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Effects of Foreign Direct Investment on the Irish Economy. An Econometric Analysis of the GDP and of the Determining Factors of the Inflow of Foreign Direct Investment into Ireland

Abstract

The main goal of our analysis in this article is the examination how the foreign direct investment influences less developed regions of the EU, especially the economy of the Member States where there are based.

We try to verify the thesis that the economic growth of Ireland depends in a high degree on the capital inflows in form of FDI. Moreover we examine which factors attract the foreign investors to locate their business in Ireland.

To proof the relation between inflows of FDI and possible factors determining this inflows, an appropriate econometric model has been chosen.

There are two important indicators, which strongly confirm that the foreign capital plays a huge role in the economic growth of Ireland. The first one is the enormous part of foreign capital in creation of GDP, in comparison with other Member States, and its high relation to total investments.

The detailed analysis of the invested capital in Ireland shows that the high technology industry employees well qualified labour force which means that such industries like software production, pharmacy and biotechnology are interesting for foreign investors. In these industrial branches Ireland is an important world exporter. Moreover, the use of the new imported technologies and the local resources creates new jobs.

The stable political and social situation, economic and technical infrastructure, qualified labour force and tax preferences for foreign investors are the most significant factors determining the inflow of FDI to Ireland.

Introduction

The quantity of foreign direct investment (FDI) capital that is distributed throughout the global economy each year has become so large[1] that it would be difficult not to take into account the economic consequences of this inflow of foreign capital in each particular affected country. Economists and politicians continue to weigh the dangers and benefits of the existence of FDI in developing countries as well as in those undergoing systemic transformations. The rapid rate of increase of the stream of FDI into these countries, especially visible in recent years, constitutes good reason for conducting a study on this topic.

The aim of this article is to examine the economic effects of the inflow of direct investment into the host country's economy, and in particular the effects that these investments have on regional growth in the less developed EU Member States.

In this report, we will attempt to prove the thesis that Ireland's economic growth is dependent on the inflow of capital in the form of foreign direct investment. An analysis of the various factors that attract foreign investors to Ireland has also been conducted.

1. Ireland: a less developed region of the EU, yet an area of capital expansion

The economic changes that are currently taking place in Ireland began in the early seventies, although they have become especially significant during the last decade. Ireland, a country that until recently was considered economically backwards, is today experiencing an unprecedented economic boom. Highly technological industries based on very specialized knowledge have become particularly active on the market, and they are capable of successfully competing with foreign markets.

According to analyses of FDI, there are both positive and negative economic consequences of this type of investment for the country that receives the capital[2].

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[1] According to World Investment Report 2000, capital inflow in the form of FDI was about 800 million USD in 1999. It should be noted, however, that the annual FDI stream is "driven" by mergers and acquisitions between highly developed countries.

[2] See among others: J. Witkowska, Bezpośrednie inwestycje zagraniczne w Europie Środkowowschodniej (*Foreign direct investment in Central and Eastern Europe*), Łódź University Press, Łódź 1996, W. Dziemianowicz, Kapitał zagraniczny a rozwój regionalny i lokalny w Polsce (*Foreign Capital and Regional and Local Development in Poland*), University of Warsaw, Warsaw 1997.

It can be said generally that all countries that have decided to accept foreign capital attempt to diminish the negative effects of the activities of international concerns by legal and administrative means. Too many such limitations, however, can discourage foreign investors, especially if other factors such as market size, geographical location and natural resources do not fully compensate for the difficulties imposed on them by this type of limitation.

Table 1. Economic Development Indicators for Ireland Between 1987 and 1997

Specification	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
GDP [3]	4.7	5.4	5.9	8.4	1.3	3.7	2.9	6.8	9.8	8.5	8.0
Consumption[4]	3.3	6.1	6.0	2.2	2.2	4.1	2.2	6.1	4.2	6.5	7.0
Gross investment[5]	-1.1	0.4	12.9	10.4	-7.4	-1.3	-3.4	10.2	9.6	16.0	14.0
Export[6]	13.7	9.0	10.3	8.7	5.3	13.6	9.6	14.2	19.6	10.1	12.0
Unemployment[7]	16.6	16.1	14.7	13.4	14.8	15.4	15.6	14.3	12.3	11.6	10.1
Inflation[8]	3.1	2.1	4.1	3.3	3.2	3.1	1.4	2.3	2.5	1.7	1.5
Wages[9]	6.1	4.3	3.9	4.5	5.6	4.6	5.8	1.8	2.2	3.5	2.3
Balance of Payment[10]	-0.2	0.0	-1.6	-0.8	0.8	1.1	3.9	2.8	2.8	2.0	1.7
Budget deficit[11]	-8.5	-4.5	-1.8	-2.3	-2.3	-2.5	-2.4	-1.7	-2.1	-0.4	0.6
Interest rates[12]	10.8	8.0	10.0	11.3	10.4	14.3	9.1	5.9	6.2	5.4	6.0
Interest rates[13]	11.3	9.5	8.9	10.1	9.2	9.1	7.7	8.2	8.3	7.5	6.5

Source: DIW Berlin, Wochenbericht 13/98.

