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Influence of real exchange rate on
the Polish trade balance

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CONTENTS

Abstract

This thesis examines the impact of the changes in the real exchange rate on shaping foreign trade in Poland in the long lasting transformation period, between the years of 1993 and 2007. The main focus of the analysis is on the relationship between PLN real depreciation, and an increase of Polish exports and a decrease of Polish imports, which is potentially connected with the effect known as the J-curve.

The thesis is divided into three parts, as follows:
The first one describes the main changes of the macroeconomic factors in the Polish economy. These changes had a significant impact on the development of Poland's economic stabilization and determined the direction of economic changes. On the basis of the macroeconomic stabilisation pentagram, changes in the growth rate of the real GDP, unemployment rate, inflation rate, government spending rate and the current account balance to the GDP, which took place in the transformation period, are shown.

The second part presents some factors and processes taking place in the transformation period, which had a large influence on determining the dynamics and development of Polish foreign trade. The process of trade liberalization was triggered by international economic cooperation, which turned out to be very important from the economic point of view. This began when Poland joined various international organizations and alliances, and allowed for the gradual removal of barriers and trade limitations, leading to a significant acceleration of the development for the young economy. Poland received a lot of support from external sources, but it also had to comply with obligations arising from these treaties. Poland's entry into the European Union marks the point in time of a complete opening of the Polish economy and of trade liberalization.
Intensive direct foreign investments, attracted by the rapidly developing Polish economy, were also very important for the country, as they accelerated the dynamics of Polish exports and imports (especially FDI had great impact on Polish import).
There were changes in foreign trade, which took place in the transformation period and implied a general shift in the geographical structure towards European Union countries. The main goal was to increase the competitive position of Polish trade on the international market, which is connected to the low level of technological innovativeness in Poland.

The paper also summarizes the history of the PLN transformation and of the concomitant monetary policy in a period of a few years. During that time the PLN developed from an inflexible currency to a freely floating one, and was finally integrated into the international currency market. The whole process had the important goal of limiting high inflation in Poland.

Part three of the paper investigates the relationship between changes in the real exchange rate of PLN and Poland's trade balance with the European Union in the years of 1993-2007. Here, the Marshall-Lerner condition is described, which is connected to the impact of real depreciation on export and import. It is followed by theoretical aspects of the J-curve and selective studies on this effect, carried out in various countries by a number of economists. The analysis is preceded by a brief description of methodology and of the data. A theory of real exchange rate and modifications regarding REER used in the analysis are described in more detail.

A full analysis involves the evaluation of the correlation analysis in SPSS 16.0 and Gretl 1.8.4 software, which is also included. This is followed by a description of the course of fluctuation of currency in Poland, and real depreciation periods are observed. Following that is the analysis of the dynamics of increase in export and import between Poland and the European Union, as well as trends in trade balance. The paper closes with overall findings and conclusions.

Abstract (Deutsch)

Die vorliegende Arbeit behandelt die Entwicklung des realen Wechselkurses Polens in der Transformationszeit, zwischen 1993 und 2007, und die Wechselwirkungen mit dem Außenhandel Polens. Die Hauptanalyse beschäftigt sich mit der möglichen Korrelation der PLN-Währungsabwertung und der positiven Entwicklung der polnischen Außenhandelsbilanz, welche wahrscheinlich mit dem ökonomischen Konzept der J-Kurve in Einklang zu bringen ist.

Die Arbeit zerfällt in 3 separate Teile:

Der erste Teil beschreibt die Veränderungen, die einen signifikanten Einfluss auf Polens Wirtschaftsstabilisierung im makroökonomischen Umfeld hatten. Auf der Basis des makroökonomischen Stabilisierungs-Pentagramms werden Veränderungen in der Transformationszeit im Wachstum des BIP, der Arbeitslosenrate, der Inflationsrate, der Staatsausgaben, und im Verhältnis der Leistungsbilanz zum BIP gezeigt.

Der zweite Teil behandelt einige Faktoren und Prozesse in der Transformationszeit, die einen ausschlaggebenden Einfluss auf die Entwicklungsdynamik des polnischen Außenhandels hatten. Der Prozess der Handelsliberalisierung wurde durch internationale Wirtschaftskooperationen ausgelöst, was aus der wirtschaftlichen Perspektive sehr wichtig war. Dies wurde durch Beitritte Polens zu verschiedenen internationalen Organisationen und Allianzen erreicht. Dadurch wurde ein sukzessiver Abbau an Barrieren und Handelseinschränkungen, sowie eine signifikante Entwicklungsbeschleunigung der jungen Wirtschaft erreicht. Polen erhielt viel Unterstützung durch das Ausland, aber es hatte durch diese Verträge auch sehr viele Auflagen zu erfüllen. Ab dem EU-Beitritt Polens kann man von einer völligen Öffnung des Markts sowie der Handelsliberalisierung sprechen.
Eine wichtige Bedeutung für die polnische Ökonomie hatten auch intensive direkte Auslandsinvestitionen, die durch eine sich schnell entwickelnde Wirtschaft angezogen wurden. Dank ihnen beschleunigte sich die Dynamik sowohl des polnischen Exports als auch des Imports, wobei die ausländischen Direktinvestitionen besonders großen Einfluss auf den polnischen Import hatten.
Während der Transformationszeit gab es Veränderungen im Außenhandel, die vor allem die Verschiebungen in der geographischen Struktur in die Richtung der

europäischen Länder betrafen. Der Schwerpunkt wurde dabei auf die Wettbewerbsfähigkeit des polnischen Handels auf dem internationalen Markt gelegt, womit auch das Problem der niedrigen technologischen Innovation in Polen zusammenhängt.

Die Arbeit behandelt auch die Geschichte der Umstellung der PLZ-Währung auf die PLN-Währung. Während weniger Jahre verfolgen wir die Umstellung von einer unflexiblen Währung bis zu ihrer vollen Flexibilisierung und zur Einführung auf den internationalen Währungsmarkt. Dieser Prozess hatte ein wichtiges Ziel, nämlich die Einschränkung der hohen Inflationsrate in Polen.

Den dritten Teil der Arbeit bildet vor allem eine empirische Analyse, die versucht, die aufgestellte These in Bezug auf den Einfluss der Veränderungen der realen Zloty-Wechselkurs auf die Gestaltung der Handelsbilanz zwischen Polen und der Europäischen Union in den Jahren 1993-2007 zu bestätigen. Hier wird die Marshall-Lerner-Bedingung besprochen, die mit dem Einfluss der Abwertung auf den Export und Import zusammenhängt. An dieser Stelle folgen auch eine Erläuterung der Theorie der J-Kurve sowie ein Überblick über ausgewählte Forschungsarbeiten, die dieses Phänomen in verschiedenen Ländern untersucht haben. Vor der empirischen Analyse wird die Methodologie sowie die Quelle der angewendeten Daten besprochen. Im Detail wird die Theorie des realen Wechselkurses der Währung behandelt, sowie die in der Analyse angewendeten Modifikationen in Bezug auf REER.

Die zentrale Analyse stellt die Besprechung der im SPSS 16.0 und Gretl 1.8.4. durchgeführten Korrelationsanalyse dar. Dabei werden die zyklischen Bewegungen des realen Wechselkurses der polnischen Währung sowie damit verbundene Entwertungsperioden verfolgt. Auch die Dynamik des Wachstums des Exports und Imports zwischen Polen und der Europäischen Union sowie Trends in der Handelsbilanz werden analysiert.

Schlussfolgerungen, die aus der oben genannten Analyse zu ziehen sind, beenden die vorliegende Arbeit.

Introduction

Since 1989, there has been an observable economic transformation in Poland, which has changed from a closed economy that is managed from the top down, into an economy that is fully open to foreign markets. Taking government decisions and the development of foreign trade in Poland since 1990 into account, this period can be divided into five parts:

I.   The liberalisation of foreign trade prices, PLN devaluation, exchangeability of PLN at home market, cancellation of the foreign-currency limits in import payments.

II. Higher import tariffs, negotiations about joining CEFTA and the EU.

III. The period of 1994-2004: deceleration of the process of PLN devaluation, privatisation processes, and preparation for EU membership.

IV. From May 2004 to present: Poland as a member of the EU, with a variety of results, such as: common import and export tariffs for all EU countries in trade with non-EU members, foreign trade policy moved partially to an international level.[1]

 V. From December 2007 to present: Poland joined the Schengen zone (possibility to cross EU borders without document checks); lower transport prices, restrictions in visa policies for eastern European countries.

Due to these processes, Poland seems to be a perfect example for the observation and analysis of economic phenomena under great structural changes.

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[1] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

1. Analysis of macroeconomic components in Poland during the economy's transition from 1990 to 2007

To analyse the macroeconomic components in Poland from 1990 to 2007 (selected years) the method of the *macroeconomic stabilisation pentagram* (PSM) can be applied (Figure 1). This technique was developed by A. W. Phillips and R. A. Mundell, and then disseminated in Poland by The Business Condition and Prices of Foreign Trade Institute in Warsaw (G. Kołodko). The PSM diagram can be helpful to illustrate and analyse macroeconomic development in Poland in different periods.

Five variables are assumed to be the best description of a country's economic situation: growth rate of real GDP (ΔGDP), unemployment rate (U), inflation rate (CPI), government spending rate (G) and the current account balance to the GDP (CA).[2]

Figure 1. Macroeconomic stabilisation pentagram
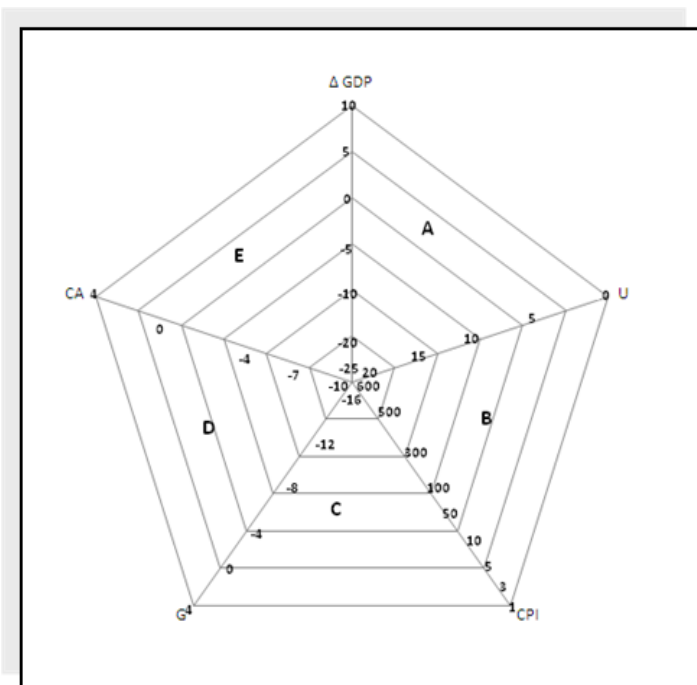
Source: Kołodko, G. (1993) "Kwadratura pięciokąta. Od załamania gospodarczego do trwałego wzrostu", Poltext

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[2] Kołodko, G. (1993) "Kwadratura pięciokąta. Od załamania gospodarczego do trwałego wzrostu", Poltext

How to create the pentagram using these indexes will now be described in detail. Elements given above the generate pentagram surface as a single unit. The optimal (but only theoretical) situation for any country can be calculated using this model of the full surface of the pentagram.

This is defined by the following formula[3]:

PSM= [(ΔGDP×U) + (U×CPI) + (CPI×G) + (G×CA) + (CA×ΔGDP)] × K

K = ½ sin72°, a constant coefficient (0.475)

In practice, the idea of the magic pentagram is that a larger PSM coefficient (surface of the pentagram) corresponds with a better economic situation, while a smaller PSM coefficient indicates a worse economic development in a given country.

If partial indexes are used, PSM can also be shown as a sum of five triangles: A (real sphere, growth and unemployment rate), B (stagnation, unemployment and inflation growth rate), C (budget and inflation), D (financial balance) and E (external sector).[4]

A = (ΔGDP x U) x K

B = (U x CPI) x K

C = (CPI x G) x K

D = (G x CA) x K

E = (CA x ΔGDP) x K

The whole mechanism works based on the correlation between partial elements. For example, if inflation or unemployment increases, stagnation also increases in the country. To analyse the Polish situation from 1990 to 2007, only selected data from 1990, 1996, 2001 and 2007 will be used (Figure 2).

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[3] Kołodko, G. (1993) "Kwadratura pięciokąta. Od załamania gospodarczego do trwałego wzrostu", Poltext
[4] Ibid.

Figure 2. Macroeconomic stabilisation pentagrams – selected years
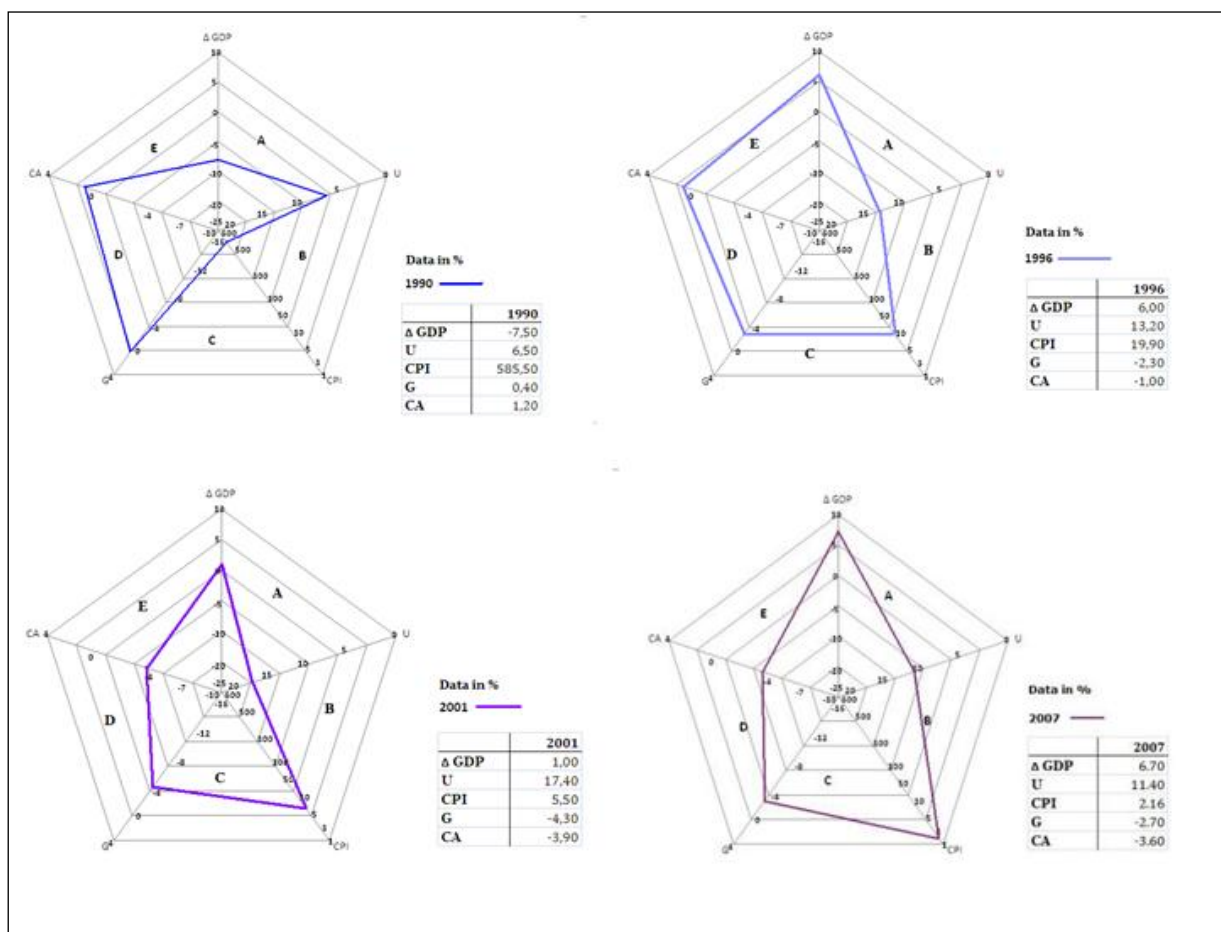
Source: Own work.

