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POLAND

COMPETITIVENESS REPORT 2013

National and Regional Dimensions

WORLD ECONOMY RESEARCH INSTITUTE
WARSAW SCHOOL OF ECONOMICS
WARSAW 2013

This book is a result of statutory research of the Collegium of the Word Economy. The research was conducted by the World Economy Research Institute and financed with funds provided by the Ministry of Science and Higher Education.

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First edition

ISSN 2083-229X
ISBN 978-83-7378-820-6

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Aktualizacja okładki
Studio Graficzne AGAT Jerzy Burski

DTP
DM Quadro

Print and binding
QUICK-DRUK s.c.
tel. 42 639 52 92
e-mail: quick@druk.pdi.pl

Order 100/V/13

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analysis carried out in this section of the report shows that the concentration of factors of production (in particular, human capital and funds, both public and private) in competitive clusters makes it possible to strengthen their competitive advantages and further deepen regional specialization. Clusters can thus serve as growth poles. The dynamic growth in the number of cluster initiatives in Poland shows that there is a great interest in this model of doing business, though most of them are still at the formative stage of development. Consequently, particularly important are economic policy measures aimed at supporting clusters in Poland, including efforts to overcome the reluctance of business partners to work together and a low level of trust between businesses, which is one of the biggest barriers to the development of clusters.

5.2. Foreign Trade Performance of Polish Regions

Adam A. Ambroziak

Foreign trade at the regional level depends on the overall level of regional development, the degree of its internationalization and competitiveness, understood as an ability to compete on international markets. The purpose of this study is to either prove or invalidate a hypothesis that foreign trade perpetuates existing differences in the development of Poland's regions, and that state intervention carried out without a coherent approach adds to regional disparities.

Investment projects carried out by companies are one of the driving factors behind a country's economic development. This is particularly noticeable at the regional level. Such projects lead to an influx of new technology, facilitate the appropriate use of the local labor market, and promote ties with suppliers and customers. Experts studying foreign trade conducted by Poland's regions point out that the structure of a region's exports should be consistent with demand on key export markets targeted by the region's businesses; this helps build regional export opportunities and stimulates their future development (Gawlikowska-Hueckel, Umiński, 2005, p. 15). A key issue, therefore, is the location of businesses in regions resulting in the sale of goods and services both domestically and abroad. International integration, including foreign trade carried out at the state level, has a significant impact on the development of the regions where the exporting businesses are based.

When it comes to the location theory and the geographic location of economic activity, A. Weber argues that the main factors determining the location of businesses are transport and labor costs (Friedrich, 1929, p. 124). According to Weber, industry is oriented toward raw materials if, in the course of processing, the raw material loses much of its weight or if the cost of transporting the raw material is higher than the cost of transporting the finished product. The main criticism of this concept is that it substantially simplifies things, primarily by disregarding the role of demand. A. Lösch is considered to be a pioneer of research into how the size of the market is important for the concentration of production; he expanded Weber's original theory to include a focus on demand. Lösch argued that industrial production is concentrated where there is a large market, which leads to a concentration of industry. In a large market, it is possible to generate large-scale sales revenue without creating a monopoly, according to Lösch. This guarantees intense competition, ensures good access to the market and leads to a reduction in company operating costs (Lösch, 1961, pp. 80–85; Zielińska-Głębocka, 2008, pp. 17–18). G. Myrdal has come up with a different approach to explain the location decisions of businesses: he argues that a concentration of industry in specific regions largely depends on the geographical and economic conditions created there (Myrdal, 1958, pp. 48–49). According to A. Marshall, the location of industry is mainly determined by important external benefits, especially those related to the geographic concentration of industry (Marshall, 1962, p. 221). In the context of concentration of economic activity, E.M. Hoover points out that manufacturers find it worthwhile to locate their businesses as closely as possible to their suppliers and markets in order to reduce transportation costs (Hoover, 1962, pp. 124–125).

All these theories clearly highlight the role of business location factors. Due to the uneven distribution of resources, coupled with the absence of corrective intervention action by the government, these factors result in regional differences. Government intervention leads to a change in the market conditions in which businesses function through an improvement in the attractiveness of regions that were previously less appealing to potential investors. The result is that businesses target specific locations, but these areas are often unprepared for such investment projects, in terms of either manpower or technology and telecommunication and transportation infrastructure. Sometimes government intervention may even deepen regional disparities. This is exemplified by what happens in special economic zones in Poland; their operations are often organized on the basis of suggestions from potential investors, not necessarily in line with the government's regional policy (Ambroziak, 2009).

Foreign trade can also contribute to an increase in regional differences. In the case of well-developed regions, foreign trade can enhance their attractiveness and competitiveness. On the other hand, weaker regions that are not attractive to businesses and are not among their potential investment destinations benefit less often from opportunities offered by foreign trade, thereby widening their gap with wealthier regions.

To conduct this analysis of foreign trade at the regional level, we used data on foreign trade and the socioeconomic situation of Poland's 16 provinces since the country's entry to the European Union. The data covers the 2004–2011 period and comes from the Customs Administration in Warsaw[2] and the Central Statistical Office (GUS).

2 The data on trade in goods is based exclusively on information from the so-called SAD documents and the INTRASTAT declarations. These are the actual data without rounding in the case of businesses ex-

We also used Economy Ministry data on investment projects carried out in Poland's special economic zones as of the end of 2011. It seems that the eight-year period since Poland's EU entry is long enough for a preliminary analysis of the trade profile of the country's regions.

Regional imports

While analyzing the data on imports by companies located in each province, it is necessary to keep in mind that, first, these statistics are understated in relation to the data published by the GUS for Poland as a whole, and second, that they reflect the actual inflow of and demand for imported goods in specific regions only to a small extent. Rather, they point to the location of companies engaged in imports, which means that first of all they reflect the geographic distribution of key importers in Poland.

While keeping these reservations in mind, the data show that Poland's imports have grown significantly (Figure 1). This trend, however, was neither as stable nor as strong as in the case of exports. The average annual growth rate for the imports of Polish regions during the studied period increased by around 9%, although in 2009 imports were 8 percentage points lower than in 2008. In 2009, all of Poland's provinces except for Dolnośląskie recorded a strong decline in the value of imports, compared with the previous year.

The period after the economic crisis showed a strong development of trade. The value of imports started to increase dynamically, by 16%–17% on average compared with the previous year. In 2010–2011, fast import growth was recorded in individual provinces (in Kujawsko-Pomorskie, imports increased by 57% in 2010 over 2009; in Lubuskie they grew by 44%; in Podkarpackie, Opolskie, and Warmińsko-Mazurskie by 30%, in Podlaskie by29%, and in Dolnośląskie by 28%).

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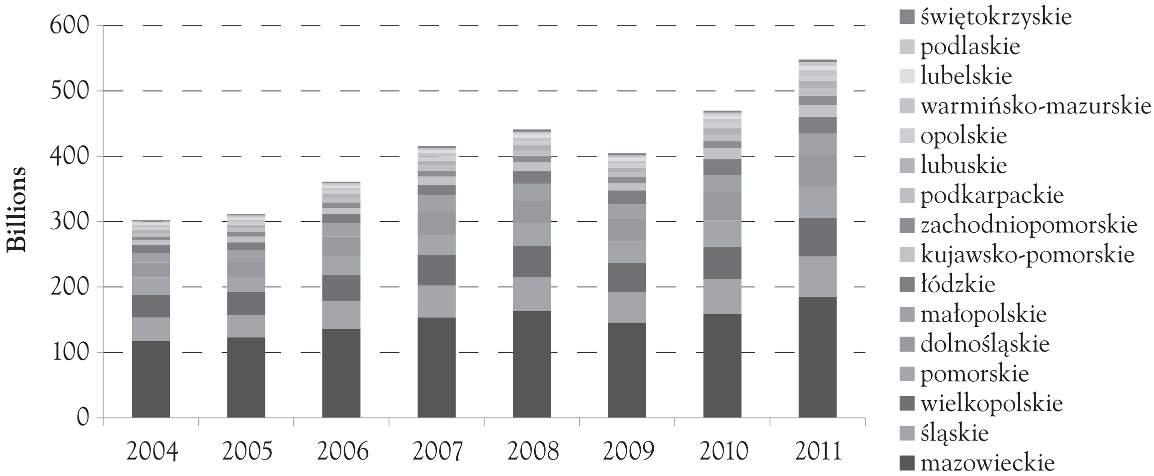
empt from the reporting obligation within the required time frame. Due to limited requirements for businesses to submit registered data, it is impossible to compile a full list of businesses engaged in foreign trade broken down by region. As a result, the available data are incomplete, and the trade of businesses not assigned to any region is around 10% for each year. This is due to several reasons.

First, the available foreign trade statistics are composed of two separate systems: INTRASTAT – system of statistics of trade with EU countries, and EXTRASTAT – system of statistics of trade with third countries. These systems, in addition to the fact that they cover various categories of foreign trade statistics, rely on different data sources. In order to reduce the burden of statistical obligations for businesses operating on the internal market and required to file declarations, a system of statistical thresholds has been developed defining the levels of annual sales above which declarations must be submitted. The introduction of this threshold has resulted in a reduction in the number of businesses required to submit declarations to around 12% of all businesses, and their trade in goods in terms of value accounts for about 98% of the total trade in goods with EU countries.