[3] Changes expressed in percentages in relation to the previous year, in 1990 prices.

[4] Ibid.

[5] Ibid.

[6] Ibid.

[7] Expressed in %.

[8] Changes expressed in % in relation to the previous year.

[9] Per hour in industry, changes expressed in % in relation to the previous year.

[10] Expressed in % of nominal GDP.

[11] Expressed in % of nominal GDP.

[12] Short-term, expressed in %.

[13] Long-term, expressed in %.

Ireland is among those countries very supportive of and eager to engage in foreign investment growth in their economy. In 1969, it established the IDA (International Development Agency) in order to attract foreign capital. The investor would negotiate all his issues regarding the establishment of an enterprise in Ireland directly with IDA[14].

When observing the Irish economy over a long period of time, one will notice a particularly strong growth characteristic. In 1985, the balance of payment was – 2.15 million Irish Pounds[15], and by 1997 there was a budget surplus of 289.7 million. The unemployment rate in 1985 was 17.7%, and by 1997 it had dropped to 10.1%. By 1997, positive macroeconomic indicators dominated the scene (see Table 1).

As of this day, no EU Member State has accomplished as high a rate of economic growth as Ireland has. The economic conditions only slightly worsened between 1991 and 1993 (during the European recession, which primarily affected Great Britain[16]), which manifested itself as a decline in investment, among others. Thanks to an increased rate of export growth and private consumer expansion, however, it was possible to maintain a significant level of economic development. What then, one should ask, were the deciding factors that defined Ireland as the country with the highest rate of economic growth, the lowest inflation, and the smallest budget deficit in Europe[17]?

In the early 1970s, the Irish per capita GDP was only 60% of the EU average. In 1999, it surpassed the average GDP in the EU by 11%, and is now higher than that of Great Britain[18]. Ireland has experienced the greatest GDP gain in the world, which is also evidence of its dynamic growth (compare Table 2).

[14] IDA, annual report 1998.

[15] About 2 billion USD, according to the EUROSTAT exchange rate, Luxembourg: www.dsidata.com/cgi/local/pocket.pl

[16] This had an undeniable effect on the Irish economy, since it is highly dependent on the economy of Great Britain.

[17] In 1986, *The Economist* ran a supplement entitled, "The Poorest of the Poor". Ten years later, the same periodical entitled the same supplement, "Europe's Star" (translator's note: Titles translated from Polish).

[18] OECD Economic Outlook, June 1999.

Table 2. Real GDP gain in 1998, in selected countries

Country	GDP Gain
Ireland	10.4%
Great Britain	2.1%
France	3.2%
Germany	2.8%
Holland	3.8%
Spain	3.8%
Portugal	3.9%
USA	3.9%
Japan	-2.8%

Source: OECD Economic Outlook, June 1999, p. 96.

The following are considered to be reasons for Ireland's economic progress[19]:

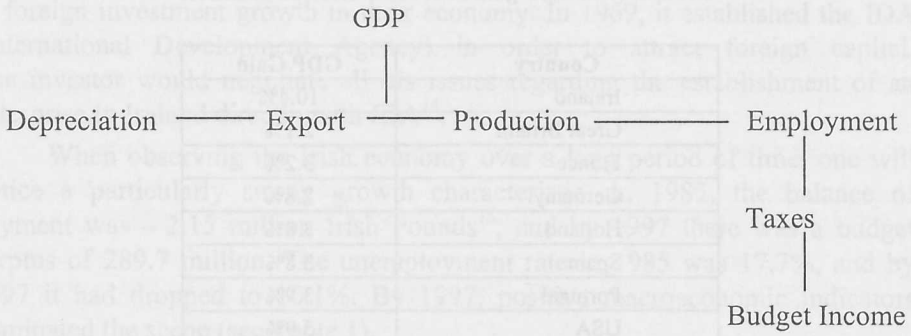
- **Effective earnings, monetary, and currency policies**

The beginning of positive economic returns for Ireland began during a period of real depreciation of the Pound and liberalization of monetary policy. Ireland's economy was mainly concentrated on export during this time (a high level of export is maintained to this day). Taking advantage of the positive effects foreign capital had on their economy, Ireland is becoming a world leader in export. It should be noted that enterprises that invest foreign capital in Ireland themselves receive comparable benefits (they have access to cheap labor and investment preferences usually in the form of tax deductions). Thanks to this combination, their products are of high quality and can compete on foreign markets[20]. The economy was inspired by export growth to increase production, and the export of goods and services came to constitute 2/3 of Ireland's GDP – today that number is as high as 4/5. Ireland's competitiveness has improved as a result of a low nominal and real rate of currency exchange, which can be seen in the balance of payment surplus that has been holding fast since 1991 (see Table 1).

[19] See J. Bredlay, K. Whelan: *The Irish expansionary fiscal contraction. A tale from one small European economy*. in: Economic Modeling, No. 14/1997, p. 175.

[20] *Ireland: a business and investment guide,* PricewaterhouseCoopers 1998, p. 2.