The first years of the economic transition were characterized by a fracture in the country's situation and a drop in economic growth. This was caused by changes on the market and restrictive stabilization policies, with simultaneous insufficient reforms (L. Balcerowicz).

A strong decrease in GDP (ca. 14%) occurred between 1990 and 1991. In 1992, an improvement of the situation and a positive GDP growth is observed. This was when the process of privatization began, and the economy began to attract the capital of foreign investors. Then a clear strong growth of the GDP (1995: 7%) occurred in the years of 1994-1997 (Figure 3). This growth was highest among the countries undergoing transformation at the time, but it was also higher than the dynamics of

economic growth of the EU countries. The economic boom was the result of many reforms in the country; investment, internal demand and exports also increased.[5]

The decrease of dynamic of the GDP growth rate in Poland can be observed beginning in 1998, although GDP was comparatively high (ca. 4%). There was already a distinct fall of dynamic of the GDP growth rate to ca. 1% in 2001-2002, due to the decrease of the credits capital expenditure and a high interest rate on credits (Figure 3). Internal demand and the inflow of foreign capitals also decreased during that time.

The year 2004 was pivotal for the Polish economy and for its transition process. It was in 2004 that Poland joined the European Union, which undeniably caused a higher GDP growth in the following years (growth from 5.5% to 6.7% in the period of 2004-2007). Here, a considerable factor was export growth and changes of its structure, along with the inflow of foreign capital.[6]

Figure 3. GDP in Poland
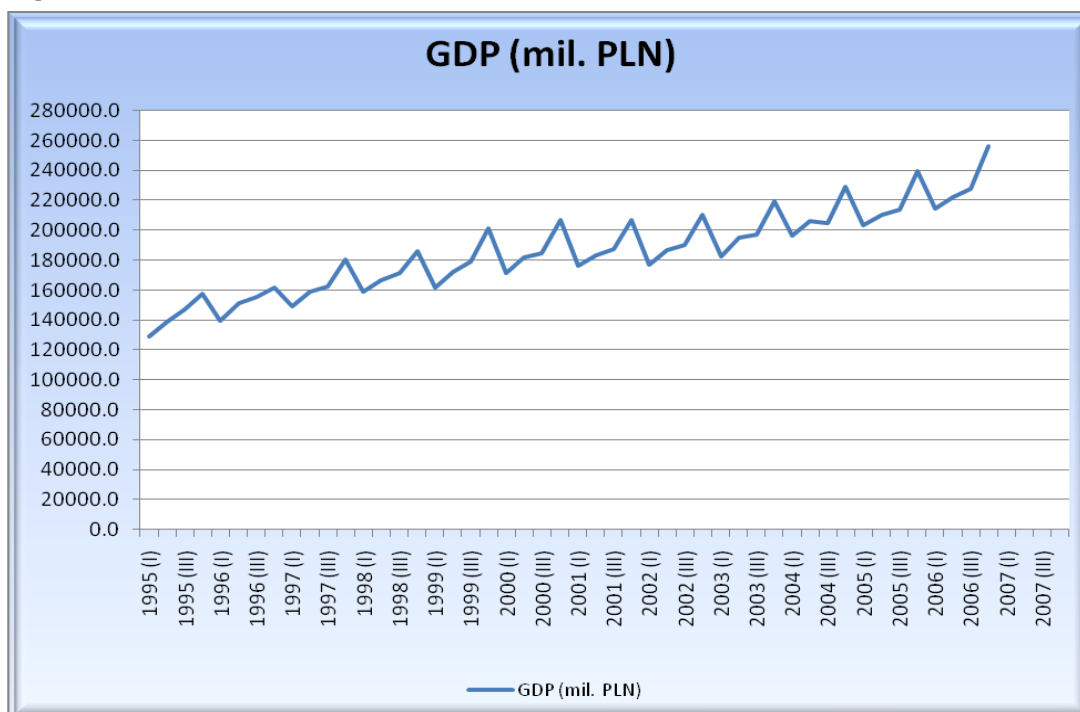
Source: *Based on GUS (Central Statistical Office of Poland) data.*

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[5] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

[6] Ibid.

With the transformation and the opening of the economy, the problem of unemployment arose in Poland (Figure 4). The largest decline in employment was at the beginning of the 1990s (1993: unemployment rate of 16.4%). Here, the principal factors were the economic recession, the import tariffs policy and the exemption of import tariffs barriers on a considerable quantity of goods, along with the opening of the labor market. Economic growth and changes in unemployment benefits in the following years succeeded in lowering the unemployment rate to 10.3% in 1997.[7]

Figure 4. Unemployment rate in Poland in 1990-2008
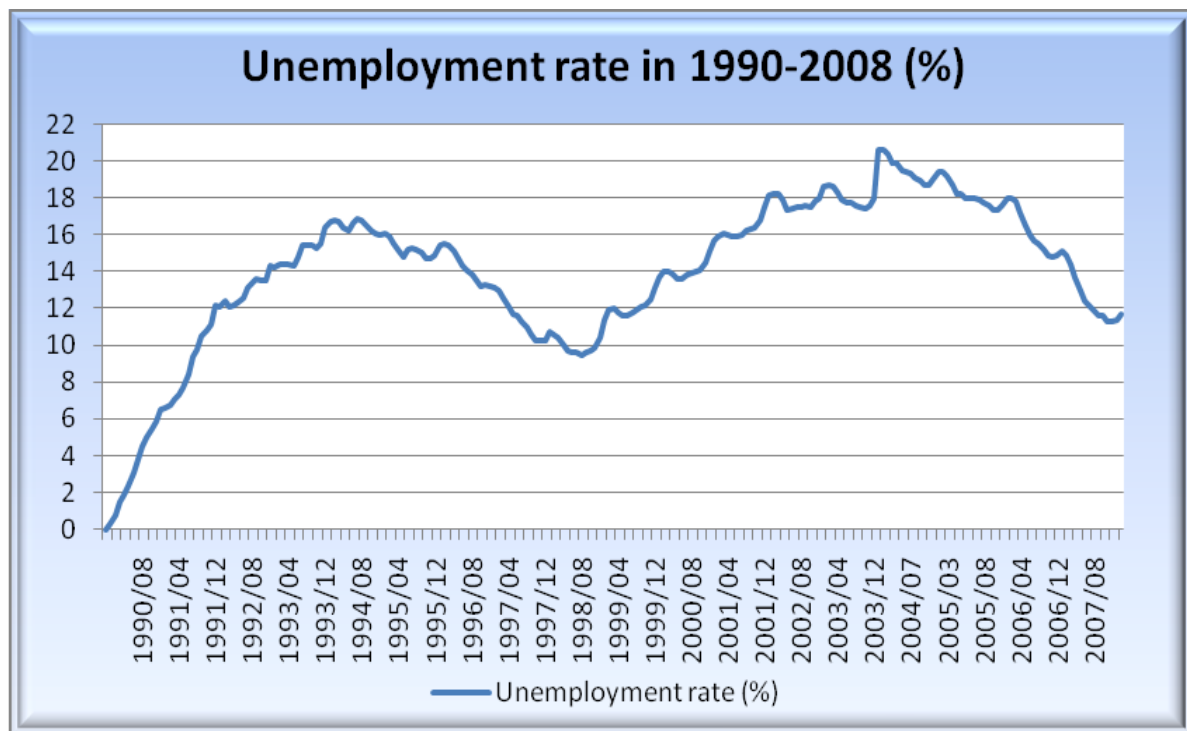
Source: Based on GUS data

The unemployment rate began to rise again in 1999, reaching 20% in 2002-2003. The population boom generation's entry in the labor market, high income taxes, high collections on insurance, and the expansion „of a gray zone" all contributed to this rise. [8]

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[7] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

[8] Ibid.

The decrease in the unemployment rate can be observed beginning in 2004 (2008: 8.9%). For many people, new and appealing perspectives for working abroad arose after Poland's entry to the EU. Many European countries opened markets of work for the Poles. In recent years, the main locations of work emigration were Germany, Great Britain, Ireland and Italy (ca. 95% from all work emigrants).[9]

From the beginnings of the transformation, the primary goal of the economic policy was to lower inflation – increase in the annual average price of goods and of consumer services (Figure 5).

Figure 5. Inflation rate in Poland in 1991-2008
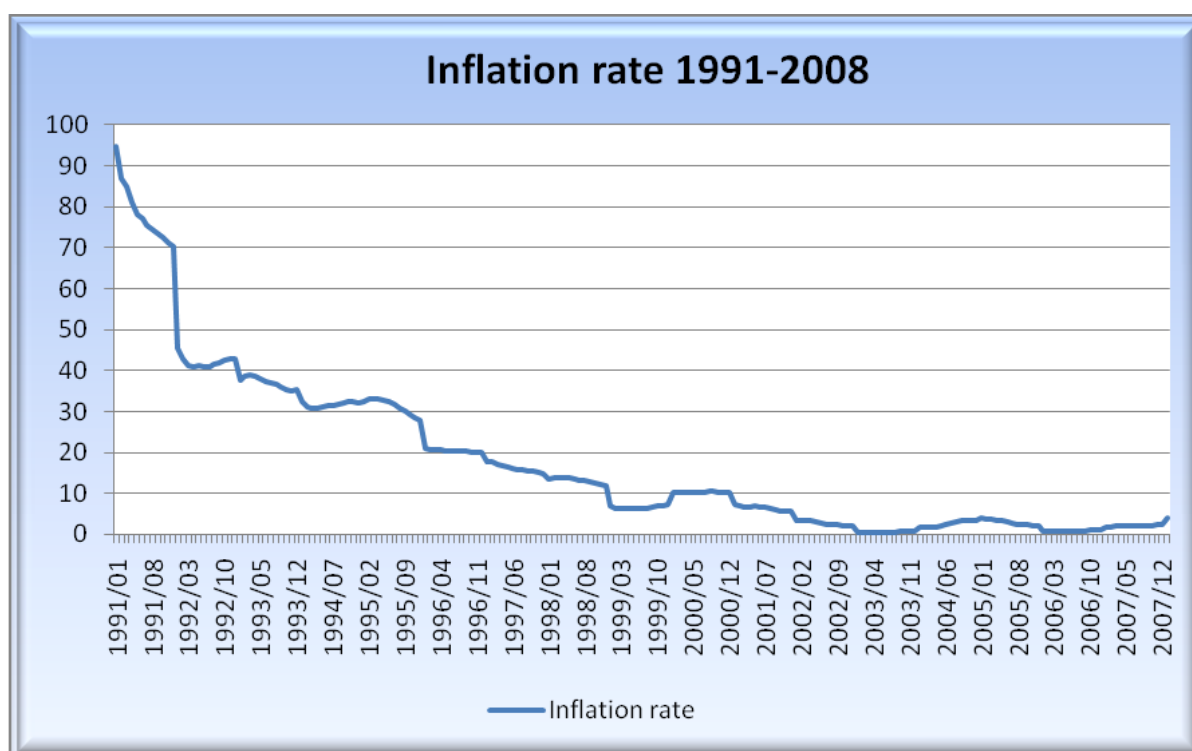
Source: Based on GUS data.

[9] Department of Analyses and Forecasting, Ministry of Economy of the Republic of Poland (2007) "Wpływ emigracji zarobkowej na gospodarkę Polski"

At the beginning of the transition, in 1990, inflation in Poland amounted to 585.8%. A radical stabilization program caused it to fall to a level of 70.3% only a year later and then gradually to 7.3% in 1999. In 2008, inflation was reduced to 4.2%.[10]

The limitation of inflation in a country lies, above all, in the hands of the central bank and in the manner in which its monetary policy is handled.

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[10] Data from Central Statistical Office of Poland

2. Determinants of Polish trade with the European Union during the transition period

2.1 Trade liberalization through economic co-operation

There is no doubt that Poland's participation in international organizations and agreements was extremely beneficial and had a huge influence on the development of the Polish economy in the period of transformation. The large range of institutional and instrumental conditions (and the resulting advantages and obligations) helped Poland along the process of economic integration and trade liberalization. The aspirations of the Polish authorities to integrate with other European countries and institutions, along with the country's entry into the European Union, allowed for the creation of a young free-market economy.

Many factors led to the changes in the international political and economic structures in Europe between 1980 and 1990. Those changes caused destruction of COMECON (The Council for Mutual Economic Assistance) in January 1991. Post-Communist countries of central Europe - Poland being one of them – found themselves in a transformative process and therefore had the possibility of establishing a new economic co-operation. The effect of this was the Central European Free Trade Agreement (CEFTA), which was created on the 21st of December, 1992, in Krakow, Poland.[11] This agreement was created for the purpose of settling a principle of the trade exchange development between the countries of Central and Eastern Europe, and undoubtedly had a huge influence on the economic developments in this part of Europe. The system referred to the introduction of a 'free trade area' among member countries. It also settled on a reduction of tariffs and various other barriers (embargo,

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[11] http://pl.wikipedia.org/wiki/CEFTA

import taxes and so on) in mutual trade. The agreement lost its significance when the majority of the CEFTA members gained entry to the European Union.

A sound basis for the economic transition in Poland was the country's association with the European Community in the early 90s. As a result of this, the Europe Agreement between Poland and countries of the EEC (European Economic Community) was signed on the 16th of December, 1991 (implemented on the 1st of February, 1994). This system laid the groundwork for relationships between Poland and the European Union; thanks to it, Poland received the status of associate country with the Union, which in result enabled the development of trade, economic, political and integration relationships between both sides.

The trade part of the European Agreement was called the Interim Agreement, which was implemented on the 1st of March, 1992. According to its postulations, the 'free trade area' was established for industrial commodities between Poland and the European Union for the subsequent 10 years.[12] Since this agreement, the restrictions on trade have been reduced to varying degrees, dependent on the types of commodities. In accordance with the timeline stipulated in the agreement, all restrictions were lifted and the liberalization was completely implemented. The long-lasting reduction of the trade barriers was based on the *principle of asymmetry,* because of the fact that Poland was regarded as a weaker partner in the relations between international traders.[13] Right after the Interim Agreement legislation, the European Union removed tariffs on industrial commodities exported from Poland to European Union. This removal, however, did not apply to all commodities. In order to stop the expansion of exports from Poland and to protect the European market, there were some curbs for a period of time on trade with "*susceptible*" commodities

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[12] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej
[13] Ibid.

like: textiles, steel and mineral products, chemicals, leather, glassware and china goods. The liberalization process in the trade of soft commodities took place gradually and selectively. Some tariffs that applied to soft commodities coming from Poland were reduced by the European Union as early as 1992 (39.6% of value of total export from Poland to EU), whereas on others, reduction took place gradually over the subsequent 3 to 5 years. In principle, the process of the liberalization of Polish export to the European Union was completed on the 1st of January, 1996 (following a decision made by European Council in Copenhagen), with a few exceptions - for different quota limitations, for example.[14]

Poland's weaker economy began to open the market on imports from the European Union gradually. Some barriers on the industrial commodities had already been lifted in 1992 (tariff removal on 25% of the value of the imports from the European Union), but this only represented a small portion of the commodities that were being imported from the European Union. Significant progress in the liberalization of Polish imports occurred after 1995 (the import tax was used until the end of 1996). The tariffs on industrial commodities were finally removed on the 1st of January 1999; only vehicles were still subjected to customs duty until December of 2001.[15]

The effect of tariffs removal in the trade of '*processed*' commodities was clearly visible from 2001 onwards. The asymmetrical way in which the removal affected exports and imports is significant: exports developed much faster than imports.[16]

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[14] Office of the Committee for European Integration (2002) "Unia celna. Znoszenie barier handlowych między Polską a Unią Europejską"

[15] European Information Department, Office of the Committee for European Integration, www.cie.gov.pl

[16] Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany strumienii handlu zagranicznego Polski i ekonometryczna prognoza obrotów na lata 2007-2009", Institute for Market, Consumption and Business Cycles Research

Poland became an official and rightful member of the European Union on the 1st of May, 2004.This meant that Poland had to standardize all aspects of its relationship with the EU, like all of its members.

