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REGIONAL ASPECTS OF THE ECONOMY MODERNIZATION: THE QUALITATIVE EVIDENCE FROM EU COUNTRIES

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Abstract: *This research uses statistical analysis based on World Bank (2021) indicators to assess the modernization of the Polish economy during the period of transformation and accession to the EU. In particular, the change of socio-economic indicators of Poland's development in 1995-2020, indicators of the structure of Poland's economy in 1995-2020, the structure of the gross value added of Poland's GDP in 1995-2020, indicators of Poland's trade-in 1995-2020 were assessed. The processes of the post-socialist transformation contributed to increasing the competitiveness of the Polish industry and reducing the gap between Poland and the European Union, increasing the ratio of exports to GDP in the context of a moderate current account deficit, hovering around 4% of GDP. Poland's economy grew at more than 4% per year, which, combined with a rising real exchange rate trend, resulted in a near doubling of GDP per capita in less than a decade. There are differences in GDP trends between the 1991-2000 modernization period (2001 was chosen as the turning point due to the GDP growth rate dropping to 1.26%) and the accession and post-accession period for Poland. In the period of modernization and EU integration, the industrial sector produced 33.5% in 1995, 28.6% in 2005, and 28.8% in 2010, and employment was 33.1% in 1995, 29.25% in 2005, and 30.3% in 2010.*

Keywords: *Regional Modernization; EU Countries; Integration; Qualitative Information; Economic Transformation; Market Relations.*

1. Introduction

The history of Poland's twentieth-century agrarian structure differs from most post-socialist countries because of the failure of collectivization after large-scale peasant resistance. In general, the fragmented agrarian structure survived communist rule. The sudden transformation of the Polish countryside began with the economic transition of 1989 This can be described as a process of rapid de-agrarianizing and continued urbanization, while traditionally agricultural areas became depopulated and adapted to another economic model. In the decades following the transformation - in the 1990s - the share of agriculture in Poland's GDP fell rapidly, from 7.2% in 1990 to 2.6% in 2016 (World Bank, 2016). To 2.6% in 2016 (World Bank, 2021). The introduction of the

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EU Common Agricultural Policy (CAP) in Poland improved farmers' incomes through direct payments. The introduction of the country's modernization programs contributed to economic growth and influenced further de-agrarianizing, especially in regions with a large role of agriculture in the rural economy. The article aims to quantify the regional aspects of modernization using the example and qualitative information of Poland's integration into the EU.

2. Literature review

Royo (2010) analyzes the modernization of the economies of Spain and Portugal in the context of EU integration, which was the catalyst for the ultimate transformation of the Iberian countries into modern Western-type economies. Indeed, one of the key consequences of their accession to Europe was that membership facilitated the modernization of the two economies (Gouldson & Murphy, 1996; Carayannis & Popescu, 2005; Eker, 2019), but not the only reason for this development. Economic liberalization, trade integration, and modernization of the economies of Spain and Portugal began in the 1950s and 1960s, both countries had been growing economically for two decades before EU membership, a development facilitated in part by The Preferential Trade Agreements (PTAs) between the EC and Spain (1970) and the EC and Portugal (1972). The agreements further opened European markets for EU countries, a path to a model of development and industrialization built on exports (Lyakh & Swain, 2019). The EU membership acted as a significant motivating factor to influence government and private sector decisions: increasing economic flexibility, restructuring industry, adopting VAT, and increasing trade liberalization. At the same time, the level of competition in the countries increased (Tiryakian 2011; Kaliber, 2014). Before EU accession, nominal tariffs in Portugal and Spain averaged 10-20%, EU production was cheaper and more competitive, membership led to increased imports from the EU and, consequently, the deterioration of the current account balance and the closure of Iberian industries. Spain and Portugal were attractive for the EU in terms of production because they provided access to a large market of labor (48 million people) with a high level of education, low wages, compared with EU standards. The transition period smoothed the losses of Portugal and Spain because of the treaty adjustment and EU funding, minimizing the costs for the sectors involved (industry).

In general, European integration and economic modernization provide the following results (Table 1).

Table 1. The economic transformation and modernization Source: Royo (2010).