Diagram 1



Source: Author's own work.

- **The influx of foreign capital in the form of FDI**

As a result of the liberalization of monetary policy in the mid-1990s (stable wage and public funds policy programs) as well as the development of the public infrastructure[21], Ireland became a very attractive country to invest capital in the form of FDI.

2. The role of FDI in Ireland's economic development

For the purposes of this article, Ireland's economic growth is measured on the basis of GDP gain. GDP gain is defined as the difference between the GDP, which represents the combined worth of goods and services manufactured by all factors of production found within the borders of the country, regardless of whether they belong to national or foreign owners[22], and the GNP.

In general, Ireland's GNP and GDP vary only slightly from each other, and these changes characteristically occur rather slowly.

In 1976, the GDP level gradually began rising over that of the GNP. One can suppose that this had to do with the gradual entry of foreign capital onto the Irish market (following accession into the EEC, restrictions were put in place on barriers to trade between Member States, and a common customs levy was enforced on third parties – this is one of the sources of the so-called *tariff*

[21] The development of infrastructure in Ireland is in large part funded by the EU. From 1989 to 1993 Brussels granted Ireland 4.2 billion ECU, and then 6.9 billion between 1994 and 1999. Investment in infrastructure was co-financed by European funds, resulting in a combined value of 21 billion ECU-IDA Ireland 1998.

[22] See M. Burda, Ch. Wyplosz: Makroekonomia (*Macroeconomics*), PWE, Warsaw 1995, p. 45.

jumping investment[23], or investments from countries which earlier accessed the EU market via export).

This author also decided to verify this analysis of the economic consequences of the presence of FDI in the Irish economy econometrically.

Table 3. Nominal GDP and GNP in millions of Irish Pounds

Year	GDP	GNP
1970	1,621	1,648
1975	3,792	3,796
1980	9,361	9,003
1985	17,969	16,003
1990	27,190	24,269
1997	48,241	41,919

Source: International Financial Statistics 1998.

The assortment of variables for the equation was selected on the basis of the Solow[24] economic growth model, which distinguishes three categories of economic growth (GDP gain): growth of the labor force, accumulation of capital, and technical advancement.

According to Solow, the most accurate measure of the size of the labor force is the overall number of hours worked. Since there was no adequate source of information about the number of hours worked, the exogenic variable that represents this factor was replaced by an increase in hires, which can be understood to encompass an increase in the number of work-hours.

Capital accumulation best reflects growth in investment, including FDI. Investment plays a leading role when it comes to an analysis of the economic growth process. The current sales and net export surplus, which increases the amount of overall savings, is a good indicator of investment growth. A variable representing the net export gain in Ireland was thus introduced into the model.

A common impulse spurring advances made in technology is the constantly progressing knowledge required in the realm of product manufacturing techniques. This knowledge is contained in human capital, the

[23] See W. Molle, Ekonomika Integracji Europejskiej (*The Economics of European Integration*), PWE, Warsaw 1997, J. Witkowska, Bezposrednie inwestycje w Europie Srodkowowschodniej (*Foreign Direct Investment in Central and Eastern Europe*), WUL, Lódz 1996.

[24] See T. Tokarski, Wzrost gospodarczy (*Economic growth*), *Ekonomista* 1995, No. 5, M. Burda, Ch. Wyplosz, Makroekonomia (*Macroeconomics*), PWE, Warsaw 1995, p.177.

development of which is in large part due to education, training, and experience – areas that Ireland recognizes as extremely valuable. Besides the above-mentioned, equally important sources of valuable knowledge are trans-national corporations, which, through FDI, import capital investment and modern manufacturing technology and techniques into the country. The variable that demonstrates the technological advancement contained in foreign capital will be the FDI inflow into Ireland.

- The significance of the variables in the model:

The variable that represents employment growth proved to be the most significant. Increases in both national as well as foreign investment create corresponding increases in the number of employed in Ireland, which in turn causes production growth, which is in turn accompanied by a resulting increase in consumption (which also further stimulates production growth).

Another meaningful variable was FDI inflow combined with a high rate of export growth. The majority of investment in Ireland is directed at export production. Within a short period of time, this phenomenon was partially responsible for the Irish balance of payment surplus as well as growth in savings, with which more investments could be made and employment and production could increase.

The least significant variable, though also important, turned out to be labor productivity. It can thus be presumed that according to Solow, labor productivity, one of the factors of economic growth, plays a smaller role in Ireland's economic development than the previously mentioned ones. While in fact productivity continues to grow as a result of a high level of education and technological advancement, a more significant factor in Ireland's development, however, is the accumulation of capital.

- **Delays:**

Economic growth has a very delayed reaction to changes in other macroeconomic factors, a fact which also proved true in the case of Ireland.

GDP gain has the most delayed reaction to changes in export gain, and then reacts with the same delay to FDI inflow and changes in labor productivity.