Poland's accession to the European Union resulted in full liberalization of 70% of Polish turnovers and, as is the effect of common trade policy, a 60% liberalization of the remaining 30% of Polish turnovers (with non-members of European Union). The effects of total trade liberalization are observable in the export of Polish grocery goods to the European Union. Almost 10% of the export of soft and grocery commodities from Poland was the result of removing restrictions in trade with the European Union in 2005.[17]

Polish foreign trade development was influenced not only by the liberalization, but also by many other elements connected to the economic situation and transition period. It is therefore difficult to gauge how much direct influence liberalization had on access to markets and on the structure of trade between Poland and the European Union.

Poland also joined the Schengen zone in December, 2007. This agreement abolished border control for citizens of its member states. This had a significant influence on the development of border trade and the free flow of commodities.

The WTO (World Trade Organization) also largely influenced the development of the Polish economy. The changes began with the creation of the General Agreements on Tariffs and Trade (GATT) during the Uruguay Rounds, and Poland became a member on the 1st of July in 1995. The WTO supports the liberalization and development of

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[17] Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany strumienii handlu zagranicznego Polski i ekonometryczna prognoza obrotów na lata 2007-2009", Institute for Market, Consumption and Business Cycles Research

international trade by lowering tariffs, helping to obey property and intellectual rights, and by arbitrating the disputes on international trade exchange.[18]

Poland's membership in the WTO had large advantages: political and economic, particularly in the area of trade liberalization. It also meant a 37% tariff reduction on industrial commodities until 2001, a 36% tariff reduction on soft commodities until 2000, and an increase in the quality of Polish export products. These affects allowed for the increase in the rate of economic development.[19]

The OECD (Organization for Economic Co-operation and Development) is another international organization that was integral to economic development in Poland. Poland joined the OECD on the 22nd of November, 1996. Its principal tasks included the co-ordination of social and economic politics in member countries, the development of international trade and capital flow, and the development of foreign investment. The Polish accession to OECD resulted in economic progress; it allowed for the limitation and the elimination of barriers in the process of commodity exchange, for a simplified flow of services and payments, and for a free capital flow. The process of liberalizing the markets of insurance and banking services was also accelerated as the result of special regulations.

The European financial institutions played a significant role in Poland's transformation, particularly early on in the process. Thanks to them, Poland could access foreign capital, as well as loans and credits. Among the international financial institutions that supported the reforms in Poland, the following ones played a particularly important role: The International Monetary Fund (IMF), The International Bank for Reconstruction and Development, and The European Bank of

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[18] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

[19] Kaczurba, J., Kawecka-Warzykowska, E. (2002) "Polska w WTO", Instytut Koniunktur i Cen Handlu Zagranicznego

Investments (EBI). As a result of its involvement with the IMF, Poland obtained the possibility to take credits and it was also included in the international program of monetary co-operation. Poland also obtained help in the process of reforming its financial system, particularly with privatizing banks. During 1990-2000, the IMF provided Poland with loans and credits totaling ca. 1.3 billion USD. The role of the Fund was also to advise and monitor the progress of the Poland's economic transformation and its integration with the European Union.

Another institution that supported Poland's transition process was IBRD (The International Bank for Reconstruction and Development), which in the decade between 1990 and 2000 provided the country with loans and credits (ca. 4 billion USD). The loans for the structural adaptations (in the agriculture and mining industries, for example) constituted a considerable part of the total costs. The World Bank also played a crucial role as an independent adviser to a wide range of economic policies and by creating the necessary institution for an open economy to function in Poland.

In summary: Poland's accession to many international trade agreements allowed the country to obtain many economic advantages, but simultaneously caused it to lose a considerable amount of independence in the application of its own commercial policy tools. All of the events of the transformation period aimed to assure that Polish exporters were given equal opportunities to compete with foreign exporters, while simultaneously protecting the national producers against competition with foreign suppliers.

It is also an important fact that, as a result of the full trade liberalization with the EU, Poland reached a substantial quickening of economic development and significant acceleration of GDP growth.

2.2 The role of FDI in Polish trade with European Union

Foreign companies could not be registered in Poland before 1989. "Polonia" companies were the only exceptions, but they worked under special conditions. During the transition period, the situation changed. Today, many foreign businesses with foreign capital are becoming established in Poland, and almost 95.6% of the value of foreign investments in Poland comes from OECD countries.[20]

Most of these foreign investments are in the form of direct investments (FDI). According to the OECD definition (2008), accepted by its member countries, foreign direct investment is: a type of cross-border investment made by a resident in one economy (*the direct investor*). It occurs when a foreign investor has or acquires a lasting influence and interest in a foreign enterprise (*the direct investment enterprise*). This lasting interest means that there is a strategic long-lasting relationship between the direct investor and the enterprise of direct investment. There is also a significant level of interaction, which means the direct investor is involved in how the direct investment enterprise is managed. This real influence means having at least 10% of the voting power of the direct investment enterprise.[21]

Since opening its market for foreign investors in the 1990s, Poland has become a very attractive partner for companies from the EU. The value of FDI from the EU companies was ca. 47% of the total foreign investment value in 1993. Currently, 85.3% of Poland's total direct investment flows are from France, Germany, Austria, Italy, Sweden and other European Union countries. The investment from outside the

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[20] http://www.poland.gov.pl/?document=468

[21] OECD (2008) "Benchmark definition of foreign direct investment"

European Union comes mostly from the United States of America, the Netherlands Antilles, the Republic of Korea and Japan.[22]

Figure 6. Foreign direct investments in 1992-2007
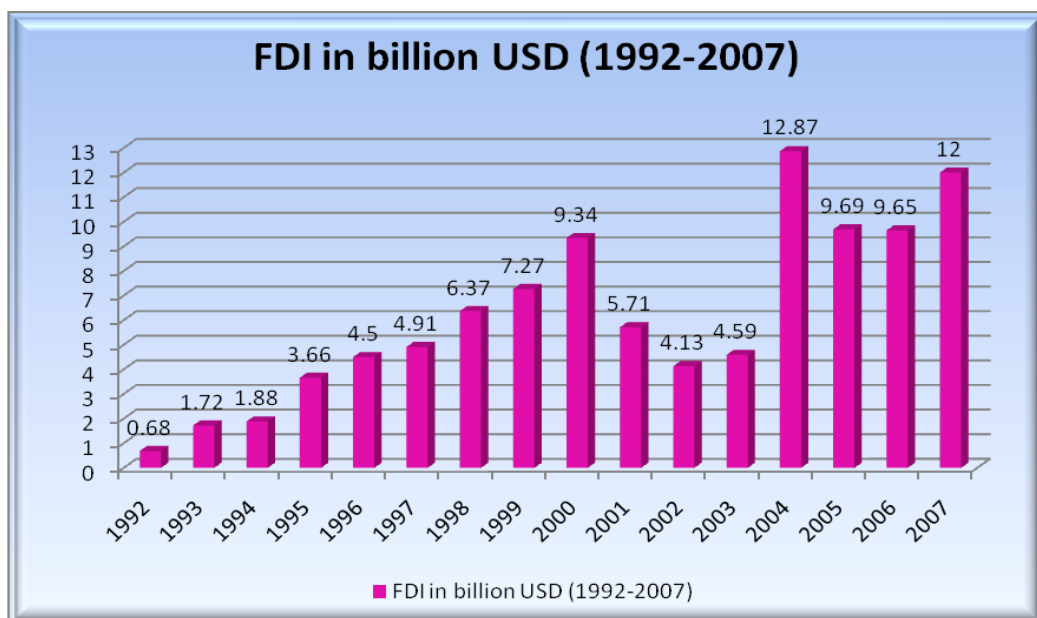
Source: Based on NBP data.

The largest direct investment inflow in 2007 was invested into Poland's manufacturing sector (20%) and real estate and other business activities (19.8%), followed by financial services (15.3%) and trade and repairs (11.9%).[23]

Foreign direct investment is perceived as one of the most important factors of economic growth. It promotes the transfer of modern technology and improves the situation of the local labour market. It improves not only the transfer of financial funds, but also the transfer of investment goods into the country.

The total value of FDI coming into Poland in the period between 1990 and 2005 was 89 billion USD.[24] The growth of the FDI in Poland is presented in Figure 6.

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[22] Departament Statystyki, Narodowy Banki Polski "Direct investment flows in Poland in 2007"

[23] Departament Statystyki, Narodowy Banki Polski "Direct investment flows in Poland in 2007"

[24] Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany strumienii handlu zagranicznego Polski i ekonometryczna prognoza obrotów na lata 2007-2009", Institute for Market, Consumption and Business Cycles Research

The foreign capital coming into the Polish economy played a large role in the process of privatisation, the restructuring of the economy, and the growth of the GDP. Foreign direct investments are also useful in explaining the dynamics of Polish export and import, particularly in trade with the EU countries during the last few years.

The dynamics of FDIs significantly influence the flow of exports and imports. If FDIs are directed to the domestic market, this may imply a systematic deterioration of the trade balance. If FDIs are performed with a focus on future export, then export exceeds the growth of import, and as a result we see an improvement in the trade balance. FDI stimulated also GDP growth in the longer run.

The domination of pro-export investments is observed from 2001 on, when the role of the foreign direct investment in the dynamics of export volume rapidly increased. According to Figure 10, Figure 11 and Figure 12, strong increase of FDI decreased the importance of other factors (for example foreign demand and real exchange rate) which influence export at the same time.

This conclusion is based on an empirical econometric model, developed by Institute for Market, Consumption and Business Cycles Research (IKCHZ). This model was created to analyse factors which explain dynamic of Polish export and import. It estimates strength of determinants of Polish foreign trade streams between years 1998-2006. All factors together influence Polish export or import in 100%. The importance of each factor has been changing during time, depending on economic situation in Poland and on situation on international market.[25]

The complicate details of this model are not discussed in this chapter, but there are presented (Figures 7-12) just parts of results useful for this work.

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[25] Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany strumienii handlu zagranicznego Polski i ekonometryczna prognoza obrotów na lata 2007-2009", Institute for Market, Consumption and Business Cycles Research

Following ca. 6 quarters of foreign direct investment, the maximum export is observable; export increased more than 0.5 billion PLN, and the accumulative effect reaches 3.3 billion PLN. At the same time, each foreign direct investment created additional imports. In the third and fourth quarter, following the investment of 1 billion PLN, import connected to this investment increased to ca. 300 million PLN and decreased to zero during ca. 50 quarters. The accumulated value of import connected to this investment after 28 quarters carried out nearly 2.5 billion PLN. This means that the total net effect (the difference between the export created by the investment and the amount necessary for investment import) for the Polish economy of foreign direct investments amounts to ca. 0.8 billion PLN from every 1 billion PLN of FDI invested. The more pro-export FDI is, the more positive the net effect for foreign trade is in the middle and long term.[26]

In recent years there has been a change in the role of foreign direct investments in explaining import dynamics. On the large scale in the mid 1990s, investment referred to groceries and the motorization industry. Those goods were produced nearly exclusively for the domestic market. The biggest FDI influence on import can be seen in 1998, when 23% of imports were a result of FDI (Figure 7).[27]

In subsequent years, the role of FDI decreased to 13.7% and rose up to 21.5% in 2006, as a new trend focused on export production (it was also caused by the appreciation of PLN). At the same time the role of the real exchange rate decreased by ca. 3.5% (to 18.1%). Domestic demand was still the largest force stimulating import (Figure 9).[28]

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[26] Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany strumienii handlu zagranicznego Polski i ekonometryczna prognoza obrotów na lata 2007-2009", Institute for Market, Consumption and Business Cycles Research

[27] Ibid.

[28] Ibid.

Figure 7. Elements explaining dynamic of Polish import in 1998
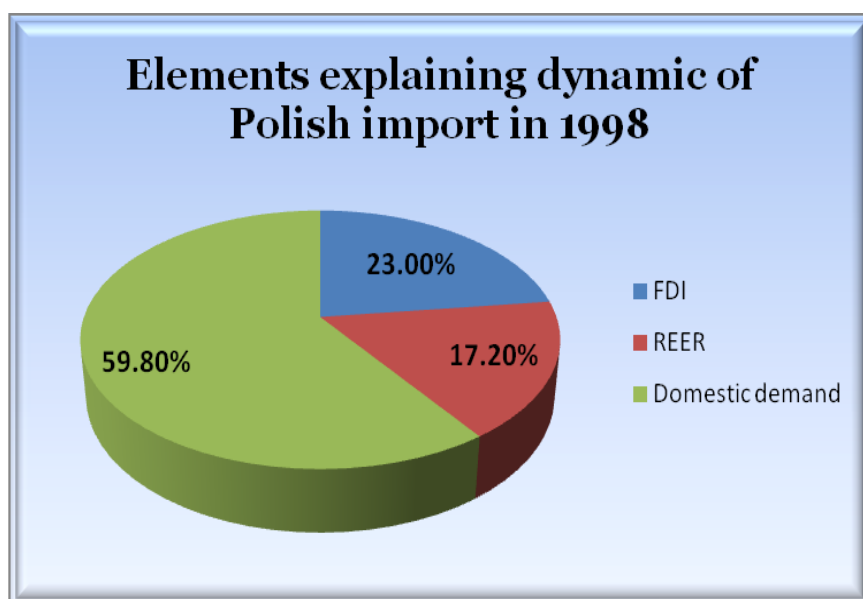
Source: Own work based on: Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany...", Institute for Market, Consumption and Business Cycles Research

Figure 8. Elements explaining dynamic of Polish import in 2001

Source: Own work based on: Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany...", Institute for Market, Consumption and Business Cycles Research

The role of foreign direct investments is clearest in the export of capital goods (mainly the export of means of transport) to the European Union: it reaches 55%. This has grown by more than 50% from 1998. At the same time, the scale of imports from the EU connected with these investments increased up to nearly 32%.

It is also possible to observe a similar tendency in the turnover of industrial commodities (manufactured goods classified chiefly by material, machinery and transport equipment and miscellaneous manufactured articles - according to SITC).