European integration	Economic modernization
The end of economic isolation	Increasing competition
Institutional reforms	Industrial restructuring
Tax harmonization	Capital flow liberalization
The openness of the economies	Deregulation
Nominal convergence	Lower inflation
Capital infrastructure effort	Fiscal consolidation
Financial liberalization	Cohesion policies
Central Bank independence	Lower nominal interest rates
Privatization FDI	Internationalization
Labor market reform	Higher efficiency
Reduction in government subsidies	Deregulation
	Economic growth

The current literature on Europeanization and the school of modernization relies on a similar view of development and social change. In both cases, modernization is mainly a matter of technique and institutional adaptation, which is implemented in stages by importing Western institutions into the domestic structure. In this sense, modernization is understood as the liberalization and updating of national institutional settings and policies to achieve greater efficiency, transparency, responsibility, and accountability. Europeanization time is interpreted as a means of softening a rigid economic and political system and adapting it to the neoliberal rationale of EU norms, procedures, and institutions. Both the modernization school and the literature on Europeanization strongly envisage a struggle between tradition and modernity and the duality and in some cases even binary opposition, between domestic and imported.

3. Methodology

This study uses statistical analysis based on World Bank (2021) indicators to assess the modernization of the Polish economy during the period of transformation and accession to the EU. In particular, the change of socio-economic indicators of Poland's development in 1995-2020, indicators of the structure of Poland's economy in 1995-2020, the structure of the gross value added of Poland's GDP in 1995-2020, indicators of Poland's trade-in 1995-2020 were evaluated. Next, a regression analysis of GDP growth rates and Chow test to identify transformations in the economy.

The Chow test provides a check for equality of coefficients in regression models from two different periods and allows identifying the difference/similarity in the trends over different periods. The condition for the Chow test evaluation is the absence of heteroscedasticity (constancy of the variance of model residuals) error, whose presence affects the significance of regression coefficients for different periods (Toyoda, 1974). For small samples (as in our case), even insignificant heteroscedasticity (different variance of residuals) will significantly affect the test results (Toyoda, 1974). To avoid this, the use of logarithmic data eliminates variation in the variables over different periods.

In this paper, based on the Chow test, we estimate the equality of variance error for the data from different periods of Poland's economic growth (pre-accession and post-accession periods). Let us present the regression model as follows:

(1) $Y_1 = X_1\beta_1 + \varepsilon_1$

And the model in the second time period as:

(2) $Y_2 = X_2\beta_2 + \varepsilon_2$

In this research, the assumption is made that the number of coefficients in the regression k is less than in the time interval min (T1). The null hypothesis indicates equality of coefficients in the two regressions:

(3) $H_0: \beta_1 = \beta_2$

The Chow test is estimated based on the following equation:

(3) $F = \frac{[e'e-(e_1'e_1+e_2'e_2)]/k}{(e_1'e_1+e_2'e_2)/(T_1+T_2-2k)}$

The test shows that $\sigma_1^2 = \sigma_2^2$, F has an F distribution with k and (T – 2k) degrees of freedom where $T = T_1 + T_2$. The critical value of F statistics is estimated as:

(4) $\{F: F > F(k, T-2k; \alpha)\}$

where α denotes the level of significance of the test. However, if $\sigma_1^2 \neq \sigma_2^2$, we cannot be certain about the Chow criterion.

4. Results

The Republic of Poland today is an example of a country where effective economic and socio-political reforms have led to strong economic growth and political stability. Poland's accession to the EU in 2004 was decisive in the overall development of the country. According to sociological surveys, despite the economic problems felt by the EU during the global financial and economic crisis, the majority of the Polish population continues to consider this step as the most significant factor in the process of Poland's return to Europe. In particular, during the referendum on the RP membership in the EU, up to 77.4% of Poles voted for integration into the European Union, 22.5% - against it. Four years after joining the EU, during a poll conducted by TNS OBOP in February 2008, only 5% of Poles disapproved of the country's membership in the European Union. At the same time, positive effects of EU membership were declared by more than 80% of respondents, who were impressed by the rapid development of the Polish economy due to significant financial aid from the EU (both credits and investments) and the country's integration into Europe’s single market (table 2).

Table 2. Socio-economic indicators of Poland's development in 1995-2020

	1995	2005	2010	2015	2020
GDP growth (annual %)	7,10	3,51	3,74	4,24	-2,70
GDP per capita, PPP (constant 2017 international $)	12459,67	18937,48	23996,14	27797,06	32238,16
Unemployment, total (% of total labor force) (modeled ILO estimate)	13,70	17,75	9,64	7,50	3,55
Inflation, consumer prices (annual %)	27,95	2,18	2,58	-0,87	3,37
Labor force, total million	17,39	17,53	18,04	18,32	18,20
GDP (current billion US$)	142,29	306,14	479,83	477,81	594,16
Labor productivity (GDP/Labor force), current US per person employed	8,18	17,46	26,60	26,09	32,64

Source: World Bank (2021)

Poland's accession to the Schengen zone has been welcomed by the population and it allows Polish citizens to move freely, study, and find new jobs in the EU countries. And this, of course, has greatly improved the situation in the Polish labor market, and in general has affected the growth of the Polish state's role in the international arena.