- **Reaction strength:**

Economic growth most strongly reacts to FDI inflow, which would confirm the hypothesis presented earlier in this paper that FDI has had a strong impact on economic development in Ireland. High elasticity (0.42%) could be a result of the fact that FDI combines all three of Solow's elements of economic growth: technical advancement, labor resources, and the accumulation of capital. The very definition of FDI states that it is a transfer not only of capital resources,

but also of material and human resources, in other words of knowledge[25]. FDI improves the balance of payment status, which increases savings; savings in turn increase investment, which is a source of new positions on the labor market. The foreign sector in Ireland is responsible for half of all employment and production in Ireland[26].

Economic growth is also closely tied to net export gain. As can be seen from earlier considerations, foreign companies, either cooperating with local enterprises or acting independently as manufacturers of products meant for foreign markets, are the principal motivators of export growth.

3. Factors that attract FDI to Ireland

As a result of conducting empirical verification of the hypotheses presented at the beginning of this article, it became evident that foreign capital plays a particular role in Ireland's economic development. Each year, an increase in foreign capital inflow can be observed in Ireland in the form of FDI. The IDA plays a significant role in this phenomenon, as its aim is to attract investments, especially those that have a positive effect on export growth, import modern technology, and create new positions on the labor market utilizing local raw materials. This strategy favored (and continues to favor) highly technological industries, which utilize a highly skilled work force and are mainly investing in computer programming, pharmaceutical, and biotechnological production[27].

Up until the 1960s, Ireland was a protectionist nation and it strongly forbade the presence of foreign capital in Irish enterprise. Since 1966 however, and especially as a result of Ireland's accession into the EU, these regulations have been lifted. The government then realized that economic development couldn't be supported by European funds alone. This far-reaching strategy emphasized attracting foreign investment in modern market branches with the highest export potential. Gains were not taxed; only later were they subject to a lump-sum tax of 10%. Customs duties were lifted and various attractive means of supporting investment were instituted. These mainly entailed subsidies for employment and the improvement of worker skills, rental subsidies, and technological transfer support. While tax allowances are available to all

[25] See W. Molle, Ekonomika integracji europejskiej (*The Economics of European Integration*), PWE, Warsaw 1997, p. 36.

[26] IDA annual report 1998.

[27] www.idairleand.com

enterprises, foreign as well as those with mixed or purely national capital, other benefit packets were negotiated with IDA and granted to particular investors on an individual basis. When, for example, a benefit packet exceeds 2.5 million Irish Pounds[28], the state must authorize its distribution. The standard tax on business income in Ireland (10% until 2005) is applied to all enterprises in certain zones (Shannon), which, according to the European Commission causes an unfair imbalance in competition[29].

Table 4. Key Sectors of foreign direct investment and the most significant investors

Information Technology	**Pharmaceuticals**	**International financial and computer services**
35,000 employed, 300 enterprises, export: 13 billion Irish Pounds	19,000 employed, 200 enterprises, export: 7 billion Irish Pounds	
• Apple Computer • 3Com • Compaq • Dell • Eastman Kodak • Ericsson • Gateway 2000-06-21 General Electric • Hewlett-Packard • Hitachi • IBM • Intel • Motorola • NEC • Nortel • Fujitsu • Sun Microsystems	• Bristol- Myers Squibb • Elan • Eli Lilly • Merck • Johnson&Johnson • Leo Laboratories • Pfizer • Pharmacia&Upjohn • Roche • Schering-Plough • SmithKline Beecham • Yamanouchi • Abbott • Bausch&Lomb • Baxter • Boston Scientific • CR Bard • American Home Products	• AGF • American Airlines • AOL Bertelsmann • Apple • Bankers Trust • Bear Stearns • Chase Manhattan • Citibank • Compaq • DEC • Ericsson • Credito Italiano • Hitachi • IBM • KAO Infosystems • Lotus • Merrill Lynch • Microsoft • Motorola • Oracle • Gateway 2000 • Philips • Sun Microsystems • UPS • Whirlpool

Source: Welcome to IDA Ireland, IDA 1999.

[28] Over 2 billion USD, exchange rate according to EUROSTAT, Luxembourg: www.dsidata.com/cgi/local/pocket.pl

[29] F.Ruane, G. Holger; *The Impact of FDI on Sectoral Adjustment in the Irish Economy,* National Institute Economic Review, No. 2/1997, p. 85.

From the studies conducted among American investors by IDA between 1995 and 1997, it can be concluded that their main motivation for engaging in FDI in Ireland was the fact that they could evade customs barriers placed upon entry of their goods into the European Union market[30]. Furthermore, production in Ireland is well worth it when one examines the advantageous conditions the location offers, such as low tax rates or access to a cheap and skilled labor force (compare Table 5).

Table 5. Cost of labor per hour in USD per person employed in industry

Ireland	13,57
Great Britain	15,47
France	17,97
Germany	28,28
Holland	20,61
Spain	12,16
USA	18,24
Japan	19,37

Source: US Department of Labor, 1998.