Second, a significant portion of the trade in goods is handled by foreign companies that only have fiscal representatives in Poland. These companies are only assigned a general Tax Identification Number (NIP) in Poland, and, consequently, their activity cannot be broken down by regions. Third, a separate issue is the confidentiality of data on foreign trade; businesses can apply to keep their sales data confidential. As a result, there is no possibility of identifying them and thus of assigning them to a specific region.

Figure 1
Imports by region, 2004–2011 (in billions of zlotys)



Source: Own elaboration based on data from the Customs Administration (*Izba Celna*) in Warsaw.

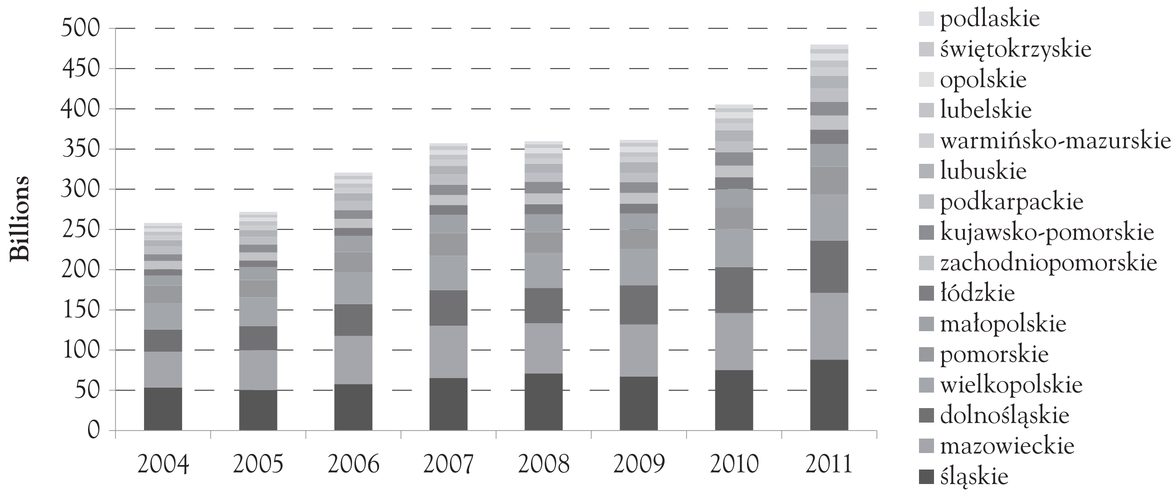
Regional exports

The data on exports, as opposed to imports, should be subject to a smaller margin of error when it comes to the share of individual regions in trade (admittedly, there is still the problem of incomplete data and their lower value compared with the GUS statistics). In this case, most businesses dealing with the manufacture of specific products look for export markets on their own, thus becoming not only producers, but also exporters. In this way, they reduce indirect costs and more quickly identify the expectations of markets to which they can adapt more efficiently.

A look at Poland's exports in the 2004–2011 period reveals a steady increase (Figure 2). The value of goods exported from Poland increased by between 12% and 18% annually on average during the studied period, except in 2008 and 2009, when the value of Polish sales abroad remained practically unchanged. This means that at the time of the economic crisis, when most countries worldwide were experiencing problems and struggled with limited domestic demand, Poland's regions maintained their overall exports at their 2007 level in terms of value.

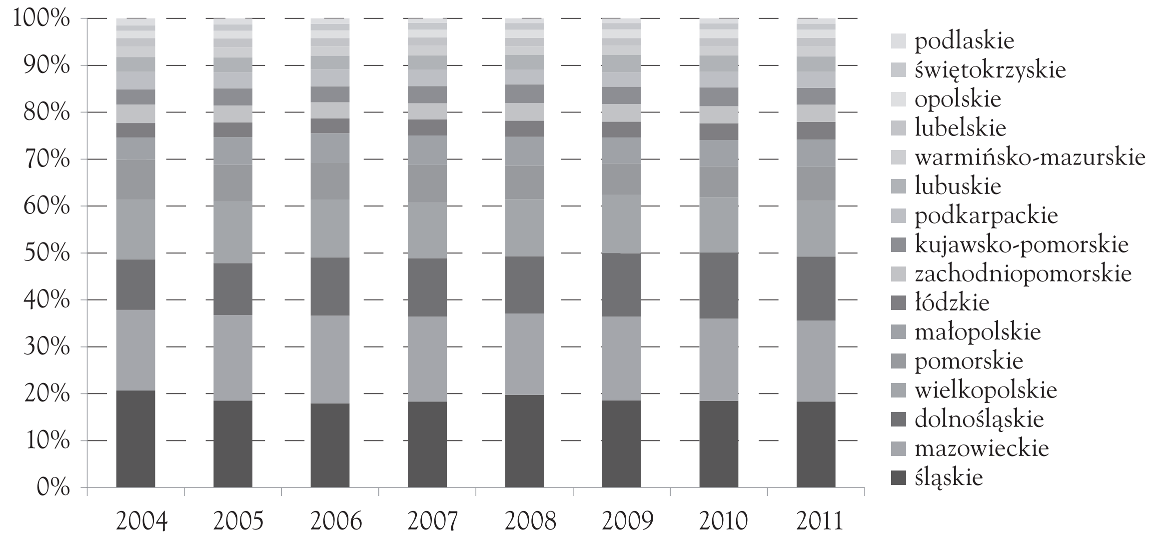
The fastest export growth in year-on-year terms on average was noted in the following provinces: Dolnośląskie, Łódzkie and Małopolskie (each 13%), Opolskie (12%), Kujawsko-Pomorskie (11%) and Lubuskie, Mazowieckie, and Świętokrzyskie (each 10%). Podlaskie fared the worst in this comparison, with an average annual export growth of 6%. However, it is worth noting that during the economic crisis of 2009–2011, exports grew the fastest in Łódzkie and Małopolskie as well as in regions that were previously relatively poor performers in this area. In provinces such as Lubelskie, Podkarpackie, Podlaskie, Pomorskie, and Warmińsko-Mazurskie, foreign sales in selected years were in fact lower than in previous years. This could mean that the break in the overall export growth in these regions during the economic crisis enabled them to develop areas of expertise whose importance in Poland's overall exports is growing.

Figure 2
The volume of exports by province, 2004–2011 (in billions of zlotys)



Source: As in Figure 1.

Figure 3
The percentage share of individual provinces in Poland's total exports, 2004–2011



Source: As in Figure 1.

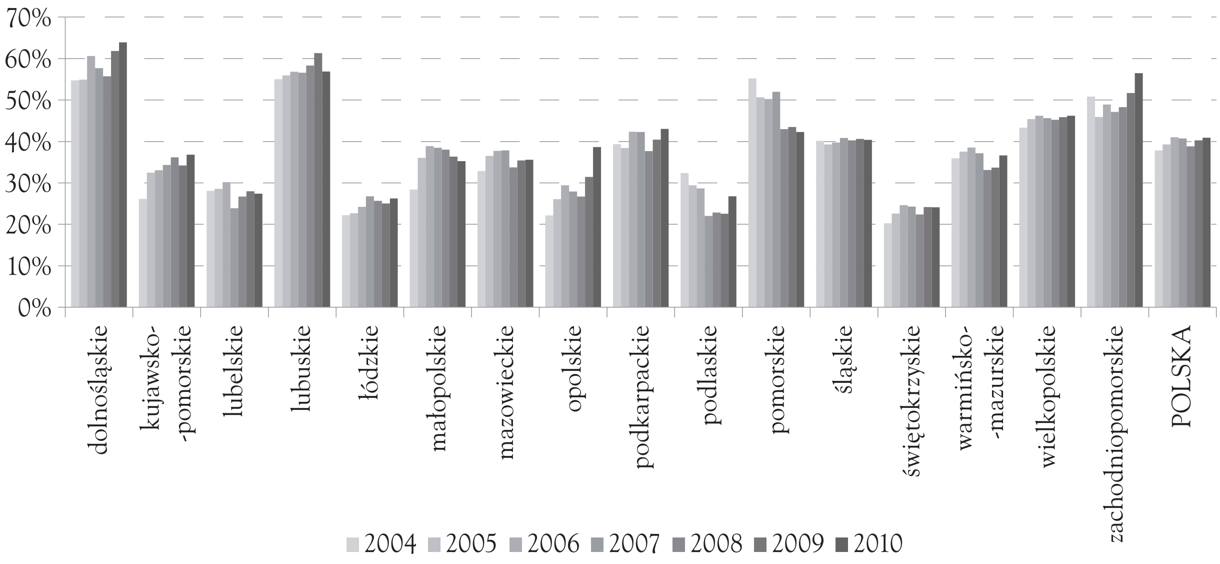
The structure of Poland's exports by province varies considerably. In 2004, Śląskie was the largest exporter in absolute terms; its sales abroad accounted for 20.7% of Poland's total exports, followed by Mazowieckie with 17.2%, Wielkopolskie with 12.7%, Dolnośląskie with 10.8%, and Pomorskie with 8.5% (Figure 3). Considering that in the

2004–2011 period the share of 14 provinces underwent no major change, Śląskie's contribution to Poland's total exports fell by 2.4 percentage points to 18.3% – in favor of Dolnośląskie, whose share increased by almost 3 percentage points to 13.6% in 2011.