Poland is the largest economy in Eastern Europe and the most populous country and is the first country to begin a program of fundamental market reforms under a non-communist government. On January 1, 1990, the government introduced a program of radical reforms developed by an economic group. The goal was to end the hyperinflation of Poland and to create the legal, institutional and economic basis for a market economy.

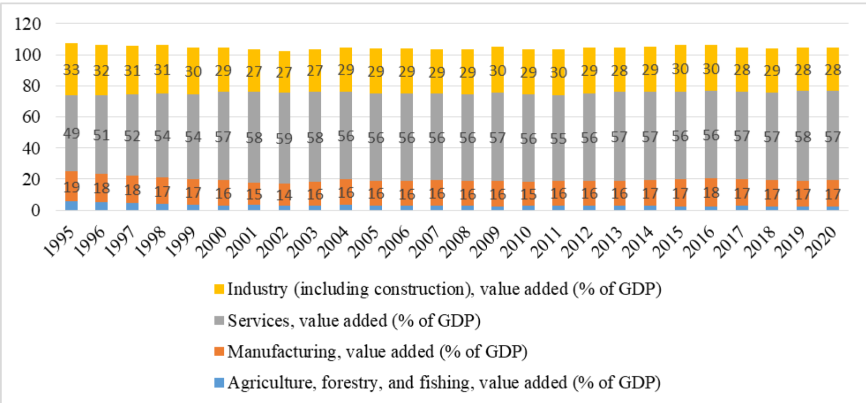
In Poland, in 1987 the industrial and construction sectors produced 52% of GDP, while in Greece, Portugal, and Spain 29-38%. In contrast, the growth of the services sector in Poland during the modernization of the economy was restrained through an orientation toward industry. In the same year, the service sector in Poland employed 35% of the labor force, much less than in Greece, Spain, or Portugal. But in the period of modernization and EU integration, the industrial sector produced 33.5% in 1995, 28.6% in 2005, and 28.8% in 2010, and employment was 33.1% in 1995, 29.25% in 2005, and 30.3% in 2010 (Table 3). Hyperinflation took place in Poland in the Autumn of 1989, during the change of power from the Communist to the Solidarity-led government. As in other Eastern European countries, the growth of Poland's economy in the 1950s and 1960s, industrial and agricultural production grew steadily and was based on large-scale investment in heavy industry and the absorption of labor from the rural sector. In the early 1970s, however, it became apparent that these sources of growth were being exhausted. In response, the government launched a modernization program based largely on imports of Western capital equipment and technology. According to official statistics, real investment grew at an average annual rate of nearly 11 % between 1970 and 1978.

Table 3. Dynamics of the Polish economic structure in 1995-2020

	1995	2005	2010	2015	2020
Employment in agriculture (% of total employment) (modeled ILO estimate)	22,880	17,380	13,050	11,530	9,385
Employment in industry (% of total employment) (modeled ILO estimate)	33,130	29,250	30,300	30,540	31,975
Employment in services (% of total employment) (modeled ILO estimate)	43,990	53,370	56,640	57,930	58,640
Agriculture, forestry, and fishing, value added (% of GDP)	5,578	2,919	2,858	2,375	2,390
Manufacturing, value added (% of GDP)	19,375	16,009	15,339	17,477	16,683
Services, value added (% of GDP)	49,146	56,322	56,270	56,223	57,461
Industry (including construction), value added (% of GDP)	33,482	28,637	28,858	30,127	28,165

Source: World Bank (2021).

As a result, industrial production during this period showed an average annual growth rate of 9%. Instead of restoring the foundations for sustained economic expansion, the modernization strategy led to a deep balance of payments crisis. Imports from the West in the 1970s were financed by loans from the West. As a result, the current account of the balance of payments declined sharply, reaching a peak of nearly 10 percent of GDP in 1975. Foreign debt, which had been negligible in 1970, exceeded $26 billion, or the equivalent of 40% of GDP, by the end of 1980 (figure 1)



Source: World Bank (2021).