Just as in other regions, so to the reform of educational and training systems began quite late in Ireland. As a result of an increase in the unemployment rate in the 1960s, and of studies conducted that showed a strong correlation between unemployment and the level of training and qualification, the educational system began to be reformed. Tuition was lifted from secondary and higher learning institutions. The support and expansion of these higher level learning institutions resulted in an increase in graduates with a better overall education. Increased investment in education and qualification systems brought with it immediate benefits. Nearly half of the population entering the professional world can boast a high level of education that entails emphasis on new technology. This can be very positive stimulus for foreign investors to engage their capital in this location.

From the very start, Ireland realized that foreign concerns would not choose the island as the object of their capital expansion program unless they were sure that their investments would be safe there. This could only be ensured by the presence of a stable political and social situation, a well-developed (and expansive) infrastructure, qualified and skilled personnel, as well as investment preferences and concessions for foreign investors.

[30] IDA 1998.

Table 6. Foreign investment structure in Ireland, by country of origin. From 1986 to 1997, in millions of Irish Pounds

Year/Country	USA	EU	UK
1986	80	84	50
1987	77	112	58
1988	86	68	21
1989	83	37	18
1990	65	42	16
1991	113	56	13
1992	135	60	16
1993	192	32	17
1994	153	41	26
1995	184	21	12
1996	300	46	27
1997	323	45	25

Source: www.idairleand.com

To conclude: the following factors helped bring about a high level of FDI inflow into Ireland:

- State pro-investment policy (taxes);
- Expansion of the Irish infrastructure;
- Wage policy (low labor costs which increased the Irish economy's competitiveness);
- Educational and academic systems (youth education policies, re-qualification courses).

The majority of FDI activity in Ireland comes from USA enterprises. American capital in Ireland is several times larger than investments from Great Britain or from the European Union.

4. Theoretical determinants of FDI in Ireland

The various theoretical analyses concerning FDI that have evolved over the years all attempt to answer the following questions: What conditions must be present in order for FDI to exist? Why and how are foreign investors able to compete with local enterprises? Why is a given country chosen as appropriate for the investment of capital? None of the FDI theories that have been

formulated to this day are without certain weaknesses and limitations[31]. The collective development of these theories has resulted in the formulation of Dunning's eclectic theory of foreign direct investment (known as the eclectic OLI paradigm: oversight, location, internalization), which allows for the greatest number of various possible interpretations of the FDI phenomenon. This theory combines the conclusions resulting from three different trends of FDI theory: oversight (oligopolistic advantages), location, and internalization.

According to the OLI paradigm, FDI can exist when the following three conditions are met simultaneously:

I. An enterprise must possess certain property right privileges[32] in order for it to be able to compete with local enterprises when taking up production in their country.

In the case of FDI in Ireland, this condition has been fulfilled. Irish enterprises are not capable of competing with large trans-national corporations originating in highly developed countries that possess property ownership privileges in all areas.

II. It must be more advantageous for an enterprise to transfer their property rights across borders within their own organization (internalization) than to sell or lease them to foreign enterprises (externalization). Arguments for and against the internalization of enterprises in the world economy can be found in Table 7.

III. Such factors must exist that make locating production in a given host country more attractive than doing so in the country of origin or in any other country for the investment of capital in the form of FDI[33].

These factors include:

- Market size and prospects
- Cost of labor
- Availability of natural resources
- Innovation and new technology

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[31] Zob. m.in. Z. Geldner, Przyczynek do teorii bezpośrednich inwestycji zagranicznych (*Contributions to Foreign Direct Investment Theories)*, PWE, Warszawa 1988, J. Witkowska, Bezpośrednie inwestycje zagraniczne w Europie Środkowowschodniej (*Foreign Direct Investment in Central and Eastern Europe)*, WUŁ, Łódź 1996.

[32] Op. cit.

[33] See, among others, J.H Dunning, Trade, location of economic activity and the multinational enterprise: some empirical effects, Journal of International Business Studies, No. 11, 1979, Explaining the International Direct Investment Position of Countries: Towards a Dynamic or Development Approach, Weltwirtschaftliches Archiv, 1981, Band 117, Heft 1.