Figure 9. Elements explaining dynamic of Polish import in 2006
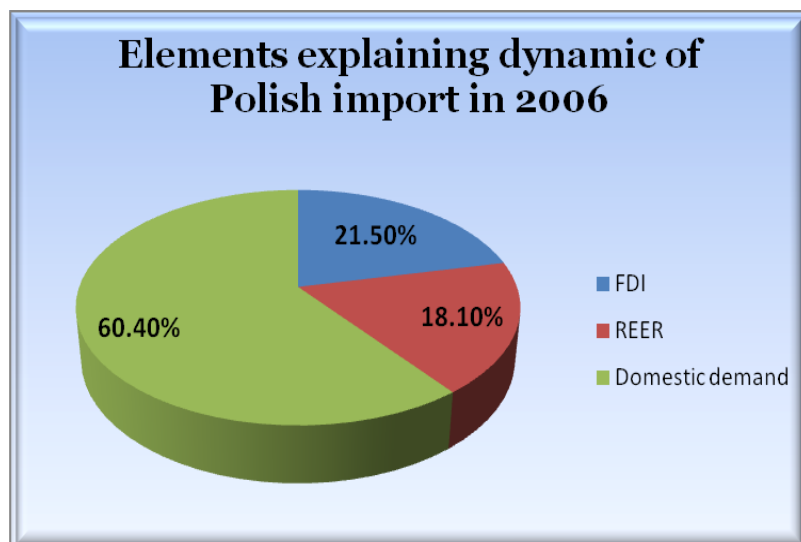
Source: Own work based on: Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany...", Institute for Market, Consumption and Business Cycles Research

Figure 10. Elements explaining dynamic of Polish export in 1998
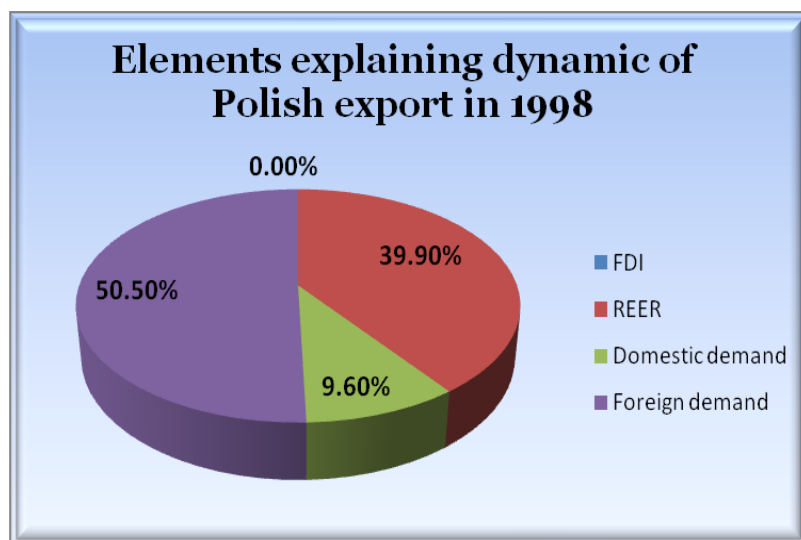
Source: Own work based on: Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany...", Institute for Market, Consumption and Business Cycles Research

Figure 11. Elements explaining dynamic of Polish export in 2001
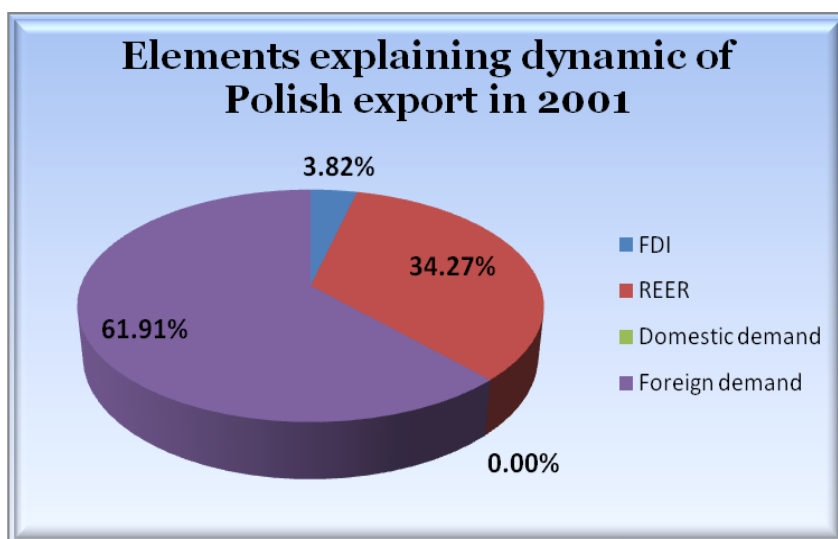
Source: Own work based on: Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany…", Institute for Market, Consumption and Business Cycles Research
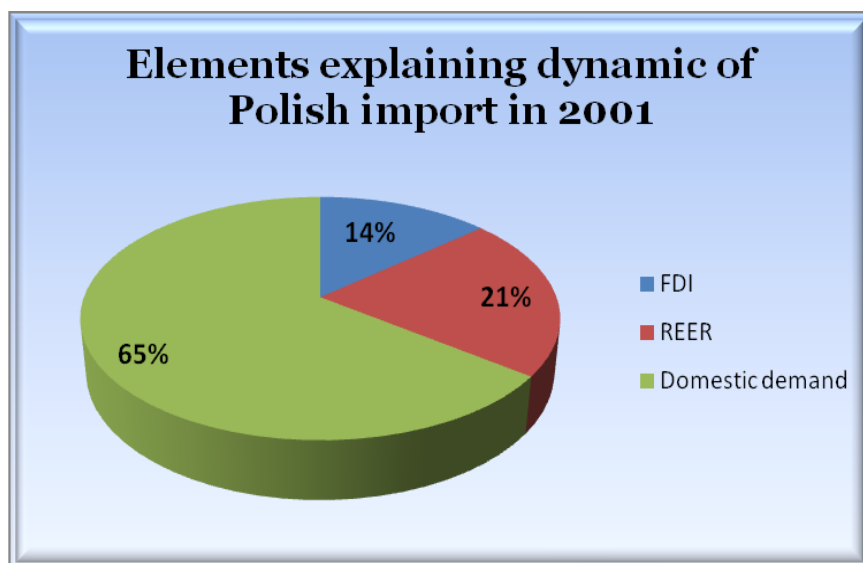
Figure 12. Elements explaining dynamic of Polish export in 2006
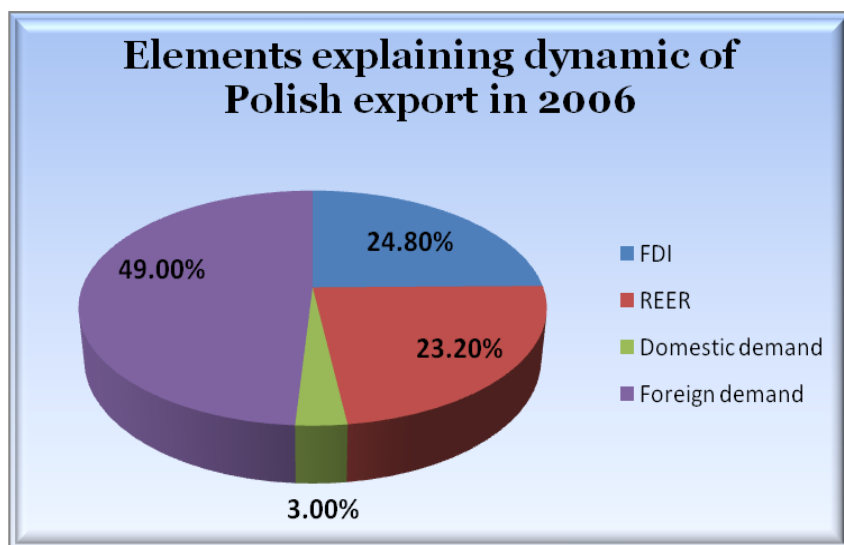
Source: Own work based on: Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany…", Institute for Market, Consumption and Business Cycles Research

The greater FDI influence on chemical imports (21.8%) than on export (15.3%) signifies the domination of foreign capital in the production of chemicals and production directed into the domestic market.

On the other hand, decreasing the role of FDI in the turnover of food imports from the EU means decreasing import's influence on production in the grocery industry.

The dependence of Polish exports on foreign demand decreased from 68.1% in 2001 to 49% in 2006 (by 19.1% in five years). During the same period, the role of the foreign direct investments in export increased by 20% (to 24.8%). It is possible to explain this process by the increase in foreign capital in projects focused mainly on export.[29]

There is also evidence of a decreased influence of the PLN exchange rate on exports (by ca. 14.5%). This was caused by the fact that the international companies who settle accounts within the capital group treated production in the subsidiary (*daughter-company)* as part of the production of their own group, therefore after the exchange rate changed, the companies regulated the import prices and size of the import share in the production.

2.3 Foreign trade structure and competitive position

During the transformation, a reorientation of business cooperation took place. Over several years, the trade exchange shifted from markets of similar levels of development represented by the countries of the former Council for Mutual Economic Assistance, to markets of the more developed countries. As a result of the transformation of the geographical structure of Polish foreign trade, trade exchange with the EU countries began to gain more importance. From 2000 to 2007, the share of the highly developed countries (including members of the EU) increased by 7.8 percentage points.[30]

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[29] Barteczko,K., Przystupa, J. (2006) "Czynniki określające zmiany strumienii handlu zagranicznego Polski i ekonometryczna prognoza obrotów na lata 2007-2009", Institute for Market, Consumption and Business Cycles Research

[30] Miszczyk, K., Pęczak, K., Szelągowski, R., Korgol-Gers, K., pod kier. Piątkowskiej, A. (2008) "Polska 2008, Raport o stanie handlu zagranicznego", Departament Analiz i Prognoz Ministerstwa Gospodarki

Figure 13. Share of Polish import and export with EU in general import and export

Share of Polish import/export with EU in general import/export

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
■ % of import from EU in general import	52	64.9	57.5	64.7	63.9	63.8	65.6	64.9	61.2	61.4	61.7	61.1	68.2	60.9	63.2	64.2
■ % of export to EU in general export	58	69.2	62.7	70.0	66.2	64.0	68.3	70.5	69.9	69.2	68.7	68.8	79.1	77.2	77.4	78.9
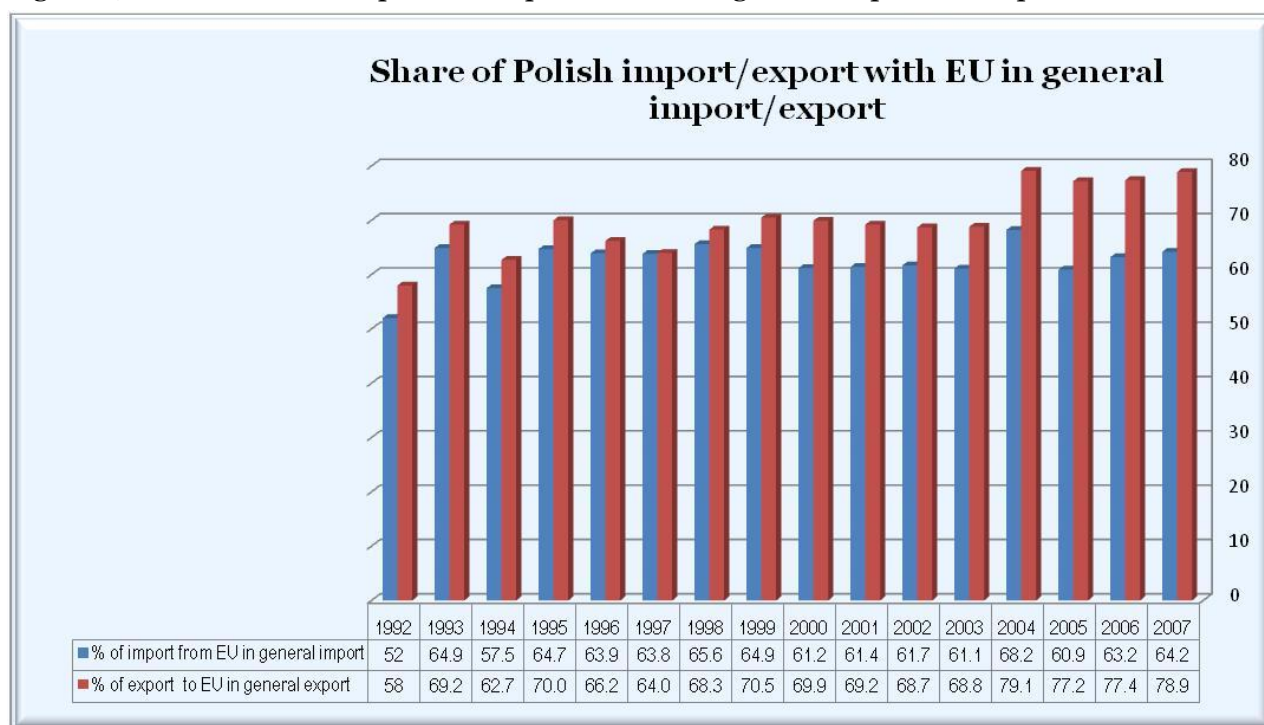
Source: Based on GUS data.

Figure 13 shows the extreme increase of the share of trade exchange with the EU in the Polish foreign trade. EU member states undeniably constitute the main market for Polish export. Analyzing the situation beginning with the first year of the transformation, exports to the EU increased from 58% of total exports in 1992 to 78.9% in 2007. The increase of imports was also significant; however, it was slightly lower than the increase in exports. The share of Polish imports to the EU increased from 52% of total imports in 1992 to 64.2% in 2007. Clear changes in those tendencies took place in 1994, when a momentary decrease of the share of both imports and exports to the EU in overall Polish foreign trade took place. A quite rapid change can be also seen in 2004, which was the result of the growth of the EU through the addition of new member states. From 2004, a clear increase of the share of export to the EU is visible: from 68.8% in 2003 to 78.9% in 2007 in relation to the total export, and a slight increase of imports from the EU in relation to the total import.

Germany has been Poland's main constant trade partner for many years (Table 1, Table 2). Exports to Germany in 1993 amounted to 36.3% of the total Polish export; in 2000 it was 35.1% and in 2007 it was 26%. Moreover, Germany's share in Polish imports also decreased slightly during recent years, from 28% to 24.4% (in 2007).

A downward tendency in the share of import and export to Germany is a result of the increased importance of Poland's remaining partners during the transformation and the growth of the EU.

However, if we consider the quantitative Poland's trade exchange with Germany during the transformation, the tendency remains upward.

Among Poland's other trade partners with the EU, the highest positions are held by Italy, France, Great Britain, and Holland, but these countries are still far behind Germany. During the last few years the importance of Poland's trade with the new membership states e.g., Czech Republic and Hungary has increased (Table 1, Table 2). Taking partners outside of the EU into consideration, the share of the turnover with Russia (an important partner in the past) in trade with Poland is marginal in comparison to the trade with Germany. The share of export to Russia in relation to total export was characterized by an upward tendency until 1997 (Table 1). Then, at the end of the nineties, it rapidly decreased, caused by the high level of economic development in Russia, an increase of industrial production and of consumer demand, and, predominantly by increased competition from Russian companies. Since 2001 we have been seeing the gradual increase of the importance of export to Russia in Polish foreign trade. During that time, the share of import from Russia had a slow increase with a significant staggering from 1998 to 2000 (Table 2).

Table 1. Geographical structure of Polish export

Share in Polish EXPORT (%)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Germany	36.3	35.7	37.5	34.6	33.2	37	36.2	35.1	34.6	32.5	32.5	30.1	28.2	27.3	26
Italy	5.2	5	4.8	5.3	5.8	5.9	6.6	6.3	5.4	5.4	5.5	6.1	6.1	6.4	6.9
France	4.2	4	3.5	4.4	4.3	4.4	4.9	5.2	5.4	6.2	6.1	6.1	6.2	6.3	6.1
Great Britain	4.3	4.5	3.9	3.8	3.6	3.9	4	4.5	4.9	5.2	4.9	5.4	5.6	5.6	5.9
Czech Republic	-	-	-	3.3	3.4	3.6	3.8	3.8	4	4	4.1	4.3	4.5	5.4	5.5
Holland	5.9	5.9	5.6	4.8	4.6	4.5	5.3	5.1	4.8	4.4	4.5	4.3	4.2	3.9	3.9
Sweden	-	-	-	-	-	-	2.5	2.7	2.8	3.3	3.7	3.5	3.1	3.1	3.2
Belgium	-	-	-	2.6	-	-	2.7	2.9	3.1	3.2	3.2	3.2	3	-	-
Hungary	-	-	-	-	-	-	-	-	-	-	-	-	-	3.1	2.9
Denmark	-	-	-	3.1	2.9	3	3.1	2.7	-	-	-	-	-	-	-
Russia	4.6	5.4	5.1	6.8	7.9	5.9	-	-	2.9	3.2	2.8	3.8	4.4	4.3	4.6
Ukraine	-	-	-	3.8	4.6	4.1	-	-	2.7	2.8	2.9	2.8	2.8	3.6	4
USA	2.9	3.4	2.6	-	2.5	2.4	2.8	3	-	-	-	-	-	-	-
others	36.6	36.1	37	27.5	27.2	25.3	28.1	28.7	29.4	29.8	29.8	30.4	31.9	31	31

Source: Based on GUS data.