Figure 1. The structure of gross value added to Polish GDP in 1995-2020, %

Poland's economy suffered significantly from the attempts to keep production from falling, which was only possible due to the increase in the production ratio (capital and energy intensity of industry). The stagnation of economic activity can be seen in the fact that Poland was unable to stimulate an intensive growth of exports to service its debts.

Poland's exports to the West increased by only 19% from 1978 to 1989, while the real value of world trade increased by about 60%, and the exports of Western European countries increased by 50%. Poland's reaction to its inability to export to the West during martial law was to reorient trade with the East. Although this reorientation provided partial relief from the constraints of import growth, the deepening of ties with the East only delayed and hindered the necessary modernization and restructuring of the economy.

The result of Poland's decline in production and trade was a failure to improve living standards (Table 4). According to official data, real per capita consumption in 1988 was only 4 percent higher than in 1978, compared with an increase of 21 percent in Western Europe. The statistics exaggerate Poland's growth. The official data do not record the lack of regulated goods or other forms of hidden inflation. Overall, it is clear that Poland has fallen further behind Western Europe during the decade. Quantifying the size of the gap with the West is difficult. The International Monetary Fund and the World Bank reported GDP per capita in 1988 at about $1,800, using official national income account statistics and converting at the official exchange rate. In 1990, the IMF uses informs GDP per capita of about $1,100. On this basis, Poland's standard of living is much closer to that of Latin America than in the lower-income countries of Southern Europe.

Table 4. Dynamics of trade indicators in Poland during 1995-2020

	1995	2005	2010	2015	2020
Trade balance	3,07	-4,00	-10,42	13,17	40,18
Exports of goods and services (% of GDP)	22,94	34,61	39,88	49,09	55,63
Imports of goods and services (% of GDP)	20,78	35,92	42,05	46,34	48,87
Trade (% of GDP)	43,72	70,53	81,93	95,43	104,50

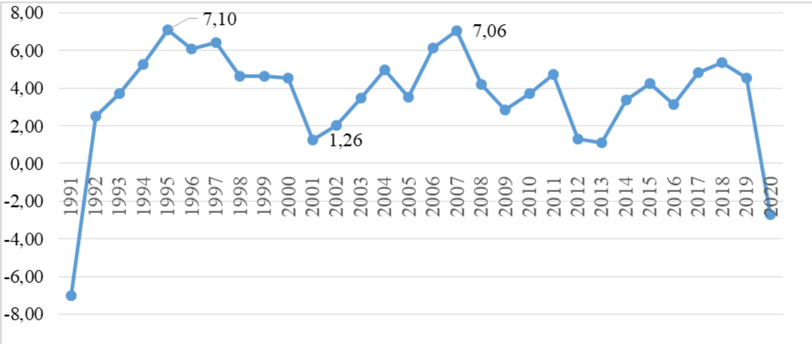
Source: World Bank (2021).

The inefficient structure of the Polish economy has harmed living standards: in the late 1980s the GDP per capita was less than $2,000, or about one-tenth of the level of Western Europe, but in 1995 it was $1,2459, in 2005 it was $18,937, in 2010 it was $2,396. In 2010, it was $2,396. In the 1980s, the foreign debt was almost 65% of GDP and constituted a serious burden for the economy, the beginning of the modernization process.

The first stage of transformation covers the period of "shock therapy" 1989-1991. The reform plan, which was prepared by a commission chaired by the Minister of Finance in cooperation with the International Monetary Fund (IMF), consisted of two bases: to stabilize the economy; and, with a longer horizon, to turn the centrally planned economic system into a market economy. The plan consisted of ten acts that promoted private property, integration with the world economy, independence of the central bank, and convertibility of the zloty. In the first years after the implementation of the Stabilization Plan, Poland suffered a profound redistribution of resources from the public to the private sector, both between and within sectors. As an example of the extent of this redistribution, during 1989-1991 the number of workers in large state-owned enterprises fell by more than 3 million, thereby reducing the share of employment in the public sector from about 75% to less than 50%. This was accompanied by a decline in production: GDP in 1991 was about 10% lower than in 1988. Another characteristic of this period was brief hyperinflation, triggered by the removal of subsidies and price liberalization. During 1989-1990, the annual consumer price index (CPI) inflation rate fluctuated well above 100%. In response, the National Bank of Poland (NBP) fixed the zloty exchange rate against the U.S. dollar to ensure the commitment to fight inflation. At the end of 1991. Inflation returned to the levels seen in 1988, that is, about 60%, and tended to decline. However, a side effect of the zloty fixation was the deterioration of the external competitiveness of the Polish economy, among other things, reflected in a decrease in the ratio of exports to GDP. For this reason, the zloty was devalued in May 1991, and a few months later a crawling peg system was introduced to stabilize the real effective exchange rate (REER).