Table 7: Effects of internalization

Advantages:	Disadvantages:
• Greater flexibility of reaction to changes on foreign markets (as compared to export or contractual cooperation), since the internalized enterprise is more familiar with the market's existing conditions and can extrapolate future situations, • Possibility of avoiding costs tied with the formulation and negotiation of contracts (transaction costs), • Possibility of avoiding the risk of the uncontrolled spread of their technical knowledge (this risk is high in the case of sale of license or the signing of a franchising agreement. Furthermore, under contractual cooperation arrangements the danger may arise that the licensee manufactures lower-quality or even defective products, which could weaken the enterprise's image), • The purchaser will avoid uncertainty as to the essence and quality of the item he is buying (especially if that item is knowledge), • Better security of property rights, • Possibility of extending the life cycle of products or technology (independent production in a foreign country most often takes place during a later stage of the product life cycle – the mature product stage), • Possibility of the most efficient utilization of the effects of scale (the manufacturer is able to expand production beyond the country of origin while lowering overall costs of operation, as well as protecting himself from possible losses resulting from a decrease in demand on the national market. The lowering of overall costs of enterprises engaged in FDI could be a result of the fact that the host country offers cheaper raw materials or lower costs of labor (an example might be the global textile production industry, which is currently concentrated in China, India and Pakistan as well as in other countries with low costs of labor). As a result of lower costs in the country where the investment is made,	✓ Lack of adequate incentive for effective individual operation in the relationship between the mother enterprise and the operation and branch managers (this requires additional expenses tied with monitoring the effectiveness of management in company operation and branches, as well as developing a compensation system to award the personnel hired there), ✓ Fragmentation of the indirect product market, e.g. breaking it up into many small markets, which could lower efficacy, ✓ The creation of additional costs tied to the necessity of managing a highly varied operation within the internalized market (this requires of the manager possession of highly specialized knowledge in various areas, or of the possibility of calling upon experts – which also requires expansive general knowledge enabling a correct and accurate evaluation of the choice of the expertise offered to the enterprise. To the above mentioned difficulties regarding management, we can add communication barriers and sociological, cultural, linguistic and geographical conditioning).

it sometimes happens that an enterprise begins exporting their products back to the country of origin, or even gives up national production altogether. It must be noted that the target country might offer foreign investors not only cheaper foreign materials, but also better access to them, • Possibility of avoiding problems connected with restrictive import policies in the host country (which are so burdensome in the case of export), as well as limiting currency risk (under the condition that the enterprise is not forced to procure items from other countries, such as raw and other materials for production).	

Source: Author's own work based on (among others): Z. Geldner, Przyczynek do teorii bezposrednich inwestycji zagranicznych (*Contributions to Foreign direct investment Theory*), PWE, Warsaw 1988, J. H Dunning, Trade, location of economic activity and the multinational enterprise: some empirical effects, Journal of International Business Studies, No. 11, 1979, J. Witkowska, BIZ w Europie Srodkowowschodniej (*FDI in Central and Eastern Europe*), WUL, Lódz 1996.

- Political stability and the degree of investment risk in a given country
- Governmental policies regarding foreign investors,
- Tariff barriers, the level of trade freedom between the investor's country of origin and the host country,
- Geographical location and the resulting transport costs (proximity of major export markets),
- Technical and economical infrastructure,
- Cultural differences (mental and linguistic differences.

This author verified this analysis of the determining factors of FDI in the Irish economy on the basis of the third OLI condition econometrically [34].

Not all factors are quantifiable, however, such as for example cultural differences or amounts of natural resources, and it is thus impossible to verify these factors econometrically as variables in the FDI function in Ireland. In the case of the remaining factors, the author instituted far-reaching simplifications. For example, the market's size and its prospects for growth were equated with (for the purposes of this study, of course) an increase in employment and economic innovation in Ireland, and the development of new technology was

[34] See Annex 2.

equated with labor productivity. A gains index on invested capital gains index was instituted to reflect the geographical location and the resulting transport costs, as well as the state and development of the infrastructure.

- The significance of the variables in the model:

The most significant variable turned out to be the variable representing an increase in employment. Growth in national as well as foreign investment has generated an increase in employment in Ireland. This situation is evidence of positive economic development in this country, and this creates incentive for foreign investors to invest in the form of FDI. It should also be noted that the presence of foreign investment attracts other investors (as has been mentioned earlier in this article).

A slightly less important variable, though also significant, was the one that represented gain on capital investment. Enterprises aim to operate in such a way as to maximize their profits. This is why enterprises choose to operate in such locations where profits are greater in relation to the capital invested in economic activity[35]. It should therefore be expected that if the capital investment gain index in Ireland increases, the amount of FDI inflow into Ireland would also increase.

The next explanatory variable in order of significance is labor cost. The author interprets the lesser significance of this variable relative to the previously mentioned ones by the fact that foreign investment in Ireland is usually engaged in highly technological industry, which does not necessarily require much actual work[36]. The lesser significance assigned to labor productivity is also a result of the fact that production efficacy in an industry that utilizes modern manufacturing techniques depends in large part on the machines and devices used, and to a lesser extent on human labor.

- Delayed Reaction:

This model confirmed the long-term character of the decisions made regarding direct foreign investment. The variables taken into account affected the target determinant with delays that varied from one year up to four. This would confirm the results of the study conducted in the 1980s on the five most highly developed countries (France, Germany, Italy, Great Britain and Belgium), which showed that the reaction of the investors engaged in FDI to GDP variation is displaced in time by at least two years[37].

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[35] See: J. Czekaj, Z. Dresler, op. cit., p. 146.

[36] An increase in hires can be seen in national enterprises, which cooperate with enterprises that hold foreign capital; this signifies that the main source of new work positions are foreign investors.

[37] See: J. Witkowska, op. cit.

- Reaction strength:

The greatest elasticity in the influx of FDI is conditionally dependent on capital gain. One can guess that such large elasticity can result from the fact that foreign enterprises, considering their economic potential in relation to local companies, concentrate on maximizing their profits and minimizing the costs of production. In Ireland, the concept of "survival on the market" is a marginal consideration and therefore no additional costs are required to face up to the local competition, as is the case when investing in highly developed countries with high market saturation. Thus foreign investors do not bear costs related to, for example, advertisement campaigns in the initial stages of the company's entry onto the market; this allows them to ultimately concentrate on generating profits on the capital they invested.