Table 2. Geographical structure of Polish import

Share in Polish IMPORT (%)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Germany	28	27.5	26.7	24.7	24	25.2	25.3	24.1	24	24.4	24.5	24.4	24.7	23.8	24.2
Italy	7.8	8.4	8.3	9.8	10	9.3	9.5	8.4	8.2	8.4	8.5	7.9	7.1	6.7	6.8
France	4.2	4.5	4.9	5.4	5.9	6.4	6.9	6.4	6.8	7	7.1	6.7	6.1	5.5	5.2
Czech Republic	-	-	-	3.1	3.2	3.1	3.2	2.9	3.5	3.3	3.4	3.6	3.6	3.4	3.5
Holland	4.7	4.6	4.5	3.9	3.6	3.8	3.8	3.6	3.6	3.5	3.4	3.4	3.4	3.2	3.4
Great Britain	5.8	5.3	5.1	5.8	5.5	4.8	4.5	4.5	4.1	3.9	3.7	3.3	3.1	2.9	3.2
Belgium	-	-	-	2.6		2.8	-	-	2.7	2.8	2.6	-	2.6	2.5	2.6
Sweden	-	-	-	2.5	2.7	2.8	3.1	2.9	-	-	2.6	2.7	-	-	-
Spain	-	-	-	-	-	-	-	-	-	-	-	2.6	-	-	-
Russia	6.8	6.8	6.8	6.6	6.2	5.3	5.6	9.2	8.9	7.8	7.8	7.2	8.8	9.9	8.7
Korea	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	2.4
China	-	-	-	-	-	-	2.7	2.8	3.2	3.7	4.2	4.6	5.4	6.1	7.2
USA	5.1	3.9	3.9	4.4	4.6	3.6	3.6	4.2	3.3	3.2	2.6	-	2.4	-	-
other	37.6	39	39.8	31.2	34.3	32.9	31.8	31	31.7	32	29.8	33.6	32.8	33.7	32.8

Source: Based on GUS data.

Economic Competitiveness is understood as a capability of development under the conditions of an open economy. The degree of competitiveness is visible mainly in the general condition of a given economy in comparison with other countries. The Polish economy is considered to be open to a large degree, but the level of competitiveness is unfortunately very low. This is a result of an unfavorable production structure (too small share of highly processed production), high energy and material consumption of industries, low innovation in industries and services, and insufficient use of recent technology by the companies.

Analyzing Polish foreign trade from 1990 on, it can be assumed that, compared to Poland, competitive economies are economies that are at a similar stage in the process of economic transformation. These are mainly East-Central European countries such as: Hungary, Slovakia, Czech Republic, Lithuania and Latvia.

An important competitor for Poland in the trade exchange is also the German economy. In the period from 1990 to 1997, Poland displayed a comparative advantage over the German economy within the field of raw materials consuming goods, work consuming goods and forest-consuming goods. A lack of this advantage was visible with the intensively technological products and land-consuming products.

The competitiveness of the Polish economy in relation to the German economy is still low, but it is gradually improving. An increase in the intensity of intra-industry exchanges between the countries is being constantly observed, but the pace of that process is relatively slow.

The competitiveness of goods in Poland is based on a low cost of remuneration for highly qualified employees, and the relatively low costs of materials and energy. Labor-consuming and material-consuming goods are dominant in the commodity

structure of export. There are still low share of middle and high technological goods in structure of export.

Considering the intra-industrial competitiveness of the Polish economy, the downward tendency in its competitive advantage is highly visible during the last ten years in relation to its most important EU partners. This mainly concerns goods traditionally exported by Poland: wood, wooden goods, shoes, furniture, and sporting equipment. Poland does not have an advantage in the field of basic agricultural goods, and the country has been quite slow to catch up with others in the field of technologically intensive products.[31]

Considering economic competitiveness, a broader aspect of innovation shall be discussed, which significantly influences Poland's competitive position. Currently, Poland belongs to a group of countries with a weaker position in terms of innovation (similar to Slovakia). In the short term, there is no possibility of gaining a better position due to a lack of policy to support knowledge-based investments that develop the economy. The main problem in Poland is the decreasing investment into research and development in relation to the GDP. In 2000, the EU accepted a plan of increasing the competitiveness of the EU economy. This was called the Lisbon Strategy, and it had the aim of increasing investments into research and development to 3% of the EU's GDP in 2010. In Poland in 2006, investments into research and development increased by only 0.56% of the GDP (EU-27 average was 1.74%); the Polish target for 2010 is 1.7%.

There are a few indicators that Poland is along the process of gradually catching up with the highly developed countries who lead in with investments for research and development (Austria, Germany, Finland and Sweden), such as investments in human resources and communication technology development. Unfortunately, as far

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[31] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

as the level of research and development of the private sector or patents in high technology are concerned, the gap is huge. The weakest points in applying innovation in Poland are its weak distribution and limited application of knowledge. There is also noticed the low share of hi-tech goods in Polish export, which does not support Poland's competitive position on the global market.

Until now, Poland has specialized in developments in science - mainly in physics, chemistry, mathematics and astrophysics. There are also significant achievements in technological research for transport equipment, basic metals, pharmaceuticals, chemical products, food, wooden, rubber and plastic products.

In the export of high technology goods, electronics and telecommunication equipment, scientific equipment, aviation equipment, computers, office equipment, and chemical substances play leading roles. During the last few years, the share of electronics and telecommunication equipment has increased significantly, while the share of pharmaceuticals and weapons decreased.[32]

Development and research centers of foreign corporations in Poland are known for their high levels of innovation, meaning their high quality and the potential of the Polish staff. Despite this, these centers carry out research mostly for the needs of the global - not the local - market. Until Poland builds relations between these corporations, the scientific environment, and the local companies, it will occupy a low position in the world and in Europe as far as innovation is concerned, and this will continue to be reflected in Polish foreign trade.[33]

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[32] Departament Strategii i Rozwoju Nauki Ministerstwa Nauki i Szkolnictwa Wyższego, Ministerstwo Nauki i Szkolnictwa Wyższego (2008) "Strategia Rozwoju Kraju 2007-2015: Strategia rozwoju nauki w Polsce do 2015 roku"

[33] Instytut Gospodarki Swiatowej SGH "Polska: raport o konkurencujnosci 2006: Rola innowacyjności w kształtowaniu przewag konkurencyjnych"

2.4 Exchange rate policy

The closed economy rules were obligatory in Poland until 1989; therefore, the Polish currency, the Zloty, was a non-exchange currency.

There was a state controlled exchange rate at this time, set by the National Bank of Poland. Regulations and strict limitations on the international capital flow and on the currency exchange were the main reasons that the dynamic "black" exchange market existed in Poland and in other Eastern European countries.

Many changes and evaluations in Poland's economy and political system began around 1990. The economic stabilisation program and the transformation system also included changes in Poland's currency regime (Table 3).

The adjustable peg was the first step in the currency regime transformation. The Zloty as a fixed exchange rate has only been compared to the US Dollar since January 1990. The Zloty has also been pushed through a devaluation process. The main goal of the financial policy was to reduce high inflation.[34]

Subsequent changes came in 1991, when the Zloty was compared to a group of five currencies, which created a currency basket - USD, DM, GBP, FRF, and CHF. Each currency related to the currency basket in different percentages: 45% USD, 35% DEM, 10%GBP, 5% FRF and 5% CHF. This currency basket was valid until the end of 1998. From January 1999 until April 2000, the currency basket was formed by 55% EUR and 45% USD.

The government fixed the *preannounced crawling peg* to devaluate the Zloty systematically and gradually over the period between 1991 and 1995. Aside from the day-to-day depreciation according to the currency basket (a percentage set monthly),

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[34] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

there were also additional devaluations made by the Polish Central Bank (NBP) in subsequent years.

There were several radical modifications in the monetary and currency system in 1995. Due to a very high inflation in preceding years, a re-adjustment of the Polish Zloty exchange rate took place in January 1995, when a new monetary unit replaced the old monetary unit, according to a certain ratio (from the January 1995 there is new symbol for Polish currency – PLN). Using the International Monetary Fund's standards, the Polish Zloty was slowly prepared to become more elastic and fully related from opened market rules. That is why the preannounced crawling peg system was replaced by a crawling peg within narrow bands around central parity. It was +/- 7% around central parity until 1998. Furthermore, the NBP set up a new *fixing exchange rate* (set every day) for transactions with commercial banks.[35]

The NBP decided to stop interventions on the currency market in 1998. In the same year, the monthly rate of the crawling devaluation was cut three times by the Monetary Policy Council – from 1% to 0.5% - to reach inflation expectations. The Council broadened the exchange rate oscillation band from +/- 7% to +/- 12.5%. The liberalization of the currency policy in 1998, paired with considerable foreign investments, created good opportunities for increasing the value of the Polish currency. The appreciation process was maintained throughout the whole year, excluding the period of the Russian financial crisis.[36] In 1999, the mechanism of the crawling peg was still valid, but there were small modifications in the currency basket. The rate of devaluation was reduced to 0.3% and the scope of changes spread to +/-15%.

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[35] Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

[36] Departament Komunikacji Społecznej, Narodowy Bank Polski (1999) "Raport Roczny 1998"

Table 3. Changes in Poland's currency regime

Date	Currency policy	Comments
do 1990	Adjustable peg system in comparison with the currency basket	Frequent and large PLN devaluations
01.01.1990	Introduction of fixed currency	Fixed course in relation to the USD
17.05.1991	Fixed currency system	The introduction of the basket of currency: USD %, DM 35%, GBP 10%, FRF 5%, CHF 5%; PLN devaluation in comparison with USD 16,8%
26.02.1992	The introduction of the crawling peg devaluation system	PLN devaluation on level 12% in relation to the currency basket, crawling rate 1,8% monthly; fixed currency basket
16.05.1993	Crawling band system	Oscillation band: +/- 7%
01.01.1995	Crawling devaluation	Denomination of PLN (10 old PLN trucked on the new 1PLN); fixed currency basket
06.03.1995	Crawling devaluation	PLN exchange rate settlement in the transactions between the National Bank of Poland and commercial banks on the level +/- 2% from NBP average exchange rate
08.09.1995	Crawling devaluation	Oscillation band +/-7% around central parity; crawling rate 1% monthly; fixed currency basket
17.07.1998	Crawling devaluation	Oscillation band +/-10% around central parity; crawling rate 0,65% monthly; fixed currency basket
28.10.1998	Crawling devaluation	Oscillation band +/-12,5% around central parity; crawling rate 0,5% monthly; fixed currency basket
01.01.1999	Crawling devaluation	Oscillation band +/-12,5% around central parity; crawling rate 0,5% monthly; changes in currency basket: Euro 55%, USD 45%
25.03.1999	Crawling devaluation	Oscillation band +/-15% around central parity; crawling rate 0,3% monthly; fixed currency basket
12.04.2000	Floating PLN	PLN liberalization, abolition of currency basket, central parity and crawling devaluation

Source: Based on NBP data and Misala, J. (2006) "Makroekonomia gospodarki otwartej", Wydawnictwo Politechniki Radomskiej

The NBP stopped policy of fixing transactions with commercial banks. The process of depreciation of Polish currency in comparison to the last year was observed.[37]

The Council of Ministers decided to change the exchange rate system in Poland and float the Polish Zloty in April 2000. A consequence of independent floating was the abolition of central parity, the crawling devaluation mechanism, and the currency basket, as well as the limitation of the exchange rate's oscillation from central parity.[38]

The National Bank of Poland stopped interventions on the currency market in 1998, and the exchange rate ceased to be an instrument of monetary policy.

This was an important decision for the flexibility of the exchange rate, and for increasing the autonomy of the interest rate policy.

There were also other important arguments to support changes in the currency system. A floating exchange rate regime was an element of Poland's preparations for to join the Economic and Monetary Union. The second argument was decreasing the risk on the domestic financial market.

In accordance with present government plans, the entry to the Euro zone should be possible in 2012. First, Poland must join the ERM2 exchange rate mechanism (for a minimum of two years) to create an equilibrium exchange rate and to negotiate conditions with the European Commission. According to current law regulations in Poland, it is possible to use the Euro for settling payments where one side is the consumer or the receiver of services.

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[37] Departament Komunikacji Społecznej, Narodowy Bank Polski (2000) "Raport Roczny 1999"

[38] Departament Komunikacji Społecznej, Narodowy Bank Polski (2001) "Raport Roczny 2000"

3. Real exchange rate vs. trade balance with the European Union during economy transition in Poland

3.1 Marshall-Lerner condition

In this section, there will be a brief analysis of the direct effects of real depreciation on export, import and trade balance (net export).

Due to O. Blanchard, the real depreciation can affect the trade balance in these ways:

- X ↑ - in this situation, real depreciation makes Polish goods cheaper abroad, it leads to an increase in demand for Polish goods and to an increase of export in Poland.

- Q↓ - foreign goods are relatively more expensive in Poland, so consumers prefer to buy domestic products; this situation leads to a decrease in the import of foreign goods.

- ϵ↑ (relative price of foreign goods) – this increases the price for the same quantity of import goods

To compensate for the increase in import prices, import must decrease end export must increase enough to have an increase in net export (trade balance). This is what is called *Marshall-Lerner condition* (after some time, real depreciation leads to an improvement in the trade balance)[39].

$$NX \equiv X - \epsilon Q$$

$$\text{Where: } \epsilon\uparrow, X \uparrow, Q\downarrow$$

$$\rightarrow NX\uparrow$$

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[39] Blanchard, O. (2003) "Macroeconomics", Prentice Hall, p.372

3.2 Theory review of the J-curve effect

As was already stated, real depreciation leads to an increase in export and to a decrease in import. These changes in dynamics can be observed, but not immediately. Over time, there are short-run and long-run effects, beginning with the deterioration of the trade balance, followed by an improvement of the trade balance after some time. This reaction of the trade balance on the real depreciation, assume the form of the letter J (begins with a dip down, and then rises up). That is why this is traditionally known as the J-curve effect.[40]

Figure 14. The J-curve
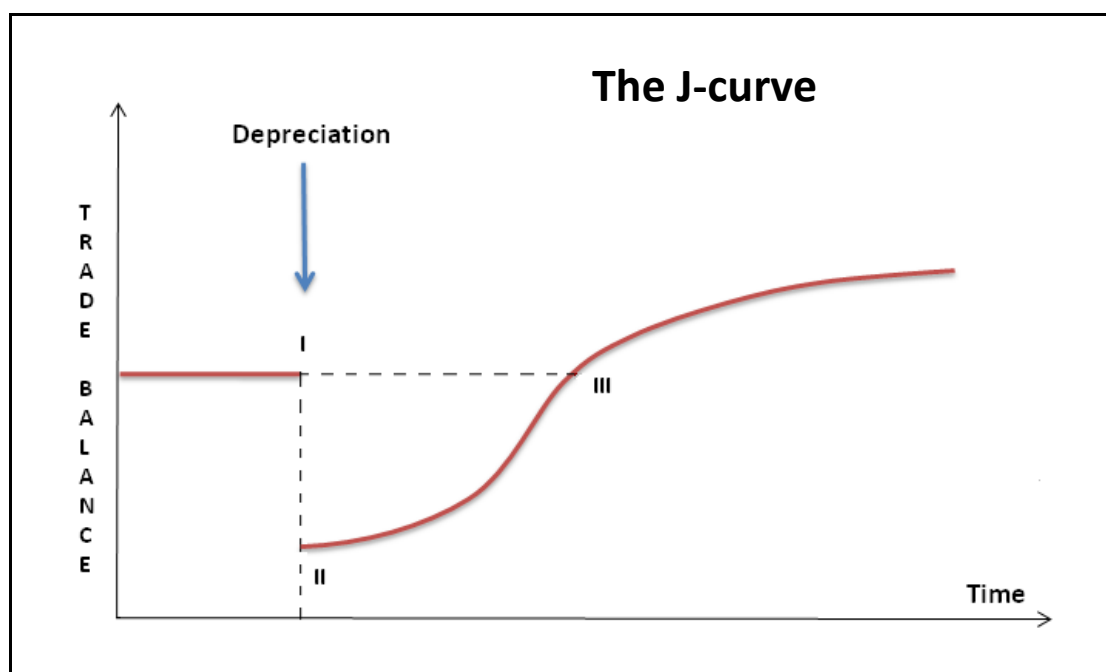
Source: Own work based on Blanchard, O. (2003) "Macroeconomics", Prentice Hall

The J-curve is formed because in the first few months following depreciation, the effect is observable in prices (the move from point I to point II in the Figure 14). Trade balance can deteriorate significantly in this period, because most of the export

[40] Blanchard, O. (2003) "Macroeconomics", Prentice Hall

and import orders are divided over time and many trade decisions are still based on the old real exchange rate (REER).