In order to determine the degree of openness of a regional economy to foreign trade, we examined the relationship between the value of foreign sales in individual provinces to the total value of production sold in the 2004–2011 period. The proportion of exports in the total value of sold industrial production in all 16 provinces increased gradually over the studied period from 38.1% in 2004 to 41.1% in 2010 (Figure 4). The clear-cut leaders in this table in 2004 were: Lubuskie (56.1%), Pomorskie (55.5%), Dolnośląskie (54.8%), Zachodniopomorskie (50.8%), Wielkopolskie (43.1%), and Śląskie (40.2%). Over the years, the following provinces have significantly increased the percentage of exports in total sales: Dolnośląskie (to 63.9% in 2010), Zachodniopomorskie (to 56.5% in 2010), and Wielkopolskie (to 46.0% in 2010).

Figure 4

The value of exports as a percentage of the total value of production sold by Poland's provinces in 2004–2010



Note: No data available for 2011 in the GUS Regional Database (as of Jan. 31, 2013).

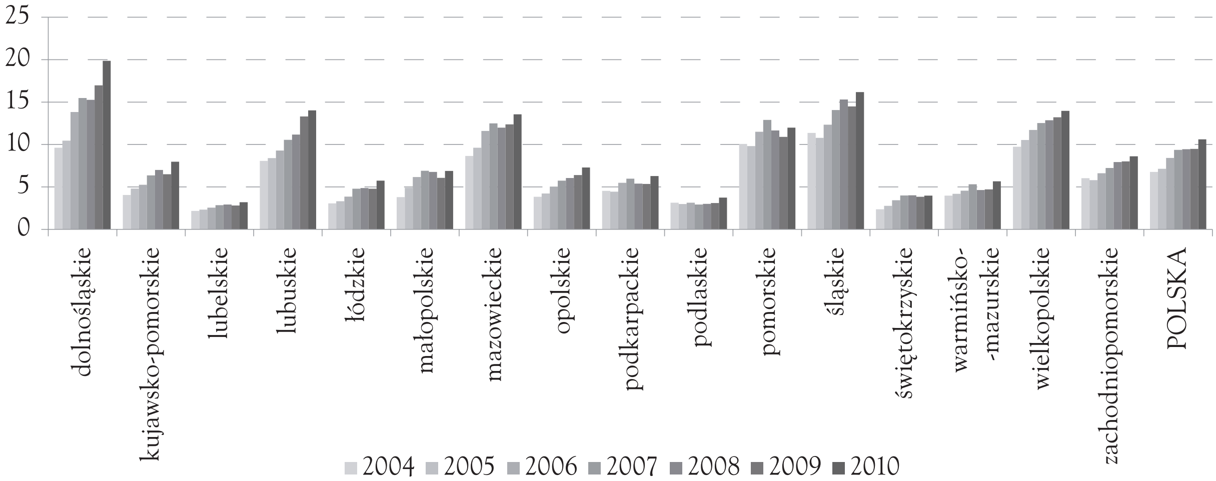
Source: As in Figure 1.

Provinces such as Świętokrzyskie, Opolskie, Łódzkie, Lubelskie, and Kujawsko-Pomorskie do not take full advantage of their export opportunities. In these provinces, the relationship between the value of exports and the total value of production sold remained at a low level in 2004–2010, well below the national average. A significant decrease in the importance of exports as a factor stimulating production was recorded in Poland in 2008, the first year of the economic crisis, primarily due to a major decrease in this indicator in Pomorskie (from 52.3% in 2007 to 43.4% in 2008) as well as in Mazowieckie (from 37.9% to 33.8%), Podkarpackie (from 42.6% to 38.0%), and Warmińsko-Mazurskie (from 36.8% to 33.0%). In the case of these regions, this indicator confirmed their stronger dependence on domestic demand than on foreign demand for goods.

The trends discussed above are confirmed by an analysis of the relationship between the value of exports and the population of each province (Figure 5).

Figure 5

The value of exports by provinces per capita in 2004–2010 (thousands of zlotys)



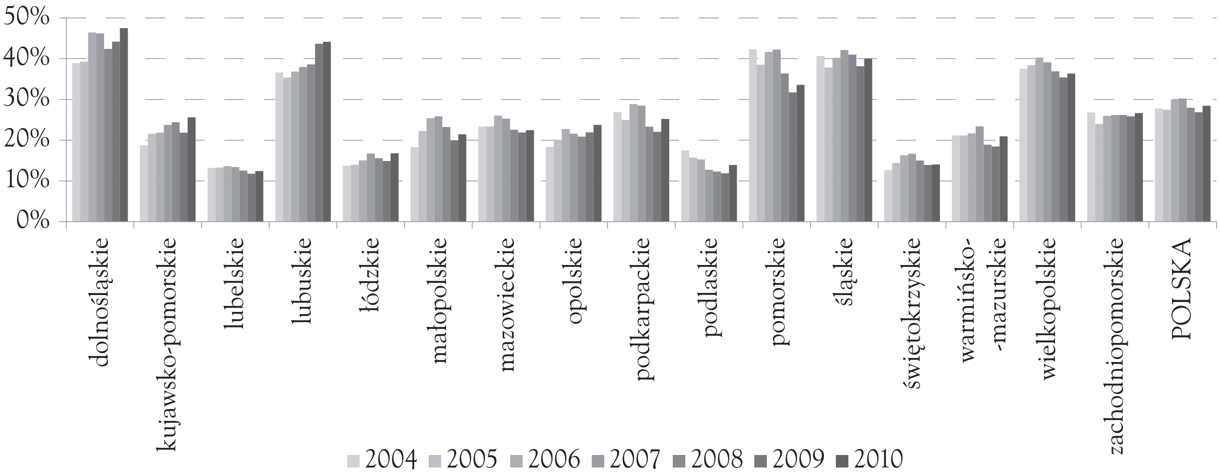
Note: No data available for 2011 in the GUS Regional Database (as of Jan. 31, 2013).

Source: As in Figure 1.

Some interesting conclusions can be reached by analyzing the value of exported goods in terms of their GDP share. This indicator determines the role of exports in each region in Poland (Małopolskie Obserwatorium Gospodarki, 2011, p. 15). In 2004–2010, the average share of exports in Poland's GDP was around 30% (Figure 6). This means that the Polish economy as a whole is to a relatively large extent dependent on foreign sales. The most international-oriented provinces in terms of the relationship between the value of exports and the GDP at the beginning of the studied period (i.e. in 2004) were Pomorskie (42.5%), Śląskie (41.7%), Dolnośląskie (39.0%), and Wielkopolskie and Lubuskie (each 37.4%). On the other hand, the regions least oriented toward foreign sales were: Świętokrzyskie (12.7%), Lubelskie (13.0%), Łódzkie (13.8%), and Podlaskie (17.4%). This classification remained essentially unchanged throughout the analyzed period, though in some cases, the level of internationalization through exports has increased. This chiefly applies to Dolnośląskie, which in 2010 generated exports with a value equal to almost half of its GDP (47.5%), and another case in point is Lubuskie (44.8%).

Among the provinces which significantly increased their exports in relation to GDP during the studied period were also Kujawsko-Pomorskie (a rise from 18.8% to 25.6%) and Opolskie (from 18.4% to 24.6%). A decline in the exports-to-GDP ratio, on the other hand, was recorded in the case of Pomorskie (from 42.5% to 33.7%), which is still among the frontrunners, though with steadily deteriorating results, as well as in the case of Lubelskie (from 13.0% to 12.8%), Mazowieckie (from 23.4% to 22.5%), and Podlaskie (from 17.4% to 13.9%).

Figure 6
Value of exports in provinces in relation to GDP in 2004–2010 (%)



Note: No data available for 2011 in the GUS Regional Database (as of Jan. 31, 2013).

Source: As in Figure 1.