5. Conclusions

FDI in Ireland is seen as one of the prime motivating factors of the country's economic growth. It is in the highest demand in economically weak regions, which have unfavorable economical indices such as high unemployment rates, underdeveloped or deteriorating industries, or regions with weak technical and economical infrastructure.

In the present age of globalization, with its attendant freedom of movement of goods and above all capital and persons, regional polarization will increase, as Kindleberger and Holland have pointed out[38]. They specifically mention the weakening of various types of regional incentives in the event that an enterprise makes its profits as a result of secured property rights or the advantages of internalization. When choosing a location for their new branches, such an enterprise's strategic move is to locate them in financially strong central regions, in developed or rapidlly developing countries. In this way, the effects of the localization of foreign investments can be increased, since a large investment attracts competition as well as cooperative companies to the location (the copy-cat effect).

Thus, on the one hand, FDI influx into developed countries/regions deepens regional polarization in the EU. On the other hand, however, FDI influx into countries with delayed development helps accelerate their economic growth

[38] Por. S. Holland, *Capital Versus the Regions,* The Macmillan Press Ltd., London and Basingstoke, 1976, p. 43-56.

(together with assistance from the EU), which undoubtedly leads to the leveling of differences in regional development in the EU.

It should also be mentioned here, citing S. Holland, that foreign capital invested in highly developed regions that are already densely saturated with foreign capital has a much smaller effect on the region's growth than capital invested in a less economically developed region[39]. Thus we can presume that in the long run, it will be possible to equalize the differences in growth in the various regions of the EU.

It can be concluded from the analysis conducted that FDI has had a significant effect on Ireland's economic development. We can presume that as a less developed region of the EU, it has a good opportunity to catch up to the more developed ones.

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[39] Ibid.

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ANNEX 1

Estimation results: Packet G

```
r gdp1-gdp1[1]= !b+b[1]+b[2]+b[3], zat_i, e+e[1]+e[2]+e[3]+e[4]+e[5],
labprod_i-labprod_i[4]

:

SEE   =     370.11 RSQ   = 0.8637 RHO =   0.01 Obser  =   20 from 1978.000
SEE+1 =     370.13 RBSQ  = 0.8382 DW  =   1.98 DoFree =   16 to   1997.000
MAPE  =      71.51
   Variable name          Reg-Coef   Mexval  t-value  Elas   NorRes  Mean
0 gdp1-gdp1[1]          - - - - - - - - - - - - - - - - - -          1281.75
1 b+b[1]+b[2]+b[3]        35.28973   39.0    3.861    0.42    3.98   15.23
2 zat_i                  270.98323   59.0    4.946    0.26    2.76    1.22
3 e+e[1]+e[2]+e[3]+e[4]+e[5] 26.43127   36.3    3.707    0.31    1.52   15.11
4 labprod_i-labprod_i[4]   100.16247   23.4    2.892   -0.01    1.00   -0.10
```

The estimated function of GDP gain in Ireland between 1978 and 1997 is represented by the following:

$$\widehat{gdp_t - gdp1_{t-1}} =$$

$$+35.289(b + b_{t-1} + b_{t-2} + b_{t-3} + b_{t-4})$$

$$t(b1) = 3{,}861$$

$$+270.98323(zat\_i)$$

$$t(b2) = 4{,}946$$

$$+26.431(e_t + e_{t-1} + e_{t-2} + e_{t-3} + e_{t-4} + e_{t-5})$$

$$t(b3) = 3{,}707$$

$$+100.162(labprod\_i - labprod\_i_{t-4})$$

$$t(b3) = 2{,}892$$

Where:

Endogenic variable:

- $gdp1\text{-}gdp1_{t-1}$ – GDP gain in Ireland in millions of Irish Pounds in 1990 prices.