Figure 2 shows the evolution of the annual GDP growth rate from 1991 to 2020 to assess the changes in economic growth trends during the period of modernization. During the second phase of the transformation between 1992 and 1995, the economy was further stabilized, with a GDP growth rate of 7.1 % in 1995.

On September 19, 1989, Warsaw (Poland) signs an agreement on trade and economic cooperation with the European Community. May 25, 1990, Poland submits a formal application for the opening of negotiations on an Association Agreement with the European Community. December 16, 1991, Brussels Poland signs the European Agreement, becoming a country associated with the European Community.



Source: World Bank (2021).

Figure 2. GDP growth in Poland (annual) %

On 20 October 1992, the President of the Republic of Poland ratifies the European Agreement, which entered into force in February 1994. On January 28/May 22, 1997, the Council of Ministers/Parliament adopted the National Strategy for Integration - a document systematizing the tasks to be accomplished in the period before EU membership. On December 12-13, 2002, The European Council endorses the results of the accession negotiations with the 10 candidate countries, including Poland. On April 16, 2003, the Accession Treaty was formally signed by the representatives of the 25 countries, 15 EU member states, and 10 candidate countries. On June 7-8, 2003 in a national referendum 77,45% of Poles vote for Poland's accession to the EU. On May 1, 2004, Poland becomes a member of the EU.

Inflation is brought down to about 20%. The foreign debt was greatly reduced as a result of the agreements with the Paris Club (April 1991) and the London Club (October 1994). This period was also important in the context of the EU integration process. In June 1993 at the Copenhagen summit, the European Council decided that associated countries from Central and Eastern Europe could become members of the EU, provided certain political and monetary criteria were met. In April 1994. Poland's foreign minister handed Poland's application for EU membership to a representative of the Greek head. Meanwhile, in February 1994, Poland applied for membership in the Organization for Economic Cooperation and Development (OECD). Regarding monetary policy, the crawling peg system was constantly adjusted to achieve a compromise between the anti-inflationary policy and the strengthening of external competitiveness. In July 1995 for the reduction of the external debt, Poland introduced the external convertibility of the zloty for the obligations stipulated by the articles of the IMF agreement (article VIII). This allowed Poland to regain access to foreign capital markets and foreign capital began to flow into Poland. This opened the third stage of transformation, which lasted until the accession to the EU in 2004.

The post-socialist transformation processes helped to increase the competitiveness of the Polish industry and narrow the gap between Poland and the European Union (Domański, 2003). During the third transformation period (1996-2004) Poland became a middle-income country, fully integrated into the world economy. Agreements with foreign debtors, capital account liberalization, and accession to the OECD provided an inflow of capital in the form of portfolio capital and FDI. The growth of FDI caused an inflow of modern technology, which contributed to the modernization of the Polish economy.

This was reflected in a significant increase in the ratio of exports to GDP in the context of a moderate current account deficit, hovering around 4% of GDP. Under these favorable economic conditions, the economy grew at an annual rate of more than 4%, which, combined with the trend of the real exchange rate, led to an almost doubling of GDP per capita in less than a decade.

As the results of this study show, there are differences in GDP trends between the 1991-2000 modernization period (2001 was chosen as a turning point due to the decline in GDP growth rate to 1.26%) and the accession and post-accession period in Poland (Table 5).

Table 5. Results of the regression analysis of GDP dependence on the period of time (before and after the EU membership)

Regression statistics	1991-2020	1991-2000	2001-2020
Multiple R	0,0104	0,5744	0,1505
R-squared	0,0001	0,3300	0,0226
Normalized R-Square	-0,0356	0,2462	-0,0316
Standard error	2,8924	3,4988	2,1775
Observations	30	10	20
F	0,0030	3,9401	0,4171
F Significance	0,9565	0,0824	0,5265

Source: World Bank (2021).

The results of the dispersion analysis (Table 6) point to differences in GDP growth rates between 1991-2000 and 2001-2020.

Table 6. Results of dispersion analysis and calculation of the Chow test

Analysis of variance	1991-2020		1991-2000		2001-2020	
	df	SS	df	SS	df	SS
Regression	1	0,025	1	48,232	1	1,978
Balance	28	234,251	8	97,932	18	85,348
Total	29	234,277	9	146,164	19	87,326
Amount SS	183,279					
Difference SS	50,972					
F fact	3,615					
F critical	3,369					

Source: World Bank (2021).