The balance of trade by province

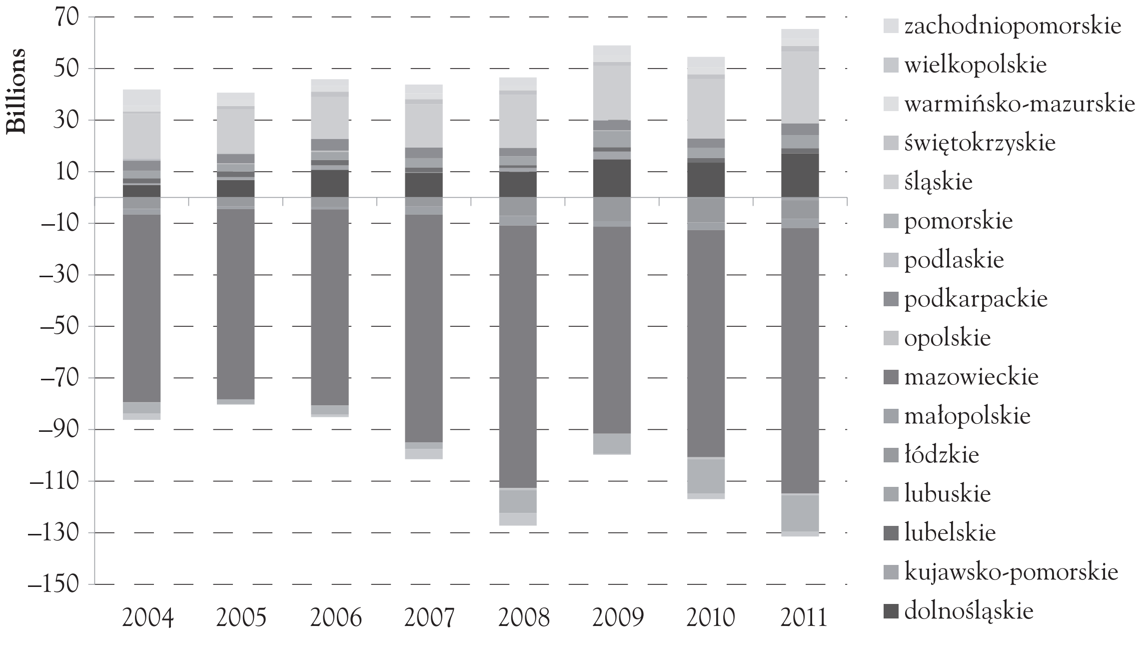
Given the volume of exports and imports in individual provinces, and keeping in mind the limitations of the data, which exclusively indicates the location of the companies involved in foreign trade, it is possible to assess the role of individual provinces in Poland's foreign trade balance (Figure 7).

Throughout the studied period, the trade of individual provinces had a varied impact on Poland's overall trade balance. In the early years, a surplus of imports over exports was recorded in Śląskie (ZL17.4 billion), Zachodniopomorskie (ZL6.4 billion), Dolnośląskie (ZL 4.8 billion), and Podkarpackie (ZL4.0 billion). The largest deficits were recorded in Mazowieckie (ZL72.9 billion) and Łódzkie (ZL4 billion). In the following years, until 2011, the trade deficit of several regions increased significantly: Mazowieckie's trade deficit rose to ZL103.0 billion, Pomorskie's to ZL14.2 billion, Łódzkie's to ZL7.3 billion, and Małopolskie's to ZL3.5 billion.

The above analysis does not mean that imports by the aforementioned regions were consumed only in these regions. These provinces, and especially the major urban centers they include, are particularly attractive to businesses involved in imports. Taking into account the development of roads in Poland and the possibility of reaching consumers nationwide, an optimal location for a company importing goods from abroad is Łódzkie, which is located in the middle of the country and has freeway infrastructure that is undergoing further expansion. The Wielkopolskie, Małopolskie and Opolskie regions are relatively close to Poland's borders with other EU member states, which facilitates imports, in particular those from EU markets. The significant increase in imports to Pomorskie province is due to increased use of the seaports of Gdynia and Gdańsk by local importers. The high foreign trade deficit of Mazowieckie is in part due to a large number of companies from the trade services sector registered in the capital, which benefit from a well-developed and efficient network of administration and financial and business services. However, businesses importing goods as well as those active in the storage and distribution of goods imported from abroad often use warehouses located in less expensive regions. It should also be noted that the group of provinces recording a surplus of imports over exports has been joined by Kujawsko-Pomorskie (ZL1 billion in 2011) and Podlaskie (ZL400 million). In these two cases, the growth in imports has evidently been determined by the poor production performance of these regions, problems with finding employment, and the fact that many people have been forced to look for new jobs and often set up their own companies that focused on imports.

Figure 7

The balance of trade by province in 2004–2011 (in billions of zlotys)



Source: As in Figure 1.

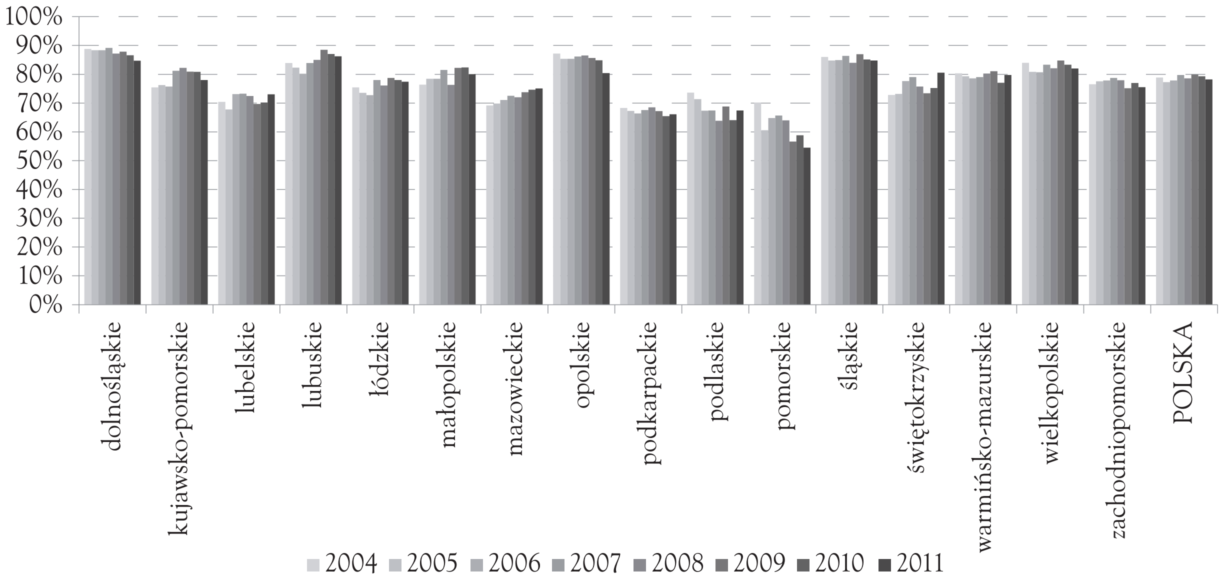
During the studied period, Dolnośląskie reported a relatively high increase in its positive foreign trade balance in 2011, compared with 2004, from ZL4.8 billion to ZL17.1 billion. Śląskie improved from ZL17.4 billion to ZL27.7 billion, and Lubuskie from ZL2.8 billion to ZL5.1 billion. These regions are where companies manufacturing goods with a relatively high value and targeting mainly export markets are located, which leads to an increased surplus of exports over imports.

The geographical structure of exports by province

Poland's integration with the European Union began with the entry into force of the commercial part of the Europe Agreement, which led to creation of a free trade zone for manufactured goods at the end of 2001. Poland's EU entry required some additional adjustments in technical requirements, which slightly changed the terms of trade in such goods. As far as agri-food products are concerned, a partial and selective liberalization process took place while Poland was an associate member of the EU, and once the country joined the bloc, EU markets fully opened to these products. The advanced process of trade liberalization meant that the EU was Poland's main trading partner from the mid-1990s onward, with a 78%–80% share in the total value of Poland's foreign trade. Similar trends were noted at the regional level. For each province, the EU was the main external buyer of goods (Figure 8).

Figure 8

The share of the EU in the total exports of Poland's provinces, 2004–2011 (%)



Source: As in Figure 1.

Shortly after Poland entered the EU, the highest share of the EU in total goods exports was noted in Dolnośląskie (89%), Śląskie (86%), and Lubuskie and Wielkopolskie (each 84%). The lowest level of sales to the EU, though also relatively high, was in Podkarpackie (68%), Mazowieckie (69%), and Lubelskie and Pomorskie (each 70%). Due to the economic crisis in the European Union, the rate at which sales on the EU internal market grew decreased slightly, but the EU's share in Polish province exports remained at more or less the same level, with the exception of Pomorskie (where a decrease from 66% in 2007 to 57% was noted in 2009) and Świętokrzyskie (from 79% to 73%). In subsequent years, in nine provinces sales to the EU were lower in relation to overall exports. Notably, in the case of Pomorskie, the EU's share in total exports fell to 55% in 2011 largely due to the province's specific mix of goods exported and the fact that its main customers are based outside the European Union.

In terms of the country as a whole, the geographic structure of the provinces' foreign trade is not very diversified. Poland, as a member of the EU, is strengthening its economic ties with other countries in the bloc, through specialization in both inter- and intra-industry trade. However, the dependence of the country as a whole on what happens on its main export markets may not be the best option, especially given the troubled situation and the economic and financial problems in the eurozone. Consequently, finding more non-European export markets should increase the security of industry in Poland's provinces.

In order to more precisely determine the level of Polish provinces' ties with the European Union, we calculated the so-called revealed comparative advantage indices.[3] For this purpose, we examined the relation between a region's share in Poland's exports to other EU countries and the region's share in Poland's overall exports (Table 4). An analysis of the data on the revealed comparative advantage shows a correlation between the location of a region and the intensity of its export ties with Poland's closest and largest trading partners.