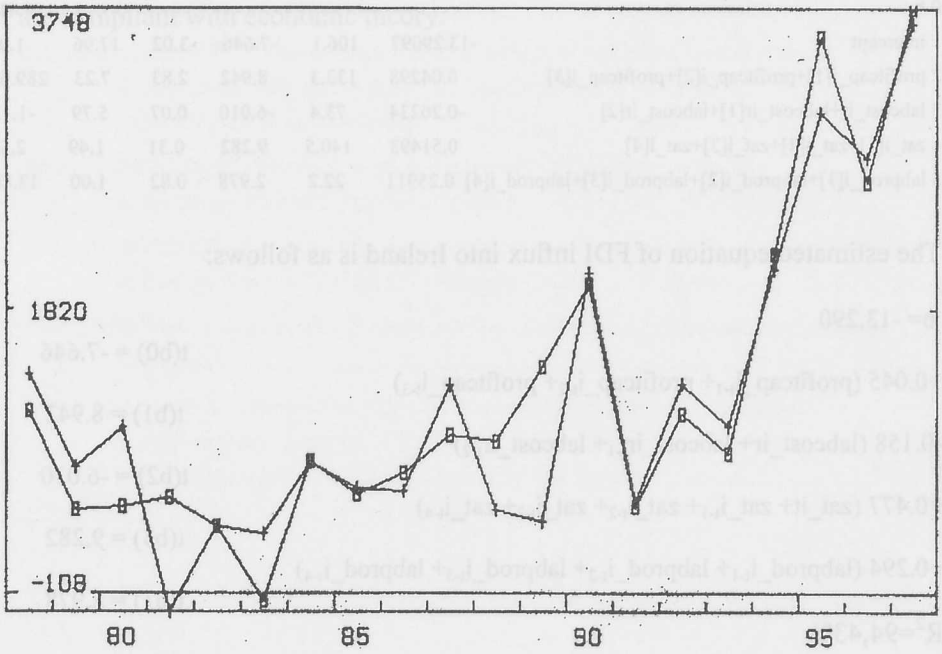
Exogenic variables:

- $b_t + b_{t-1} + b_{t-2} + b_{t-3}$ - foreign capital influx in the form of FDI (real value) during the current year, as well as with delays of one, two and three years.
- zat_i - employment increase during the current year, represented in percentages.

- $e_t + e_{t-1} + e_{t-2} + e_{t-3} + e_{t-4} + e_{t-5}$ - net export gain in % with delays of one, two, three, four and five years.
- labprod_i-labprod_i_{t-4} - labor productivity, variations in growth with delays of up to four years.

The estimated parameters express the effects of unit changes in the explanatory variables on the sought-after variable being assessed. All symbols are compliant with economic theory.

Diagram 1: Diagram representing adapted function of GDP growth in Ireland between 1978 and 1997



Source: Author's own work based on Packet G.

ANNEX 2

Estimation results: Packet G

```
r b=profitcap_i[1]+profitcap_i[2]+profitcap_i[3],labcost_ir+
+labcost_ir[1]+labcost_ir[2],

zat_i[1]+zat_i[2]+zat_i[3]+zat_i[4],

labprod_i[1]+labprod_i[2]+labprod_i[3]+labprod_i[4]
:
  SEE   =     0.97 RSQ   = 0.9443 RHO =   0.10 Obser  =   23 from 1975.000
  SEE+1 =     0.97 RBSQ  = 0.9319 DW  =   1.80 DoFree =   18 to   1997.000
  MAPE  =    51.18
```

Variable name	Reg-Coef	Mexval	t-value	Elas	NorRes	Mean
0 b	-------	----------				4.41
1 intercept	-13.29097	106.1	-7.646	-3.02	17.96	1.00
2 profitcap_i[1]+profitcap_i[2]+profitcap_i[3]	0.04298	133.3	8.942	2.83	7.23	289.66
3 labcost_ir+labcost_ir[1]+labcost_ir[2]	-0.26234	73.4	-6.010	0.07	5.79	-1.12
4 zat_i[1]+zat_i[2]+zat_i[3]+zat_i[4]	0.51493	140.5	9.282	0.31	1.49	2.65
5 labprod_i[1]+labprod_i[2]+labprod_i[3]+labprod_i[4]	0.25911	22.2	2.978	0.82	1.00	13.86

The estimated equation of FDI influx into Ireland is as follows:

$\hat{b}$= -13.290

t(b0) = -7.646

+0.045 (profitcap_i_{t-1}+ profitcap_i_{t-2}+ profitcap_i_{t-3})

t(b1) = 8.942

-0.158 (labcost_ir+ labcost_ir$_{t-1}$+ labcost_ir$_{t-2}$)

t(b2) = -6.010

+0.477 (zat_it+ zat_i_{t-1}+ zat_i_{t-2}+ zat_i_{t-3}+ zat_i_{t-4})

t(b3) = 9.282

+0.294 (labprod_i_{t-1}+ labprod_i_{t-2}+ labprod_i_{t-3}+ labprod_i_{t-4})

t(b1) = 2.978

R^2=94,43%

DW= 1.80

Su=0.97

Where:

Exogenic variable:

- b – inflow of foreign direct investment into Ireland.

Endogenic variables:

- profitcap_i_{t-1}+ profitcap_i_{t-2}+ profitcap_i_{t-3} - capital profitability with delays of one, two and three years.
- labcost_ir+ labcost_ir_{t-1}+ labcost_ir_{t-2} - real cost of labor during the current year as well as with delays of one and two years.
- zat_it+ zat_i_{t-1}+ zat_i_{t-2}+ zat_i_{t-3}+ zat_i_{t-4} - increase in employment during the current year as well as with delays of one, two, three and four years.
- labprod_i_{t-1}+ labprod_i_{t-2}+ labprod_i_{t-3}+ labprod_i_{t-4} - labor productivity with delays of one, two, three and four years.

The estimated parameters express the effects of unit changes in the explanatory variables on the sought-after variable being assessed. All symbols are compliant with economic theory.