LOG(RISK_INT)	-1.478801	0.463501	-3.190504	0.0065
C	33.18483	4.681305	7.088800	0.0000

R-squared	0.813879	Mean dependent var	7.540197
Adjusted R-squared	0.773995	S.D. dependent var	0.808021
S.E. of regression	0.384132	Akaike info criterion	1.117471
Sum squared resid	2.065808	Schwarz criterion	1.315332
Log likelihood	-6.057242	Hannan-Quinn criter.	1.144754
F-statistic	20.40658	Durbin-Watson stat	3.009915
Prob(F-statistic)	0.000022		

13.05.2019