Until consumers realize that relative prices have changed, companies make new contracts, calculate new prices, or find new, cheaper suppliers; the real depreciation does not significantly change the quantity of export and import. During this time, depreciation causes the net export to decline (*real exchange rate increases, but neither X nor Q adjust very much initially*), which negatively affects the trade balance (point II in the Figure 14).

After some time, the effect of the changes on relative prices in export and import becomes stronger and stronger. Due to the Marshall-Lerner condition, the response of export and import is greater than the price effect, resulting in changes in import and export quantities. As export begins to increase and import decreases, it results in an improvement in the trade balance (the move from point II to point III in the Figure 14).

ϵ – the real exchange rate (the price of foreign goods in terms of domestic goods)

Q – import

X – export

NX – net export (trade balance)

$$NX \equiv X - \epsilon Q$$

The response of the trade balance on the real exchange rate changes:

$$X, Q - \text{unchanged}, \epsilon \uparrow \rightarrow (X - \epsilon Q) \downarrow$$

$$\text{or: } X, \epsilon \uparrow; Q \downarrow \rightarrow (X - \epsilon Q) \uparrow$$

That effect also shows that elasticity of export and import prices varies over a period of time: *"That is why in the short-run the values of the price elasticity of imports and exports will be relatively low and in the-long run relatively high".*[41]

The effect of the real exchange rate on the trade balance and the J-curve effect in open economies has been the subject of many empirical studies. While most of them indicated the existence of a J-curve effect, there are many researchers who have a differing point of view and have denied in their studies that changes in the real exchange rate traditionally caused a J-curve effect.

Examples and a brief overview of the economic science literature focused on the impact of changes in the real exchange rate and of the J-curve will now be presented.

Many known researchers developed and used different methodologies and found many different ways trying to answer the question: *Is there a J-curve effect?* It is also not surprising that different research methodologies, time periods, and methods of data collection, even for the same country, can have different results.

The Marwah and Klein (1996) research on the relation between the real exchange rate and trade balance in U.S. and Canada showed confirmation of the J-curve effect. *"The trade balance initially declines after depreciation, followed by a trade balance improvement - the typical J-curve effect. However, after several quarters there seems to be a tendency for the trade balance to worsen."*[42]

A. Z. Baharumshah (2001) researched the existence of the J-curve effect in the trade balances of Thailand and Malaysia with the United States and Japan (1980 to 1996). He concluded that there is: *"a stable and positive long-run relationship between trade balance and the exchange rate. The evidence on the short-run response of the*

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[41] Cota, B., Erjavec, N. (2006) "The impact of exchange rate changes on the trade balance in Croatia: an analysis of the j-curve effect", Economic and Business Review for Central and South - Eastern Europe, vol. 8, p. 307

[42] Marwah, K., Klein, Lawrence R. (1996) "Estimation of J-Curves: United States and Canada", The Canadian Journal of Economics, vol. 29, p. 523-539

trade balance supporting the J-curve effect is mixed. A delayed J-curve seems to apply to Thailand data, whilst no support for the J-curve was found in Malaysian data".[43]

According to T. Stučka (2004), there is confirmation for the existence of J-curve in Croatia. He proved that: *"the depreciation of the domestic currency by 1 % results in an improvement of the Croatian trade balance by between 0.94% and 1.3%, and where the new equilibrium would be established for approximately two-and-a-half years".*[44]

A. K. Rose and J. Yellen (1989) proved in their works that there is no clear existence of the J-curve effect in developing and developed countries, the United States being among them. According to them: *"an analysis of the US trade balance using US data (from 1960 to 1985) indicates that the US has not traditionally shown a J-curve."*[45]

M. Bahmani-Oskooee and J. Alse (1994) also analysed the influence of changes in the real exchange rate on trade balance. Their data set contained 41 developed and developing countries. Both of their results indicated a co-integration between the trade balance and the real exchange rate for only six countries. For the remaining countries, there was no observable effect between these two variables, indicating that devaluations cannot have any long-term effects on the trade balance. [46]

Based on the American economy, M. Bahmani-Oskooee and T. Brooks (1999) also confirmed the research results of A. K. Rose and J. Yellen regarding the lack of short-

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[43] Baharumshah, A. Z. (2001) "The Effect of Exchange Rate on Bilateral Trade Balance: New Evidence from Malaysia and Thailand", Asian Economic Journal, vol. 15, p. 291-312

[44] Stučka, T. (2004) "The Effects of Exchange Rate Change on the Trade Balance in Croatia", International Monetary Fund

[45] Rose, A. K., Yellen, J. L., (1989) "Is There a J-Curve?", Journal of Monetary Economics. vol. 24, p. 53

[46] Bahmani-Oskooee, M., Alse, J. (1994) "Short-Run versus Long-Run Effects of Devaluation: Error-Correction Modeling and Cointegration", Eastern Economic Journal, vol. 20, p. 453-464

run impact of the real exchange rate on the trade balance. However, they showed that real depreciation does significantly influence the trade balance in the long run. [47]

M. Bahmani-Oskooee with T. Kantipong (2001) researched the economic data (1973 to 1997) for Thailand and its five main trading countries: Germany, Japan, Singapore, United Kingdom, and the United States. At the end, they found evidence of the J-curve only in Thailand's trade with the U.S. and Japan. [48]

In other studies, T. Singh (2002) created a model to test the J-curve hypothesis and to analyse the effect of the exchange rate's influence on the trade balance in India. *"The exchange rate is measured alternatively in terms of the trade and export weighted real effective exchange rate. The model variables are tied together in a long run equilibrium relationship."*[49]

3.3 Data and methodology

Main research aim:

- In the first part of the analysis, it should be proven that REER has a significant influence on the import, export and trade balance in Poland. In this case, an analysis of correlation in SPSS 16.0 and Gretl 1.8.4 software was applied.

- The next step in the research should check and prove the J-curve phenomenon; does real depreciation leads to an increase in export and a decrease in import, and after some period improvement of trade balance? Data diagrams will be used to find confirmation for this thesis.

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[47] Bahmani-Oskooee, M., Brooks, T. (1999) "Bilateral J-Curve between U.S. and her trading partners", Review of World Economics, vol. 135, p. 156-165

[48] Bahmani-Oskooee, M., Kantipong, T. (2001) "Bilateral J-Curve Between Thailand and Her Trading Partners", Journal of Economic Development, vol. 26, p. 107

[49] Singh, T. (2004) "Testing J-curve hypothesis and analysing the effect of exchange rate volatility on the balance of trade in India", Empirical Economics, vol. 29, p. 227

The geographic range of research includes Poland and all 15 members of the European Union: France, Germany, Austria, Italy, Belgium, Holland, Luxembourg, Ireland, Spain, Portugal, Finland, Great Britain, Sweden, Denmark and Greece. This area has increased in 2004 by another 10 countries: the Czech Republic, Slovakia, Slovenia, Lithuania, Latvia, Estonia, Hungary, Malta, Cyprus and Poland, and in 2007 another two: Bulgaria and Romania. This analysis does not take Polish trade partners from outside the EU into account. During the last few years, Poland changed diametrically its trade structure and trade directions. The Polish market has been opening mainly in the direction of European countries, and it has been focused on integration with the EU.

The data used for this analysis begins in 1993 and 1994. Although some important economic changes took place earlier, before 1993, this limitation is caused by the availability of comparable data in the 1990s and changes in methodology of processing statistical data used by the Central Statistical Office in Poland. Additionally, any economic activity, such as import and export, which is expressed in Euro (currency), relates only to the period following the year 1996 (officially, the Euro has existed since 1995). The data collection is limited by the last quarter in 2007, just after Poland approached the Schengen zone, and fully opened its borders and economies to the EU. All data in analysis have been standardised and recalculated into quarter data to make them comparable (some detailed data, like the monthly or the daily data, were calculated as average into quarter data).

The values of import, export and trade balance have been presented and compared mostly in two currencies: PLN, Euro (since 1996), but also in the U.S. Dollar (before 1996). This will allow us to observe exact changes from the fluctuations in currency rates and their influence on trade.

The data presented here was found in the Central Statistical Office in Warsaw in Foreign Trade (Information and Statistical papers) and in Prices in the National Economy. Some of the data was also accessible through reports by the National Bank of Poland.

In this work, the main research focused on the real exchange rate as a factor of foreign trade changes. There is a fundamental difference between nominal exchange rates and real exchange rates. The nominal exchange rate refers to the relative price of two currencies and the real exchange rate is the relative price of two output baskets, which takes the purchasing power of currency into consideration.

Values of both exchange rates show a similar decline and appreciation of rates on the graphs, with slight time differences. REER is a relative assessment of goods produced in Poland, in relation to the price of goods produced in the EU. In other words, it allows estimate how many goods could be bought in Poland and how many could be bought abroad with a given amount of currency.

If a real exchange rate is increasing in a given country, then foreigners have to pay more for the goods produced in this country, and as a result the export decreases. At the same time, goods brought from abroad are cheaper in this country, which influences import. This is called a real appreciation of currency.

On the other hand, if real exchange rate is decreasing in a given country, then foreign buyers pay less for goods produced in that country, which causes export to increase, and it also means that goods imported from abroad are more expensive. As a result import is smaller, and the whole process is called a real depreciation of currency.

In order to construct REER, GDP or CPI (consumer price index), a deflator is needed. In this analysis, the REER index is deflated by the CPI, which is a measure of the

average price of consumer goods and services purchased by households, and reflects consumption prices more accurately.

Construction of REER:

REER- real exchange rate

NER- nominal exchange rate

CPI – consumer price index (inflation rate)

General formula:

$$REER = \frac{NER \times Price\ of\ EU\ goods\ in\ Euro}{Price\ of\ Polish\ goods\ in\ PLN}$$

It was possible to use ready-made REER values, made available by The Bank for International Settlement; however, due to the need to select only Poland's trade relations with the EU (excluding its partners from outside of the EU) for the analysis, an adequately modified formula was designed.

In this case it is:

$$REER = \frac{NER \times CPI(EU)}{CPI(PL)}$$

The nominal value of the exchange rate (PLN/Euro) was made available by the NBP (National Bank of Poland). The CPI index value for Poland comes from GUS (Central Statistical Office) statistical yearbooks, whereas the value for CPI for the EU is based on the Eurostat (the Statistical Office of the European Communities) database.[50]

[50] Eurostat, EU economic data pocketbook 2008

3.4 Analysis

In the analysis of correlations, using the programs SPSS 16.0 and Gretl 1.8.4, a range of variables has been used: import, export and trade balance in PLN and Euro as dependant variables, REER as an independent variable.

The analysis showed a strong correlation of REER variable to import and export variables in PLN. The correlation coefficient was 0.733 for export and 0.773 for import (significant at 1% level). Along with this, there is a weaker, but still clear correlation between the REER and the import and export rate in Euro (0.707 and 0.719). Following this analysis and taking the passing of time into consideration, the correlation becomes considerably stronger. The REER achieves maximal influence on export after about 4 quarters (correlation coefficient = 0.762) and on import after nearly 6 quarters (correlation coefficient = 0.821). In summary, the REER changes outstrip fluctuations of import and export from about 4 to 6 quarters, as well as the trade balance.

In this statistical model, the coefficient of determination (R^2) for the relation between REER and import variables is 0.597, and for the relation between REER and export variables, it is 0.538. This means that, in this analysis, about 60% of the import value and about 54% of the export value can be explained by the REER variable. Although there is a strong correlation between variables, the explanation of import and export variables given by an independent variable is relatively good, but not perfect.

Since the beginning of the analysed period - that is from the year 1993 to 2007 - the long run observation shows a clear trend of real depreciation between the 2nd quarter of 1997 and the 4th quarter of 2003 (from point A to point D, Figure 15).

Figure 15. Polish REER (in relation with EU)
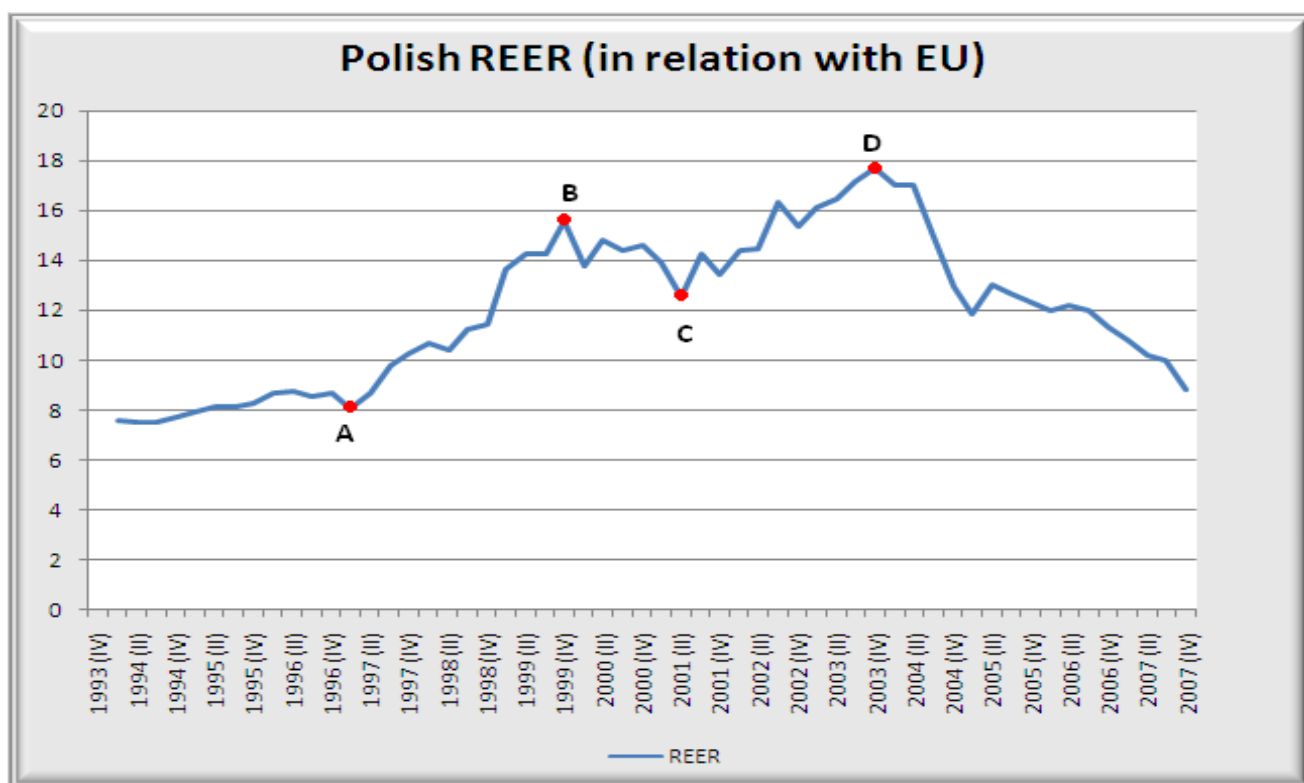
Source: Own work.

This was when the real depreciation reached the highest value and the real value of PLN was the weakest (point D). After that period, a gradual real appreciation of PLN is visible - taking into account only the dependence between Poland and the EU.

At this time, can be differentiated two partial periods of real depreciation of PLN (from point A to point B, then from point C to point D – marked in Figure 15 in red) and two periods of real appreciation of PLN (from point B to point C and from point D to the end of the evaluated period), which will be described in more detail based on Figure 15.