Table 4

The revealed comparative advantage of Poland's regions in exports to EU member states in relation to the regions' overall exports

	2004	2005	2006	2007	2008	2009	2010	2011
Dolnośląskie	1.13	1.14	1.13	1.12	1.11	1.10	1.09	1.08
Kujawsko-Pomorskie	0.96	0.99	0.97	1.02	1.05	1.01	1.02	1.00
Lubelskie	0.89	0.88	0.94	0.92	0.92	0.87	0.88	0.93
Lubuskie	1.06	1.06	1.03	1.05	1.08	1.11	1.10	1.10

3 The revealed comparative advantage index is the most widely used instrument to measure a country's competitive position in the international trade of goods. The concept of the revealed comparative advantage involves a search for product groups in exports where a country has a particularly strong position in comparison to its overall exports worldwide. The index has been used to estimate the position of Poland's provinces in trade with the EU by researchers including K. Gawlikowska-Heuckel and S. Umiński, *Handel Zagraniczny Małopolski 2008* (The Foreign Trade of Małopolska Province in 2008), Urząd Marszałkowski Województwa Małopolskiego, Kraków 2009. The revealed comparative advantage index for a specific region in exports to a given market compared with other regions, was calculated using the following formula: $RCA = \frac{Wk/W}{PLk/PL}$, where W$k$ is the value of exports from a given province to market k, W is the value of exports of a given region, PLk is the value of Poland's overall exports to market k, and PL is the value of Poland's total exports.

	2004	2005	2006	2007	2008	2009	2010	2011
Łódzkie	0.96	0.95	0.93	0.98	0.97	0.99	0.98	0.99
Małopolskie	0.97	1.02	1.01	1.02	0.97	1.03	1.04	1.02
Mazowieckie	0.88	0.90	0.91	0.91	0.92	0.92	0.94	0.96
Opolskie	1.11	1.10	1.10	1.08	1.10	1.07	1.07	1.03
Podkarpackie	0.87	0.87	0.85	0.85	0.87	0.84	0.83	0.85
Podlaskie	0.93	0.92	0.87	0.85	0.81	0.86	0.81	0.86
Pomorskie	0.89	0.78	0.83	0.82	0.81	0.71	0.74	0.70
Śląskie	1.09	1.10	1.09	1.08	1.07	1.09	1.07	1.08
Świętokrzyskie	0.92	0.95	1.00	0.99	0.96	0.92	0.95	1.03
Warmińsko-Mazurskie	1.02	1.03	1.01	0.99	1.02	1.01	0.97	1.02
Wielkopolskie	1.06	1.05	1.04	1.04	1.04	1.06	1.05	1.05
Zachodniopomorskie	0.97	1.00	1.00	0.99	0.99	0.94	0.97	0.97

Note:

	An index equal to or exceeding 1 means a comparative advantage in trade with the EU

Source: Own elaboration based on data from the Customs Administration (*Izba Celna*) in Warsaw.

Analyzed data for the 2004–2011 period show that the provinces most strongly oriented toward exports to EU member countries are Dolnośląskie, Kujawsko-Pomorskie, Lubuskie, Małopolskie, Śląskie, and Wielkopolskie. Not surprisingly, this means that the group of regions in which the EU has a strong share in overall province exports mainly included provinces in western Poland.

On the other hand, some provinces, especially those located in the eastern part of Poland, have much greater exports to the Commonwealth of Independent States (Table 5). These include Podlaskie, Podkarpackie, Lubelskie, Mazowieckie, Kujawsko-Pomorskie, Łódzkie, Świętokrzyskie and, intermittently, Małopolskie. It should be noted, however, that since Poland joined the EU, the revealed comparative advantage index in exports to CIS countries has gradually decreased for all of these regions. This means that the share of exports to countries beyond Poland's eastern border, though still significant, is falling in these regions, which is further proof of the strong pro-EU trend in the exports of Poland's regions.

The study also revealed a comparative advantage of two provinces, Pomorskie and Zachodniopomorskie, in exports to EFTA countries in relation to overall exports (Table 6). The indices for these two provinces are significant, compared with other provinces. This is mainly due to the specific features of the shipbuilding industry goods produced and offered by these two provinces.

Table 5

The revealed comparative advantage of Poland's regions in exports to the CIS in relation to the regions' overall exports

	2004	2005	2006	2007	2008	2009	2010	2011
Dolnośląskie	0.31	0.35	0.36	0.43	0.48	0.43	0.44	0.43
Kujawsko-Pomorskie	1.50	1.40	1.45	1.14	1.01	1.24	1.08	1.22
Lubelskie	2.11	1.95	1.78	1.70	1.81	2.61	2.22	1.76
Lubuskie	0.91	1.08	1.23	1.16	0.98	0.85	0.91	0.93
Łódzkie	1.85	1.75	1.69	1.47	1.51	1.69	1.67	1.59
Małopolskie	1.39	1.02	0.81	0.79	1.15	1.04	0.98	1.06
Mazowieckie	2.08	1.91	1.83	1.82	1.64	1.76	1.72	1.58
Opolskie	0.57	0.58	0.67	0.54	0.58	0.52	0.49	0.46
Podkarpackie	2.03	1.91	1.86	1.95	1.79	2.01	1.79	1.64
Podlaskie	2.47	2.67	2.91	2.74	2.91	3.41	3.63	2.94
Pomorskie	0.54	0.57	0.55	0.60	0.58	0.85	0.69	0.85
Śląskie	0.33	0.37	0.50	0.57	0.71	0.43	0.58	0.70
Świętokrzyskie	1.31	1.40	1.31	1.33	1.42	1.50	1.44	1.34
Warmińsko-Mazurskie	0.87	0.87	0.90	0.88	0.99	1.03	0.92	0.96
Wielkopolskie	0.66	0.74	0.76	0.82	0.81	0.71	0.80	0.79
Zachodniopomorskie	0.43	0.50	0.49	0.52	0.47	0.55	0.46	0.63

Note:

	An index equal to or exceeding 1 means a comparative advantage in trade with the CIS

Source: Own elaboration based on data from the Customs Administration (*Izba Celna*) in Warsaw.

Table 6

The revealed comparative advantage of Poland's regions in exports to EFTA countries in relation to the regions' overall exports

	2004	2005	2006	2007	2008	2009	2010	2011
Dolnośląskie	0.50	0.51	0.56	0.44	0.42	0.53	0.69	0.52
Kujawsko-Pomorskie	0.76	0.73	0.83	0.86	0.84	0.70	0.71	0.54
Lubelskie	0.31	0.32	0.31	0.35	0.35	0.37	0.37	0.28
Lubuskie	0.43	0.38	0.61	0.65	0.60	0.49	0.60	0.46
Łódzkie	0.61	0.63	0.66	0.78	1.23	0.70	0.66	0.46
Małopolskie	0.68	0.46	0.41	0.44	0.40	0.42	0.40	0.41
Mazowieckie	0.50	0.36	0.44	0.48	0.55	0.50	0.55	0.57

	2004	2005	2006	2007	2008	2009	2010	2011
Opolskie	0.59	0.61	0.68	0.74	0.66	0.60	0.42	0.33
Podkarpackie	0.35	0.38	0.42	0.58	0.62	0.59	0.53	0.36
Podlaskie	0.50	0.50	0.60	0.74	0.86	0.56	0.76	0.75
Pomorskie	4.87	5.83	5.22	5.10	5.11	5.71	4.95	6.45
Śląskie	0.41	0.38	0.41	0.40	0.56	0.42	0.52	0.37
Świętokrzyskie	0.95	0.83	0.65	0.55	0.75	0.53	0.74	0.81
Warmińsko-Mazurskie	1.21	0.94	0.91	0.82	0.84	0.84	1.04	0.64
Wielkopolskie	0.73	0.71	0.75	0.83	0.86	0.85	0.98	0.88
Zachodniopomorskie	2.67	2.75	3.24	2.96	2.18	3.18	2.80	1.55

Note:

	An index equal to or exceeding 1 means a comparative advantage in trade with EFTA countries

Source: Own elaboration based on data from the Customs Administration (*Izba Celna*) in Warsaw.

The findings confirm the conclusions of some previous reports on regional trade to the effect that "it is possible to see a general rule whereby mainly regions in western Poland have highly intensive ties with EU15 countries. This appears to confirm a hypothesis known from the theory of trade that regions 'tend toward' sales markets that are the closest to them". (Gawlikowska-Hueckel, Umiński, 2009, p. 64).

The commodity pattern of exports by province

While analyzing the commodity structure of exports of Poland's provinces, it is necessary to keep in mind that commercial intermediaries play a significant role among entities involved in foreign trade. This fact did not matter in the analysis of the overall exports of individual provinces. However, the following detailed analysis of exports by commodity groups will be limited to groups of goods offered in each category covered by the Polish Classification of Activities (PKD) along with directly related services, while excluding other services, among them retail and wholesale trade services.

An important gauge of the foreign trade performance of Poland's provinces and the country as a whole is the structure of products offered in exports. To analyze the commodity structure of exports, we used an OECD classification that makes it possible to determine the technological advancement of sectors involved in trade at the international level. This classification divides manufacturing industries according to the share of advanced technology in the production process, dividing sectors into high-, medium-high, medium-low and low-technology ones.