The critical (table) value of Fisher's criterion for confidence probability $\gamma = 0.95$ and number of degrees of freedom $v1 = k = 2$ and $v2 = n - 2 \cdot k = 30 - 2 \cdot 2 = 26$: F critical =

$F_{0.05; 2; 26} = 3.369$. Since F fact>F critical - the equation Y1 (1991-2000) and Y2 (2001-2020) do not describe the same trend, and the differences in numerous estimates of their parameters a1 and a2 as well as b1 and b2 are statistically significant. Consequently, it can be argued that there is a gap in the dynamics of Poland's GDP before 2000 and after 2000 (during the period after 2001).

5. Discussion

In the early 2000s, Poland continued to grow in building and strengthening its official political and economic institutions. As a result of accession to the European Union in 2004, the country was granted access to large markets in Western Europe (Puffer et al., 2016), which required the restructuring of key economic institutions and economic policies in line with the EU. However, like the United Kingdom and some other countries, Poland retained the national currency. Jerzy Buzek became President of the European Parliament, which further strengthened Poland's presence and commitment to strong, formal institutions. Regional governments have introduced direct elections of mayors and city presidents, and the legal system has been consistently improved in line with accepted international standards. Economic progress continued in the 2000s, mainly due to the prudent fiscal and monetary policies of the Polish government, which led to further economic strengthening.

Despite severe public criticism for severe difficulties, the policy has been such that Poland has generally avoided the investment bubbles that affected most other countries during the 2008 global financial crisis. The central bank became more independent and proactive and introduced the devaluation of the zloty in 2008. As part of its growing influence, the Central Bank also began working with the European Central Bank, and at the same time, the country's banking system became more sophisticated and modeled on the EU around the time when many international financial institutions entered the country. The growing strength and stability of Poland's official political institutions have allowed others to develop, such as capital markets and commercial banks, which have given companies access to debt financing, while accounting systems have continued to improve towards international standards. As a result of the strengthening of its official institutions, there were fewer voids, and Poland became a notable exception to the fall of Europe: its GDP grew by 1.5 percent in 2009, while every other EU economy shrank.

Continued growth in 2010 with a GDP growth of 3.9% was accompanied by the growth of 3.8% in 2011, among the highest in the EU. In the second half of 2011, the increasingly active Central Bank again devalued the zloty by 15% against the euro, stimulating exports, as a result of which GDP increased by 15.3% compared to 2010. The central bank also expanded its cooperation with the European Central Bank and continued to assess when to join the euro area. The domestic banking system has begun to consolidate as financial institutions become more sophisticated. Further evidence of the success of the country's institution-building for more than two decades was the ability of Polish companies in 2013 to launch the largest number of IPOs in any European country. Also, by 2013, several Polish companies began to expand abroad after developing a scale over the past few years, gaining sufficient management knowledge and experience, for example, adopting Western risk management practices (Wieczorek-Kosmala, 2014), competing with Western transnational companies. Foreign direct investment was directed mainly to Europe, focusing on services and then on production (Gorynia et al., 2012). The country has a strong domestic market that encourages investors and entrepreneurs, who have often demonstrated an innovative approach that is less common in more well-known multinational corporations (Lowe and Glocowski, 2013). Recognizing Poland's impressive economic progress, the EU has pledged 229 billion euros in aid to Poland by 2022, an inflation-adjusted amount that will exceed the amount of Marshall Plan funds sent to European countries after World War II (Bartyzel and McQuaid, 2014)

6. Conclusion

The processes of post-socialist transformation helped to increase the competitiveness of Polish industry and reduce the gap between Poland and the European Union, increase the ratio of exports to GDP in a moderate current account deficit, which fluctuates around 4% of GDP. Poland's economy grew by more than 4% per year, which, combined with the upward trend in the real exchange rate, led to an almost doubling of GDP per capita in less than a decade. In the period of modernization of 1991-2000 (2001 was chosen as a turning point due to the reduction of GDP growth to 1.26%) and the period of accession and after the accession of Poland, there are differences in GDP trends. During the period of modernization and integration into the EU, the industrial sector produced 33.5% in 1995, 28.6% in 2005 and 28.8% in 2010, and employment was 33.1% in 1995, 29.25% in 2005, and 30.3% in 2010.

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