Table 4. REER – grow rate.

| | REER | | | | |
	Quarterly grow rate of REER	Index (based on year 1994)		Quarterly grow rate of REER	Index (based on year 1994)
1994 (I)			2001 (I)	-4.997	83.73
1994 (II)	-0.265	-0.26	2001 (II)	-11.024	65.49
1994 (III)	-0.399	-0.66	2001 (III)	12.240	88.57
1994 (IV)	2.720	2.12	2001 (IV)	-6.257	77.47
1995 (I)	2.525	4.76	2002 (I)	6.819	90.45
1995 (II)	2.463	7.41	2002 (II)	0.520	91.45
1995 (III)	-0.247	7.14	2002 (III)	11.240	115.69
1995 (IV)	1.937	9.26	2002 (IV)	-6.090	103.31
1996 (I)	4.509	14.42	2003 (I)	4.429	112.73
1996 (II)	1.030	15.61	2003 (II)	2.173	117.46
1996 (III)	-2.103	13.23	2003 (III)	4.055	126.65
1996 (IV)	1.496	14.95	2003 (IV)	3.127	133.96
1997 (I)	-8.162	6.27	2004 (I)	-3.985	125.00
1997 (II)	7.699	15.14	2004 (II)	0.124	125.28
1997 (III)	11.021	29.40	2004 (III)	-14.023	97.57
1997 (IV)	4.919	36.09	2004 (IV)	-15.676	70.80
1998 (I)	3.664	41.27	2005 (I)	-8.797	56.99
1998 (II)	-2.573	37.73	2005 (II)	8.669	71.89
1998 (III)	7.231	48.46	2005 (III)	-2.424	67.82
1998 (IV)	1.741	51.09	2005 (IV)	-2.813	63.23
1999 (I)	16.344	80.61	2006 (I)	-3.033	58.43
1999 (II)	4.142	88.41	2006 (II)	1.494	60.83
1999 (III)	0.013	88.44	2006 (III)	-1.290	58.78
1999 (IV)	8.314	105.52	2006 (IV)	-6.372	49.27
2000 (I)	-12.874	82.08	2007 (I)	-4.377	43.01
2000 (II)	6.853	95.48	2007 (II)	-5.999	34.92
2000 (III)	-2.788	90.18	2007 (III)	-2.444	31.70
2000 (IV)	1.419	92.92	2007 (IV)	-12.966	16.58

Source: Own work based on Eurostat data.

The first partial real depreciation took place in the first half of 1997 (from point A) and it increased in the 1st quarter of 1999 (REER growth rate, in comparison to the previous quarter, amounts to 16.34%, Table 4), until it reached its maximum in the 4th quarter of 1999 (point B – increased by 105.52% compared to 1993, Table 4).

Real depreciation did not result in the improvement of the export growth rate in relation to the growth rate of import to the EU's countries, as was expected. In the same period, the import growth rate was even significantly higher than the export (Table 5), and it did not decrease for a long period of time. In the 4th quarter of 1997, the export growth rate, in comparison to the previous quarter, amounted to 13.17%, and import to 19.36% (Table 5).

When observing the Polish trade balance for this period of time (Figure 17), its unfavourable trend is clearly visible (increasingly negative values); however, there was a small improvement in the period from the 4th quarter of 1997 to the 1st quarter of 1999, when the tendency to drop was not too strong and the trade balance slightly improved.

By the end of the given period, a gradual increase of Polish import and export is visible (Figure 16), with an increasing difference in their growth rates, with import in the lead. In the 1st quarter of 2000, the total growth rate for export amounts to 567.56% in relation to 1999 (as the beginning year), whereas the import growth rate amounts to 669.84% (Table 5). The fact that the import growth rate is quicker than the export growth rate results in a greater trade balance deficit (Figure 17).

Figure 16. Export and import in Poland
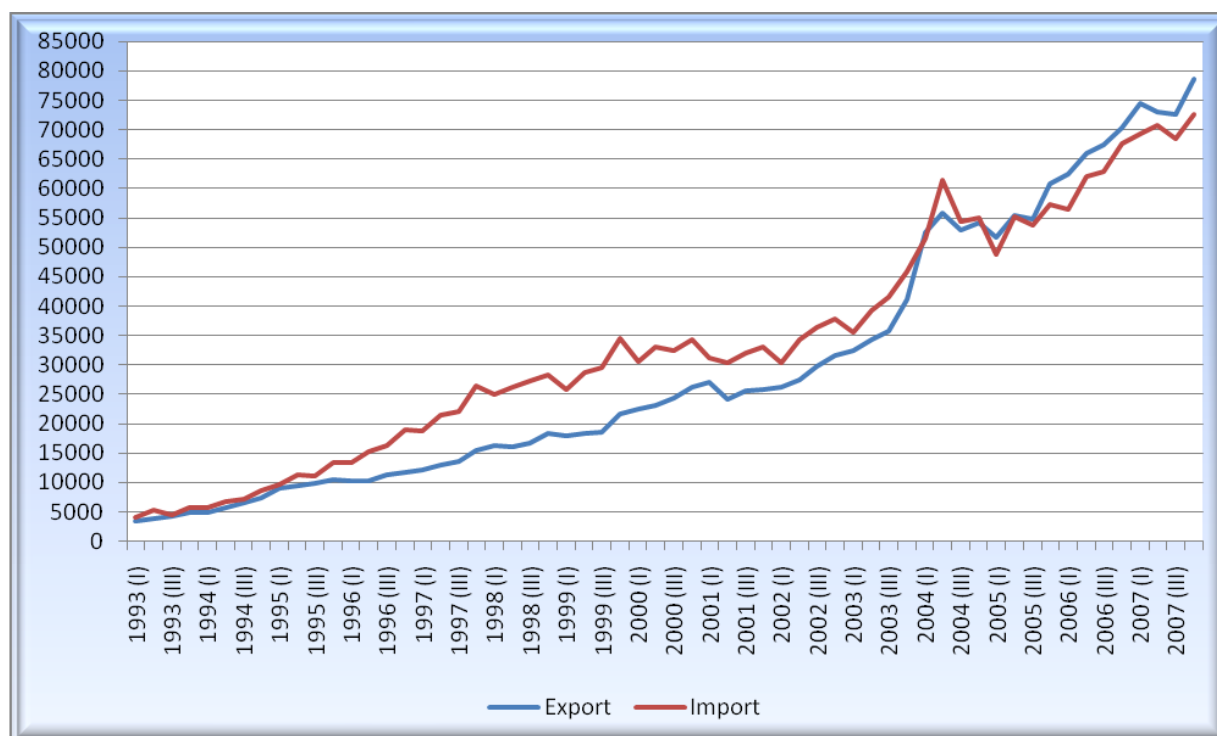
Source: Based on GUS data.

Figure 17. Trade balance in Poland
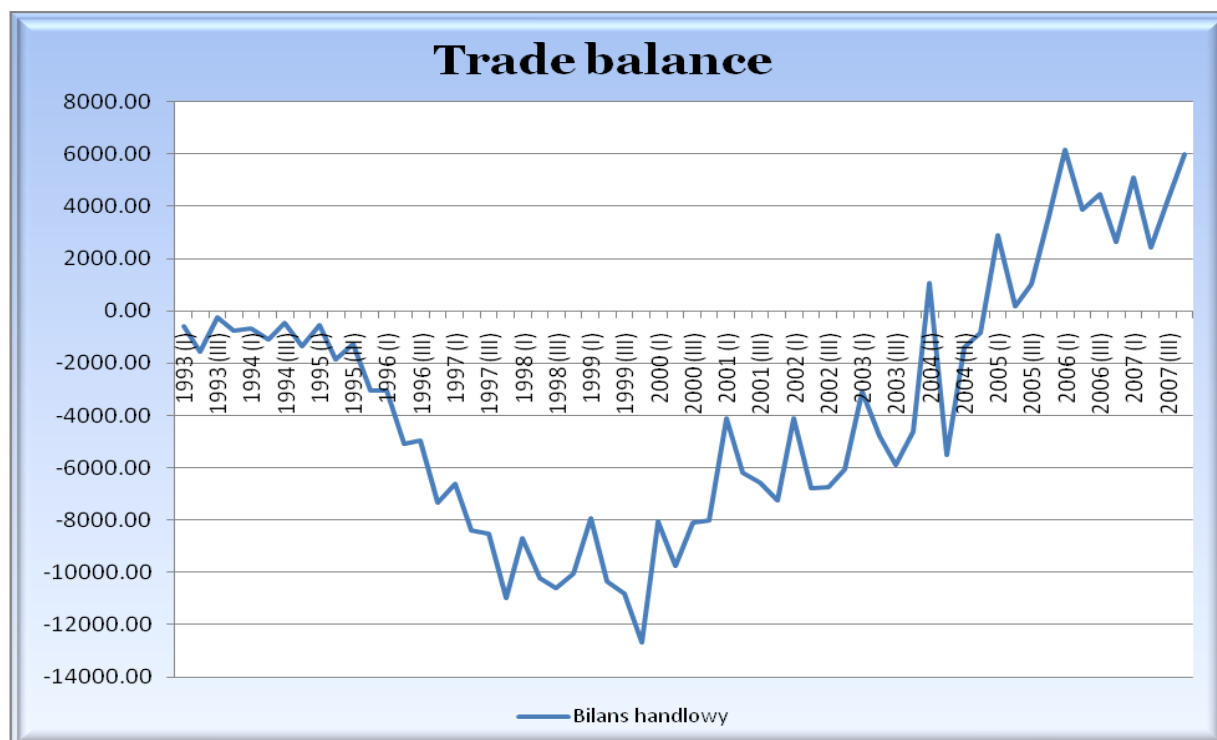
Source: Based on GUS data.

Table 5. Growth rates of export and import

Years and quarters	Value of export (current prices in mil. PLN)	Quarterly growth rate of export	Index (basis year: 1993)	Value of import (current prices in mil. PLN)	Quarterly growth rate of import	Index (basis year: 1993)
1993 (I)	3372.4			3970		
1993 (II)	3780.1	12.089	12.089	5344.7	34.627	34.627
1993 (III)	4263	12.775	26.408	4502.1	-15.765	13.403
1993 (IV)	4865.5	14.133	44.274	5642.1	25.322	42.118
1994 (I)	4941.9	1.570	46.540	5626.9	-0.269	41.736
1994 (II)	5696.1	15.261	68.903	6799.6	20.841	71.275
1994 (III)	6643.5	16.632	96.996	7105	4.491	78.967
1994 (IV)	7316.5	10.130	116.952	8662	21.914	118.186
1995 (I)	9098.4	24.355	169.790	9636.3	11.248	142.728
1995 (II)	9479.8	4.192	181.100	11357.8	17.865	186.091
1995 (III)	9903.6	4.471	193.666	11171.7	-1.639	181.403
1995 (IV)	10381.8	4.829	207.846	13413.8	20.069	237.879
1996 (I)	10252.8	-1.243	204.021	13312.3	-0.757	235.322
1996 (II)	10240.1	-0.124	203.644	15336.7	15.207	286.315
1996 (III)	11396.3	11.291	237.928	16359.8	6.671	312.086
1996 (IV)	11708.5	2.739	247.186	19036.7	16.363	379.514
1997 (I)	12210	4.283	262.057	18823.5	-1.120	374.144
1997 (II)	12967.5	6.204	284.518	21355.5	13.451	437.922
1997 (III)	13566.7	4.621	302.286	22074.9	3.369	456.043
1997 (IV)	15354.4	13.177	355.296	26349.6	19.365	563.718
1998 (I)	16257.9	5.884	382.087	24951.8	-5.305	528.509
1998 (II)	16047	-1.297	375.833	26283.3	5.336	562.048
1998 (III)	16744.8	4.348	396.525	27349.4	4.056	588.902
1998 (IV)	18320.1	9.408	443.236	28392.1	3.813	615.166
1999 (I)	17960.1	-1.965	432.561	25885.5	-8.829	552.028
1999 (II)	18311	1.954	442.966	28661.8	10.725	621.960
1999 (III)	18641	1.802	452.752	29474.6	2.836	642.433
1999 (IV)	21708.7	16.457	543.717	34400.9	16.714	766.521
2000 (I)	22512.8	3.704	567.560	30562.7	-11.157	669.841
2000 (II)	23212.4	3.108	588.305	32955.5	7.829	730.113
2000 (III)	24371.2	4.992	622.666	32464.3	-1.490	717.741
2000 (IV)	26317.2	7.985	680.370	34352.7	5.817	765.307
2001 (I)	27010.7	2.635	700.934	31113.4	-9.430	683.713
2001 (II)	24212.2	-10.361	617.952	30386.2	-2.337	665.395
2001 (III)	25557.8	5.558	657.852	32113	5.683	708.892
2001 (IV)	25724.5	0.652	662.795	32993.6	2.742	731.073
2002 (I)	26213.1	1.899	677.283	30342.1	-8.036	664.285
2002 (II)	27408.6	4.561	712.733	34208.8	12.744	761.683
2002 (III)	29649	8.174	779.166	36389.7	6.375	816.617
2002 (IV)	31705.4	6.936	840.144	37752.9	3.746	850.955
2003 (I)	32391.3	2.163	860.482	35480.6	-6.019	793.718
2003 (II)	34389.4	6.169	919.731	39192.2	10.461	887.209
2003 (III)	35673.2	3.733	957.799	41580.3	6.093	947.363
2003 (IV)	41228.5	15.573	1122.527	45860.7	10.294	1055.181
2004 (I)	52592.5	27.563	1459.498	51546	12.397	1198.388
2004 (II)	55870.6	6.233	1556.701	61371	19.061	1445.869
2004 (III)	53004	-5.131	1471.700	54391.1	-11.373	1270.053

2004 (IV)	54117.4	2.101	1504.715	54948.7	1.025	1284.098
2005 (I)	51787.2	-4.306	1435.619	48893.5	-11.020	1131.574
2005 (II)	55483.4	7.137	1545.220	55302	13.107	1292.997
2005 (III)	54808.2	-1.217	1525.199	53776.8	-2.758	1254.579
2005 (IV)	60811.8	10.954	1703.220	57192	6.351	1340.605
2006 (I)	62526.1	2.819	1754.053	56367	-1.443	1319.824
2006 (II)	65924.4	5.435	1854.821	62075.1	10.127	1463.605
2006 (III)	67359.8	2.177	1897.385	62902.3	1.333	1484.441
2006 (IV)	70344.3	4.431	1985.882	67717	7.654	1605.718
2007 (I)	74373.3	5.728	2105.352	69274.6	2.300	1644.952
2007 (II)	73098.5	-1.714	2067.551	70664.7	2.007	1679.967
2007 (III)	72513.7	-0.800	2050.211	68369.1	-3.249	1622.144
2007 (IV)	78663.5	8.481	2232.567	72680.3	6.306	1730.738

Source: Own work based on GUS data.

In the period from the 1st quarter of 2000 to the 2nd quarter of 2001, there is a gradual real appreciation of PLN (from point B to point C), with a short period of real depreciation in the 2nd quarter of 2000.

From the 3rd quarter of 2001 (point C), we can again see a real depreciation of PLN, lasting up to the 4th quarter of 2003 (point D). According to Figure 15, real depreciation reached its maximum in point D, where the REER growth rate amounted to 113.96%, compared to the base year (Table 4).

The impact of real depreciation on export and import is gradually visible after a number of quarters.

In Table 5, there is a rapid increase of the export growth rate, visible mainly in the 4th quarter of 2003 (15.57% in comparison to the previous quarter), and in the period of the 1st quarter of 2004 (27.56% in comparison to the previous quarter). As a result, in the 1st quarter of 2004 there is, for the first time, a surplus of export over import in the examined period (PLN 52592.5 million for export and PLN 51546 million for import). Although there is also a significant increase of the import growth rate, it is smaller than the export growth rate.

This increase is clearly visible on the trade balance graph (Figure 17), which after reaching the highest negative value in the 4th quarter of 1999 (the difference between

import and export amounts to PLN 12692.20 million), increases towards positive values. It reaches positive values for the first time in the evaluated period in the 1st quarter of 2004. Then, for a year, the trade balance shows an import surplus. Beginning in the 1st quarter of 2005, Poland has had a constant export surplus in the trade with the European Union's countries.

As a result, in the years of 1999 to 2005, there was a visible improvement of the trade balance. This was connected with a real depreciation of currency in Poland in this period, which influenced the speed of the export growth rate and the limiting of the import growth rate (with a constant increase of these two values at the same time) – Figure 18. This effect is visible as a J-curve effect.