This analysis of the structure of exports of Polish regions makes it possible to evaluate their involvement in the exports of individual products, as well as their specialization in offering goods from high-, medium-high, medium-low and low-technology industries.

In order to determine the export profile of Polish regions, we calculated the revealed comparative advantage indices. The commodity pattern of exports is taken to reflect the differences in the relative costs of production as well as in non-cost factors and it is also assumed that this pattern reveals the advantages of specific exporters in sales abroad. A revealed comparative advantage (RCA) index greater than 1 means that the share of a given province in the exports of a particular group of products is larger than this sector's share in Poland's overall exports. This appears to testify to the comparative advantages of the region in exporting products from a given sector. The index measures the intensity of the export specialization of a given region in relation to Poland as a whole. When the index refers to countries from a given part of the world or the world as a whole, such an interpretation could not be entirely correct, because any changes in the indicator could result from not only varying productivity, but also from changes caused by an export stimulation policy. However, when it comes to the situation of provinces, the exports of all of them are treated in the same way if instruments for supporting sales abroad are applied at the national level.

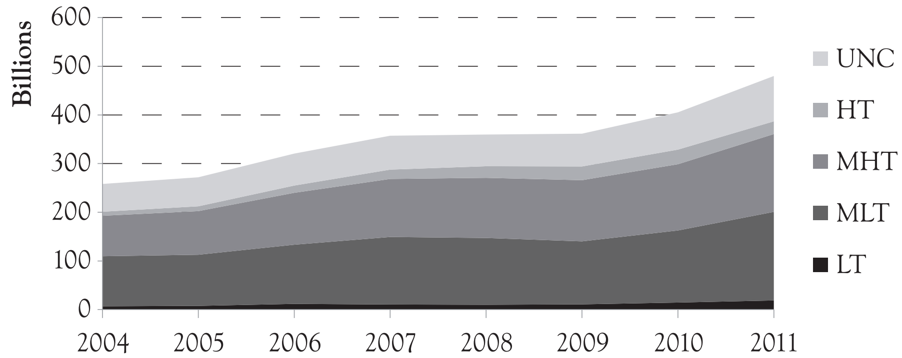
The revealed comparative advantage (RCA) index measures more than just the comparative advantage according to an approach developed by British political economist David Ricardo. A change in the relative proportion of exports may also be due to a change in the position of companies active in the sector; such a change can be achieved through an improved operating efficiency, cost optimization or the adoption of a better strategy. These factors are particularly important in sectors with a small number of competing firms (Posłuszny, Portal gospodarczy: finanse.wnp.pl; accessed Feb. 5, 2013). Another case in point are those Polish regions which are home to special economic zones (Ambroziak, 2009). Consequently, in addition to the RCA for the exports of specific industries in 2011,[4] we also examined the relative intensity of the cumulative investment of a specific sector in special economic zones in a given region for that same year. For this purpose, we established the relation between a given sector's share in total SEZ investment in a given region and this sector's share in total SEZ investment nationwide (Table 7).

Between 2004 and 2011 no radical qualitative change occurred in Poland's exports (Figures 9 and 10). While the export performance of some regions changed, others maintained their previous position. The main contributing factors are Poland's eight years of EU membership with all its consequences, such as functioning on the EU internal market and the use of a common commercial policy toward third countries, combined with the development of regions resulting from the allocation of European

[4] The revealed comparative advantage index of a given province in exporting goods and services from industry *i*, compared with the position of the remaining provinces in exporting goods and services from the same industry, was calculated according to the following formula: RCA , where W*i* is the value of goods and services exported from industry *i* in a given province, W is the value of exports of a given province, PL*i* is the value of exports of industry *i* across Poland, and PL is the value of Poland's exports.

funds. Other factors have included the symptoms of an economic crisis in Poland and changes in the attractiveness of individual regions to both domestic and foreign investors.

Figure 9
The structure of Poland's exports in the 2004–2011 period by level of technology (in billions of zlotys)



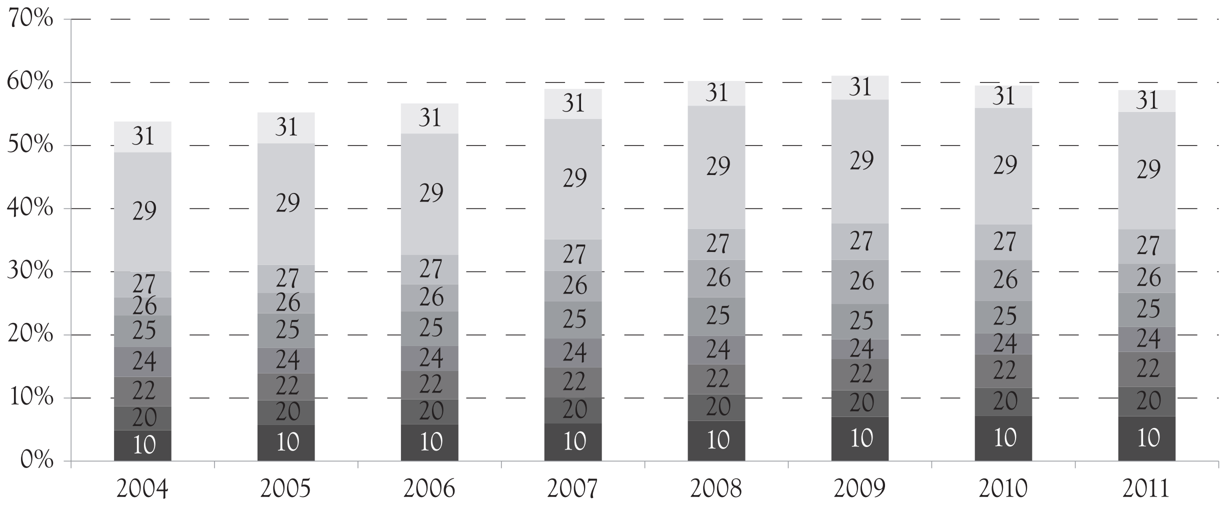
Note: LT – low-tech industries, MLT – medium-low-tech industries, MHT – medium-high-tech industries, HT – high-tech industries, UNC – unclassified.

Source: As in Figure 1 and Eurostat: Glossary: High-tech; High-technology aggregations based on SITC Rev. 4, http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:High-tech

The proportion of high-tech industry exports has increased steadily, from 4.1% in 2004 to 6.8% in 2011 (Figure 9). It should be stressed, however, that during the crisis, the figure reached 9.6% in 2009 and 9.1% in 2010. At the beginning of the period, among the provinces that led the way in the exportation of such products were Pomorskie (46.3% of total high-tech industry exports in 2004) and Mazowieckie (30% in 2004 and 48% in 2005–2006). In the following years, with an evident acceleration in regional development and new foreign investment projects, the role of these regions in the export of high-tech industry products decreased in favor of Dolnośląskie, Wielkopolskie, Małopolskie and Kujawsko-Pomorskie; the contribution of these provinces rose significantly. Dolnośląskie noted a 25-fold rise to 25% in 2011; Wielkopolskie reported a more than twofold rise to 12%; Małopolskie improved threefold to 10%; and Kujawsko-Pomorskie rose to 10% in 2010, followed by a fall to 5.2% in 2011 (Figure 11).

Among high-tech industry products, from the point of view of Poland as a whole, the most important were goods from the electronic, optical and computer industry, with a share ranging from 7.0% in 2009 to 4.6% in 2011. Almost all of these regions (with the exception of Wielkopolskie) had a relatively high revealed comparative advantage index in relation to other regions, as well as a relatively high intensity of SEZ investment in the sector. This demonstrates the positive effect SEZs have on improving the structure of production and exports of regions in favor of new technology.

Figure 10
The structure of Poland's exports in the 2004–2011 period by PKD sectors accounting for more than 4% of total annual exports in any of the years in the 2004–2011 period



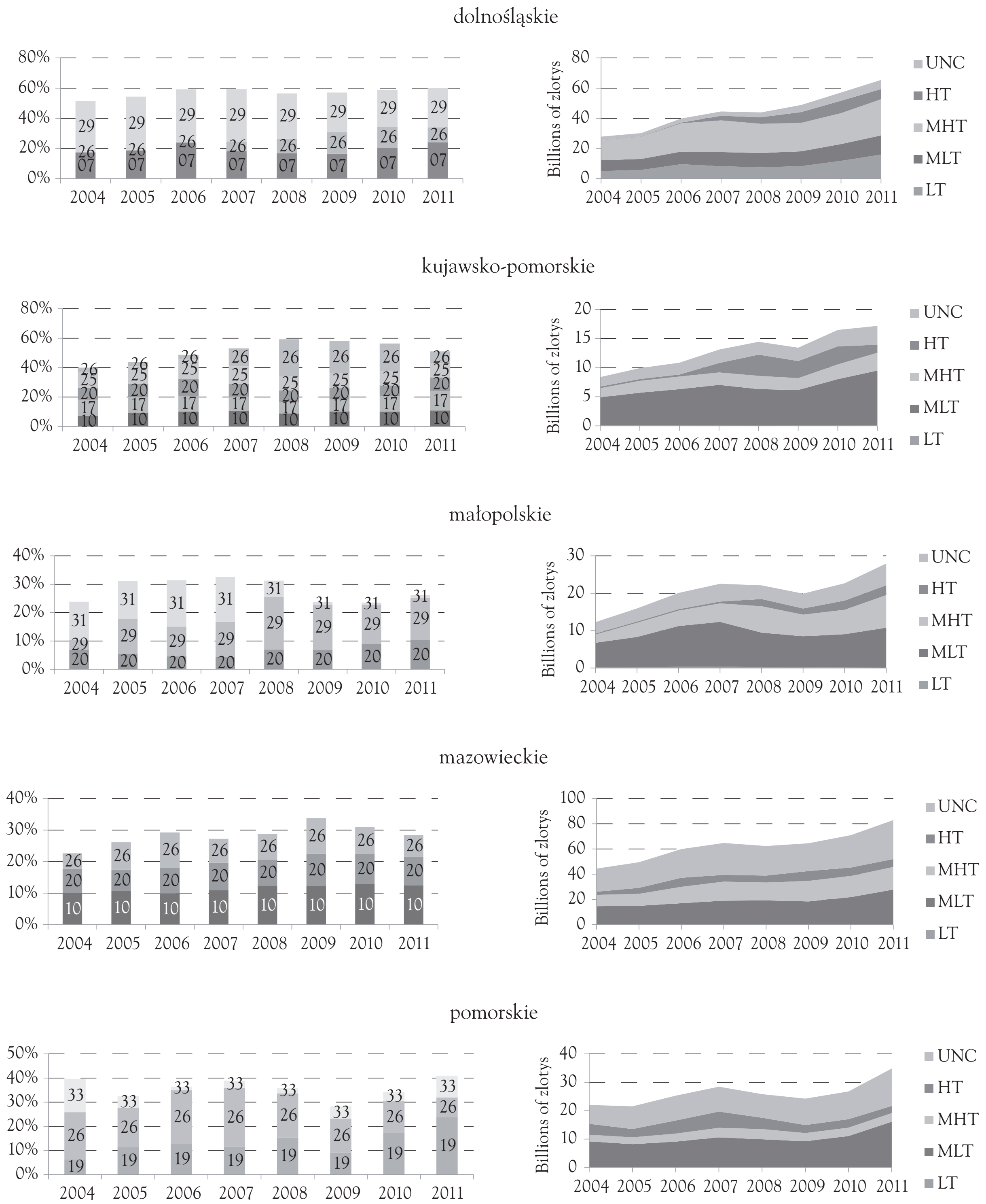
Note: PKD 2007 sectors
01 – Crop and animal production, hunting and related service activities
02 – Forestry and logging
03 – Fishing
05 – Mining of coal and lignite
06 – Extraction of crude oil and natural gas
07 – Mining of metal ores
08 – Other mining and quarrying
09 – Mining support service activities
10 – Manufacture of food products
11 – Manufacture of beverages
12 – Manufacture of tobacco products
13 – Manufacture of textiles
14 – Manufacture of wearing apparel
15 – Manufacture of leather and related products
16 – Manufacture of wood and of products of wood and cork, except furniture, manufacture of articles of straw and plaiting materials
17 – Manufacture of paper and paper products
18 – Printing and reproduction of recorded media
19 – Manufacture of coke and refined petroleum products
20 – Manufacture of chemicals and chemical products
21 – Manufacture of basic pharmaceutical products and pharmaceutical preparations
22 – Manufacture of rubber and plastic products
23 – Manufacture of other non-metallic mineral products
24 – Manufacture of basic metals
25 – Manufacture of fabricated metal products, except machinery and equipment
26 – Manufacture of computer, electronic and optical products
27 – Manufacture of electrical equipment
28 – Manufacture of machinery and equipment n.e.c.
29 – Manufacture of motor vehicles, trailers and semi-trailers, with the exception of motorcycles
30 – Manufacture of other transport equipment
31 – Manufacture of furniture
32 – Other manufacturing
33 – Repair and installation of machinery and equipment

Source: As in Figure 1.

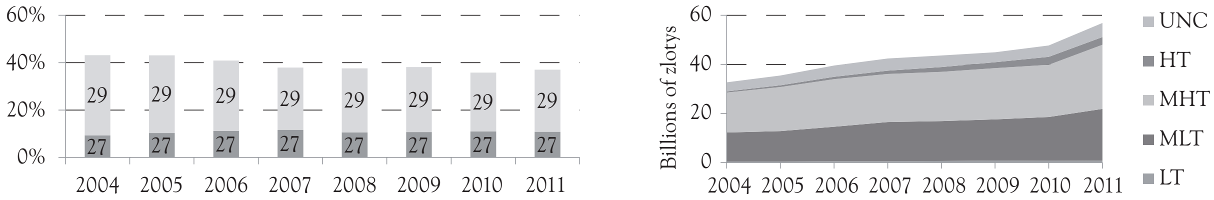
Specialized pharmaceutical industry products accounted for just over 1% of Poland's total exports in 2010, followed by 0.9% in 2011. A definite comparative advantage in the trade of such products in 2011 was found in Łódzkie (1.17), Pomorskie (1.32) and Wielkopolskie (5.10). At the same time, these three regions had the intensity of SEZ investment in the specialized pharmaceutical industry, at 1.59, 3.55 and 1.34 respectively. Thus, despite the relatively small role of pharmaceuticals in these regions' exports, their comparative advantage in relation to other regions is significant, and SEZ investment strengthens it further.

Figure 11

The structure of exports in selected Polish provinces, 2004–2011 (in billions of zlotys and %)



wielkopolskie



Left graph: PKD sectors accounting for more than 10% of a region's total exports in any of the years in the 2004–2011 period; PKD 2007 Polish Classification of Activities – see note for Figure 10.
Right graph: LT – low-tech industries, MLT – medium-low-tech industries, MHT – medium-high-tech industries, HT – high-tech industries, UNC – unclassified.

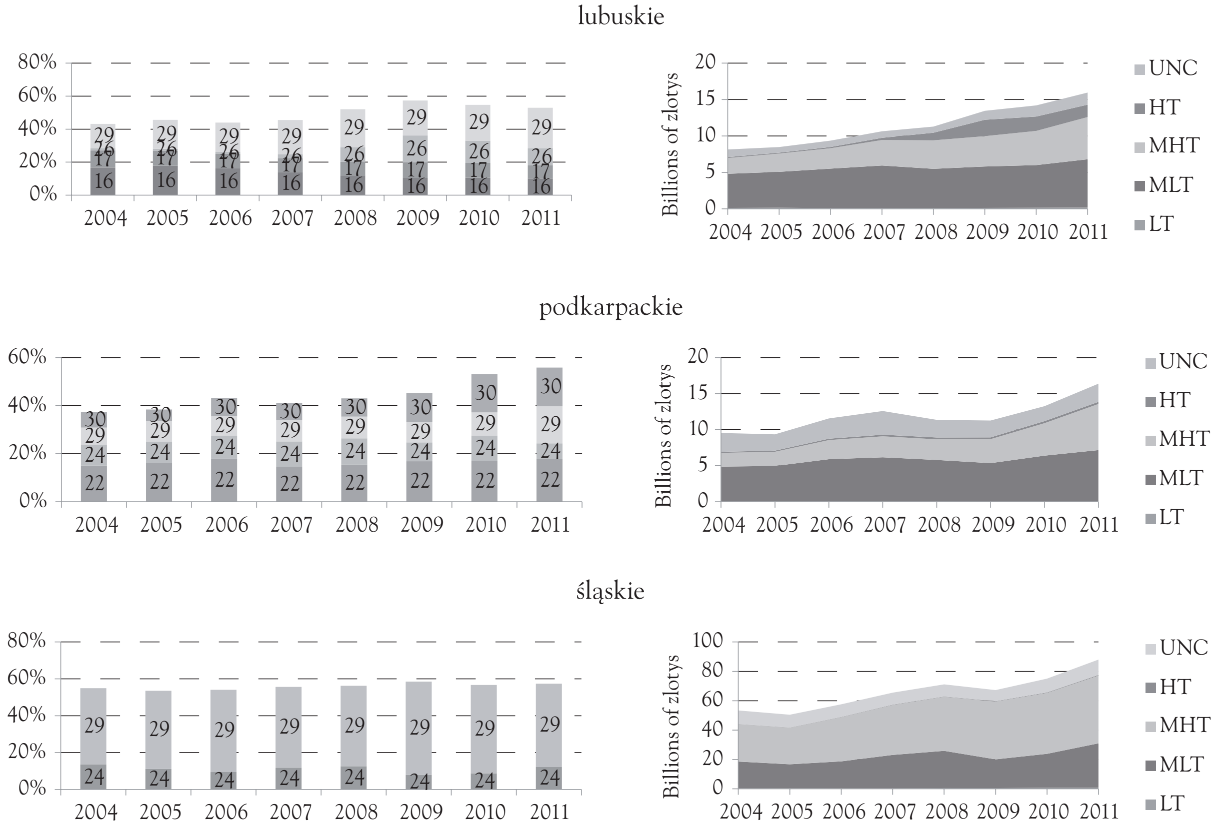
Source: As in Figure 1.