Figure 18. REER and trade balance (1993-2007)
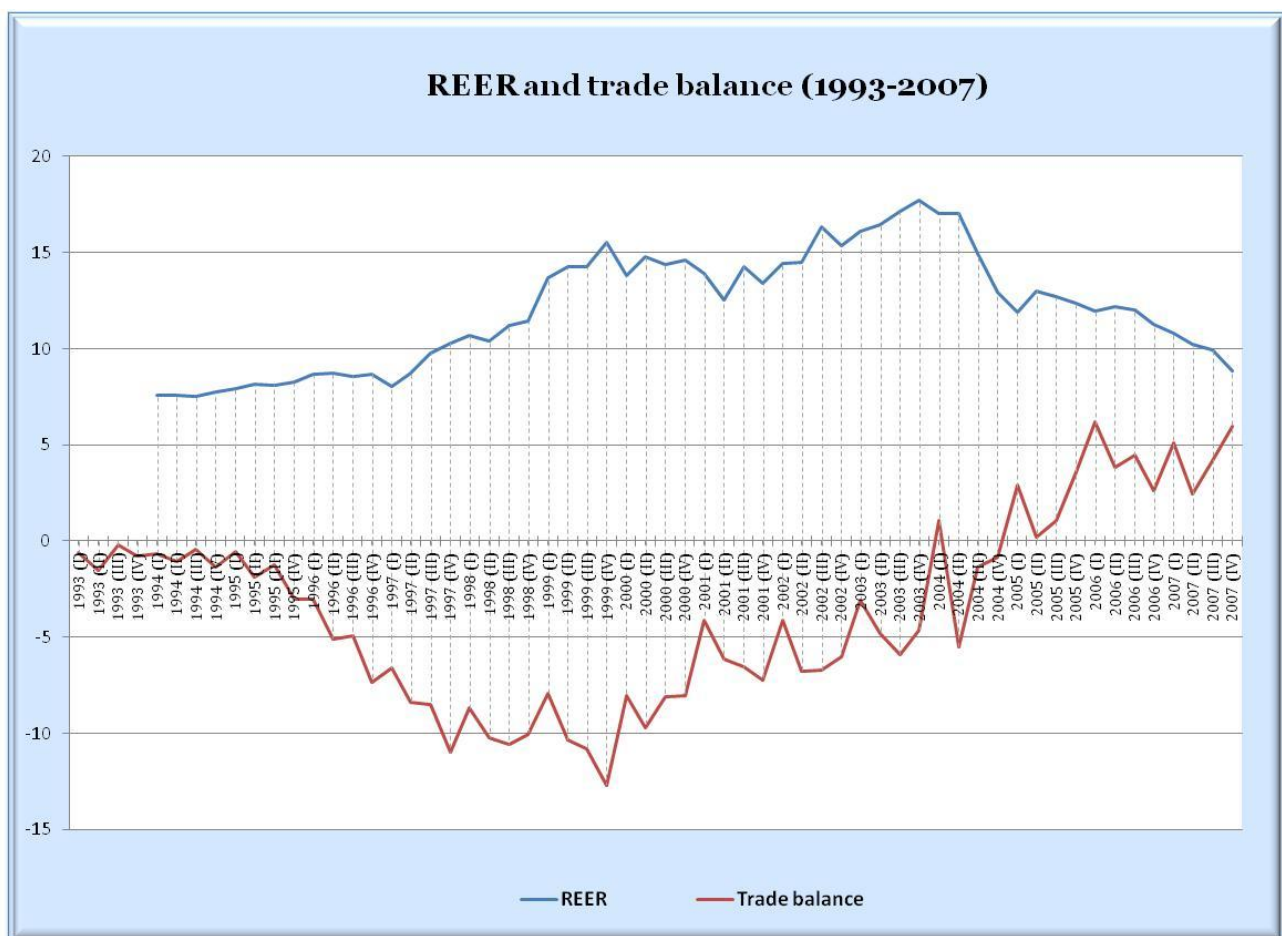
Source: Own work.

4. Conclusions

According to the assumptions of this paper's thesis, the significant impact of the REER on the changes in the balance of trade during the transformation period in Poland should be checked and confirmed. The next objective was to establish whether the impact of the REER on import and export resulted in the J-curve effect.

REER charts and the balance of trade from 1993 to 2007 are an indication that the J-curve effect was present in the Polish economy during transformation (Figure 19: J-curve made in Excel as polynomial trend line of trade balance, order 4).

Figure 19. J-curve: Poland
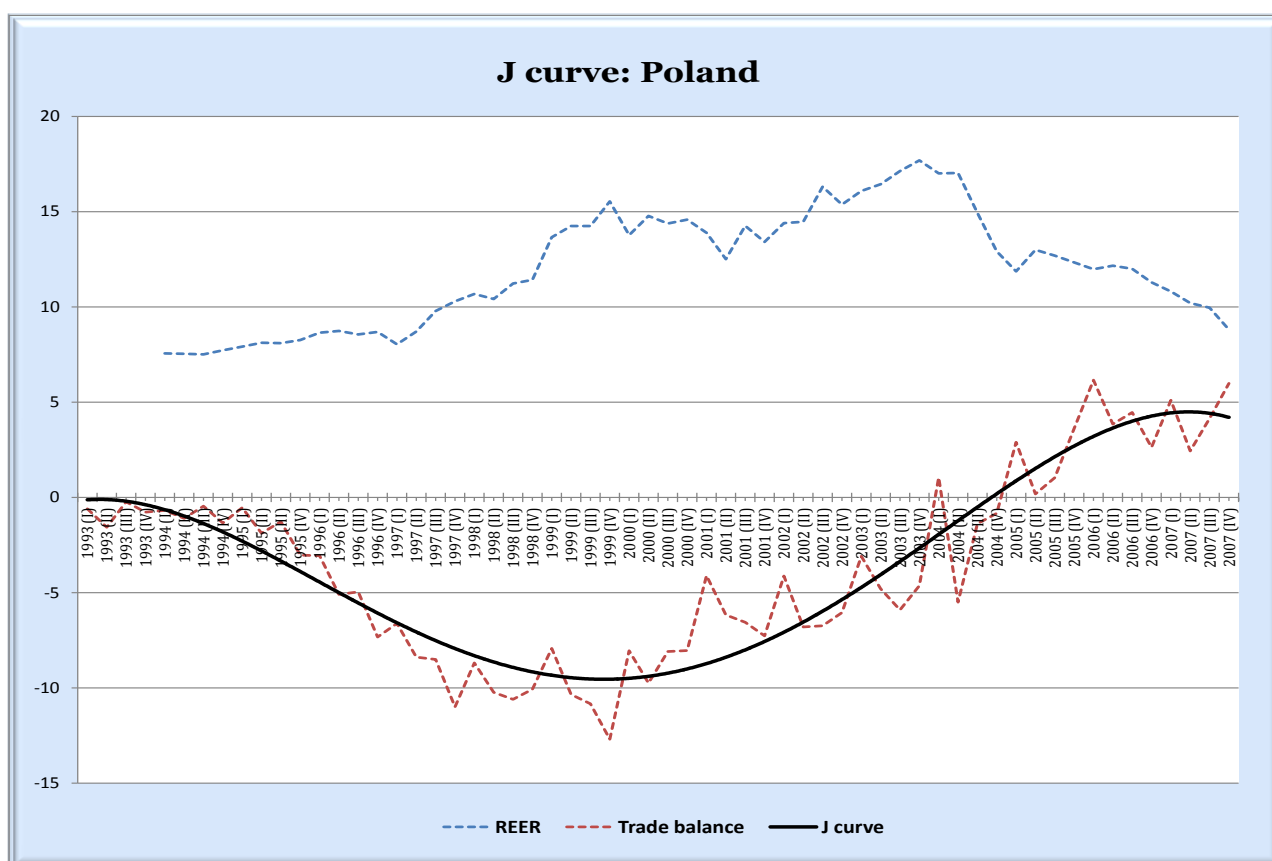
Source: Own work.

The impact of the REER on export and import, visible as a characteristic curve, is clearly noticeable only in the long-term period, which does not exactly follow existing economist's theories. According to Paul R. Krugman and Maurice Obstfeld, J-curve effects for most countries with an open economy lasted between six months and one year after real depreciation.[51] In this respect, Poland, which underwent great economic and political changes, is quite different from economies that have been stabilized and completely open for many years.

In the beginning of the transformation, Poland experienced currency depreciation, i.e. a decrease in value, which continued until the fourth quarter of 2003. According to the Marshall-Lerner condition, this fact should have a significant impact on the rate at which export increases and should slow down the rate at which import increases. This, however, did not happen. The 1990s saw a stable increase of export and import in Poland (with varying intensities in dynamics), but the significant changes in dynamics of export occurred later. The J-curve effect was disturbed mostly by an unstable economic transformation in Poland. Unfortunately, Polish export and import in the 1990s were still subject to numerous limitations and barriers, which were gradually liberalized by trade agreements and alliances.

Trade barriers and customs imposed on Poland at that time did not allow for a quick increase in export. At the same time, a significant increase of the import rate from EU countries was observed. One of the important factors in the increase of import was the high demand of the Polish domestic market, with no possibilities to meet market requirements by domestic production. The FDI is another factor which had considerable influence on import increase.

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[51] Krugman, P. R., Obstfeld, M. (2002) "International Economics. Theory and Policy", Addison-Wesley Longmans, p. 465

Only the beginning of the liberalization of trade with Poland had a visible impact: the positive change of increased exports and the improvement of the trade balance in the second term of real depreciation until 2001.

After Poland joined the EU, the ending of the liberalization process and the removal of trade barriers were observed, resulting in exports quickly increasing and in a decrease of import growth. Until 2007, there was a visible improvement of the trade balance and an export surplus.

The main conclusions resulting from the work and the analysis are the following:

- The J-curve effect can be disturbed by trade barriers and by the lack of an open economy. In this case, import and export are „artificially" suppressed and the trade balance is disturbed.

- A long period of transformation resulted in the J-curve effect taking a long time to manifest itself. The effect, to a large extent, caused changes that resulted in long-term structural changes in the economy, rather than business and short-term changes.

- The analyzed period shows the strong impact of various factors (not only the real exchange rate, which was a result of the exchange policy, among other things), on Polish trade: foreign direct investments, trade liberalization, domestic demand, foreign demand, and economic competitiveness (Figure 20).

Figure 20. Determinants of Polish trade balance.
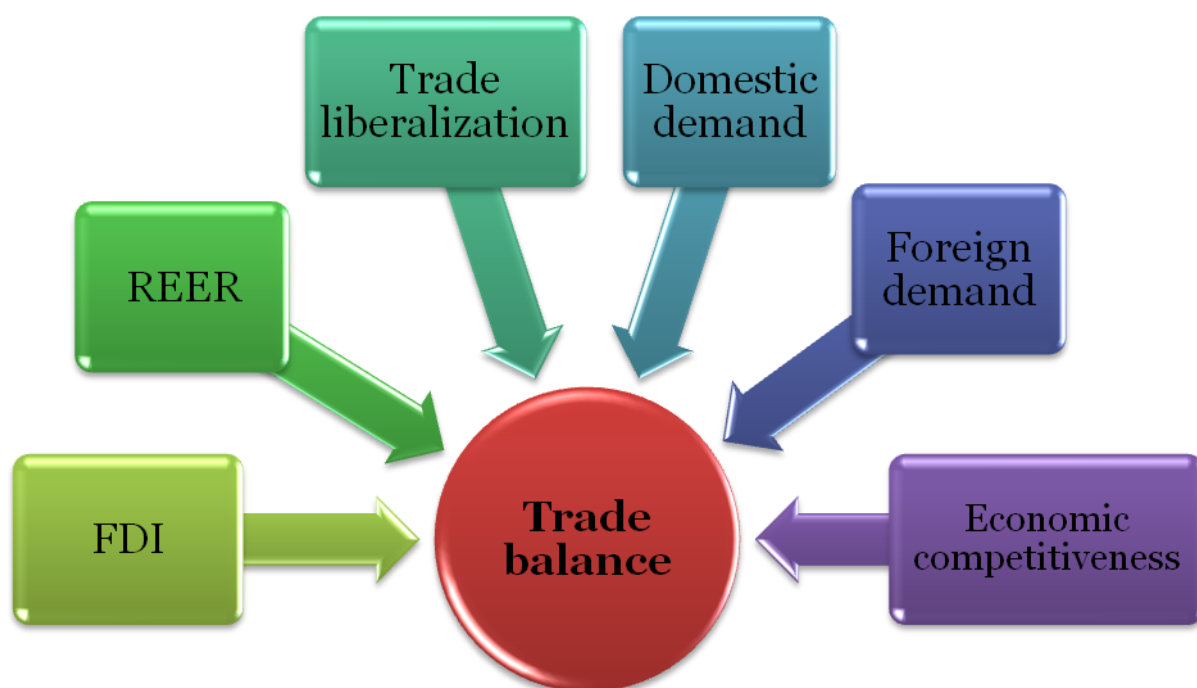
Source: Own work.

- Pursuant to the analysis, the REER has a 60% impact on import and a 54% impact on export (taking only the binary correlation into consideration). This means that the remaining factors also have quite a significant impact on the Polish trade balance. Moreover, the intensity of the relations between the factors and the trade balance changes in time, depending on the national economic and political situation.

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Curriculum vitae

PERSONAL DETAILS

Name	MAGDALENA KAROLINA KARGOL
E-mail	magda.kargol@gmx.at
Nationality	Polish

WORK EXPERIENCE

Date	February - June 2009
Employer	Studio Doradztwa Europejskiego,Warsaw
Function	Project coordinator
Responsibilities	Organized and coordinated training financed by EFS, worked as a supervisor of training groups during courses; general office duties

Date	June 2008
	European Football Championship EURO 2008
Employer	UEFA and FARE (FairPlay - VIDC), Vienna
Responsibilities	Responsible for service and support of fans, working with a variety of organizations, distributing information, cooperation with the media, and campaigning against racism in football

Date	July 2005
Employer	HKŻ Kalisz
Function	Instructor at sailing camp
Responsibilities matters	Responsible for teaching youth to sail; dealt with organizational camp

Date	September 2006
Employer	Embassy of the Republic of Poland in Vienna, Economic Department
Function	Trainee - assistant
Responsibilities	Monitored and reported press information; took part in economic conferences and meetings; collected information about tenders procedures in Austria; translated documents and carried out office duties

Date	July – September 2003
Employer	UNIMAX Sp. z o.o., Warsaw
Function	Trainee
Responsibilities	Involved in basic office activities, foreign trade procedures, and preparation of documents; worked at the front desk and was responsible for office supply, organizational matters and provided customer service

EDUCATION

Date	March 2004 -
Type and location	Master studies – Vienna University, Austria
Specialization	Management: International marketing (in English and German language)
Diploma	Masters Thesis: "Influence of real exchange rate on the Polish trade balance"
Date	May 2003
Diploma	the LCCI certificate in Business English
Date	October 2000 – February 2004
Type and location	L. Koźmiński Academy of Entrepreneurship and Management, Warsaw, Poland
Specialization	Marketing and management
Diploma	Bachelor's degree
Date	September 1996 – June 2000
Type and location	High School: XXVIII LO im. J. Kochanowskiego, Warsaw, Poland
Specialization	Mathematics and physics
Diploma	Graduated with High School certificate (advanced mathematics)

LANGUAGE SKILLS

Polish	Native Speaker
English	Advanced
German	Advanced
Russian	Basic (-business)

OTHER SKILLS AND COMPETENCES

· Professional training and experience in leading presentations using various techniques, including MS PowerPoint

· Experience in marketing research and writing reports

· May 2005: Co-organizer and instructor of a sailing camp for the Erasmus students

· 2000-2001: member of a youth economic organization „TYGRYSKI"; organized conferences and meetings

· Technical skills: driving licence category B; MS Office, MS Project, SPSS, ADONIS, basic HTML, basic Adobe Photoshop

WORK INTERESTS

Project management, event marketing, international and marketing, advertising

HOBBY	Travelling, skiing, sailing, windsurfing, tae-box, photography, jewellery design