In 2004–2011, exports of products from medium-high technology industries remained at a relatively constant level, within 41.3%–42.7% of Poland's total exports. The following provinces contributed the most to this result: Śląskie province (28.5% of the total exports of medium-high tech industry products in 2011), Wielkopolskie (16.4%), Dolnośląskie (15%), and Mazowieckie (11.2%) (Figure 11). During the studied period, this structure remained basically unchanged. Śląskie was the only province to join the list of regions previously leading the charge in exporting high-tech industry products. Other regions developed at a similar pace, especially in those manufacturing and export sectors that benefited from investment made prior to Poland's EU entry.

Among products from medium high-tech industries, motor vehicles, trailers and semitrailers dominated, as well as components and parts for the automotive industry, accounting for 18.4%–19.6% of Poland's total exports. And despite the economic crisis and decreased demand for cars in the initial stage of the crisis, these exports maintained their position, primarily thanks to incentives for customers used by some EU countries in the form of old car scrapping programs and subsidies for the purchase of new cars. As a result, in 2004–2011, there was a relatively high proportion of motor vehicles and their parts and components in the exports of individual regions, ranging from 24% to 35% in Dolnośląskie, 14.9–21.7% in Lubuskie, 3.6%–14.9% in Małopolskie, 7.2%–15.5% in Podkarpackie, and 24.8%–33.8% in Wielkopolskie, to 41.4%–50.5% in Śląskie) (Figure 12). In the case of cars, a revealed comparative advantage was noted in the exportation of cars from Dolnośląskie (1.43) and Śląskie (2.45) regions, where the intensity of SEZ investment in the automotive sector is slightly higher. However, despite the existence of SEZ businesses in the automotive sector, the RCA index for Małopolskie and Podkarpackie did not exceed 1. This does not mean this industry is unimportant in these regions, but that they are definitely not among the leaders in comparison with other Polish regions. It should also be noted that, in the case of Łódzkie and Wielkopolskie, the RCA indices were 1.35 and 1.45 respectively, with a relatively lower level of SEZ investment in the automotive industry. This shows that the value of exports is much higher than the value of SEZ investment, testifying to high usage of the existing production capacity. Still, the success or disadvantage of each of these regions in exports is most often determined not by a well-developed and stable automotive industry, with many production facilities, but by individual investors (e.g. those active in Wielkopolskie and Podkarpackie provinces).

Figure 12

The structure of exports in selected Polish provinces, 2004–2011 (in billions of zlotys and %)



Left graph: PKD sectors accounting for more than 10% of a region's total exports in any of the years in the 2004–2011 period; PKD 2007 Polish Classification of Activities – see note for Figure 10.
Right graph: LT – low-tech industries, MLT – medium-low-tech industries, MHT – medium-high-tech industries, HT – high-tech industries, UNC – unclassified.

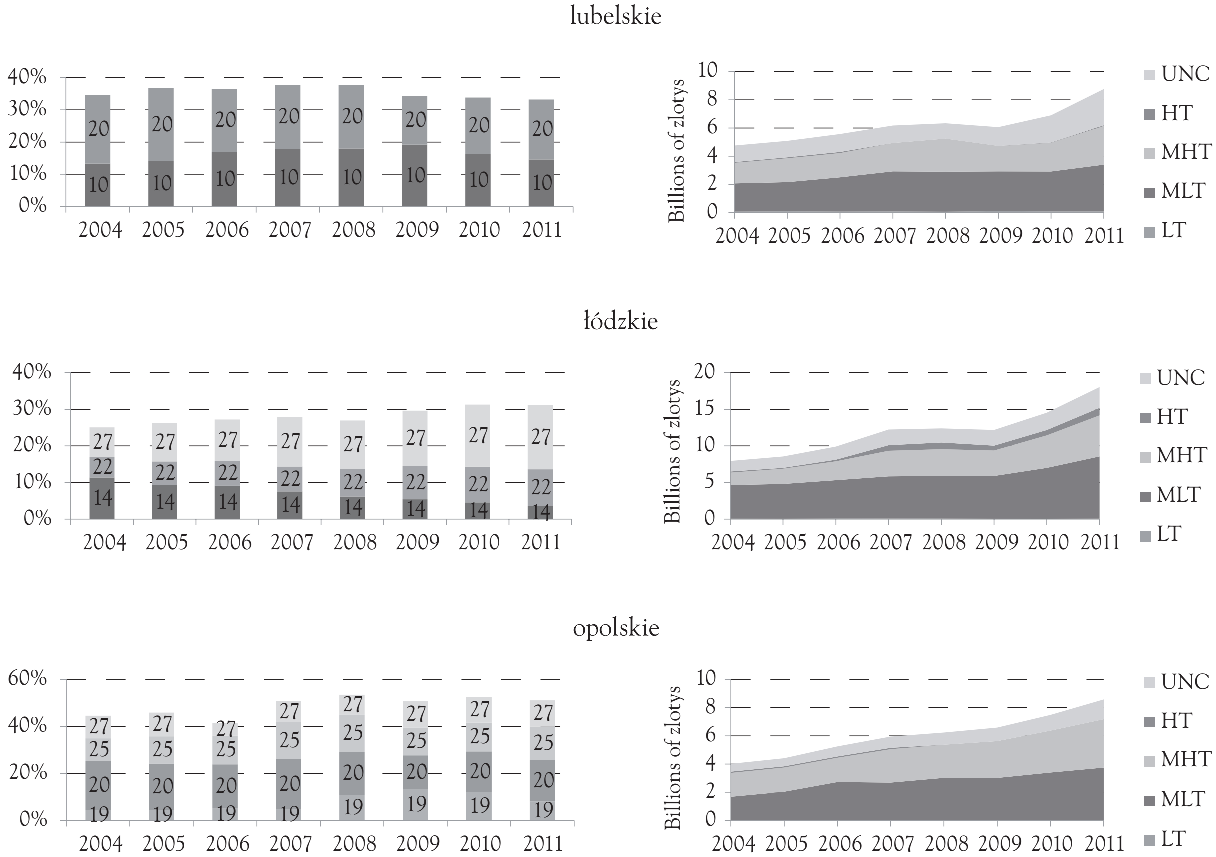
Source: As in Figure 1.

The group of products from medium high-tech industries with a relatively high share in Poland's total exports also includes chemicals and chemical products (up by 1.2 percentage points to 4.6% in 2011 compared with 2004) as well as products from the "manufacture of electrical equipment" sector (up by 1.5 percentage points to 5.5% in 2011). Chemicals and chemical products play a special role in the exports of Lubelskie (18.6% of the region's total exports in 2011), Opolskie (17.6%), and Małopolskie (10.4%) (see Figure 13). In addition to these three regions, a high revealed comparative advantage was also noted in Zachodniopomorskie, Kujawsko-Pomorskie, and Mazowieckie. In the case of Lubelskie, the intensity of SEZ investment in the "chemicals and chemical products" sector reached an unusually high level of 10.28. In the case of other provinces exporting chemicals and chemical products, it is difficult to find a clear link between exports and SEZ investment. In these provinces, production and sales on the domestic and foreign markets appear to be highly diversified.

As far as electrical equipment is concerned, it is slightly more prominent in the exports of Łódzkie (17.5%), Opolskie (11.2%), and Wielkopolskie (10.9%) (see Figure 13). These regions also have the greatest revealed competitive advantage in relation to other regions in Poland. Moreover, in these regions there is no SEZ investment in the production of electrical equipment, which means that the efficiency and international competitiveness of regions in this industry is mainly due to endogenous factors rather than external support from the state.

Figure 13

The structure of exports in selected Polish provinces, 2004–2011 (in billions of zlotys and %)



Left graph: PKD sectors accounting for more than 10% of a region's total exports in any of the years in the 2004–2011 period; PKD 2007 Polish Classification of Activities – see note for Figure 10.
Right graph: LT – low-tech industries, MLT – medium-low-tech industries, MHT – medium-high-tech industries, HT – high-tech industries, UNC – unclassified.

Source: As in Figure 1.

Notably, there is a negative trend in the structure of exports by Polish regions reflected by a small fall in the role of medium-low technology industries in total exports (from 51.1% in 2004 to 47.1% in 2011) in favor of an increased role of low-tech industries. The exporters with the greatest comparative advantages in the exports of low-value added agricultural products are Zachodniopomorskie (RCA = 4.17), Wielkopolskie (3.30), Lubelskie (2.48), Lubuskie (1.61) and Warmińsko-Mazurskie (1.58). In the fish sector, Zachodniopomorskie (10.40) and Pomorskie (5.63) top the list.

As for medium low-tech industries, the main representatives of this category of products in Poland's exports were food industry goods, which recorded a significant increase from 4.9% in 2004 to 7.1% in 2011. However, this relatively high increase did not offset a decline in the position of beverages and tobacco products, clothing, leather and leather products and wood, furniture and metals. It is also difficult to grasp the relationship between SEZ investment in the food industry and the revealed comparative advantages of regions in exporting food industry products.

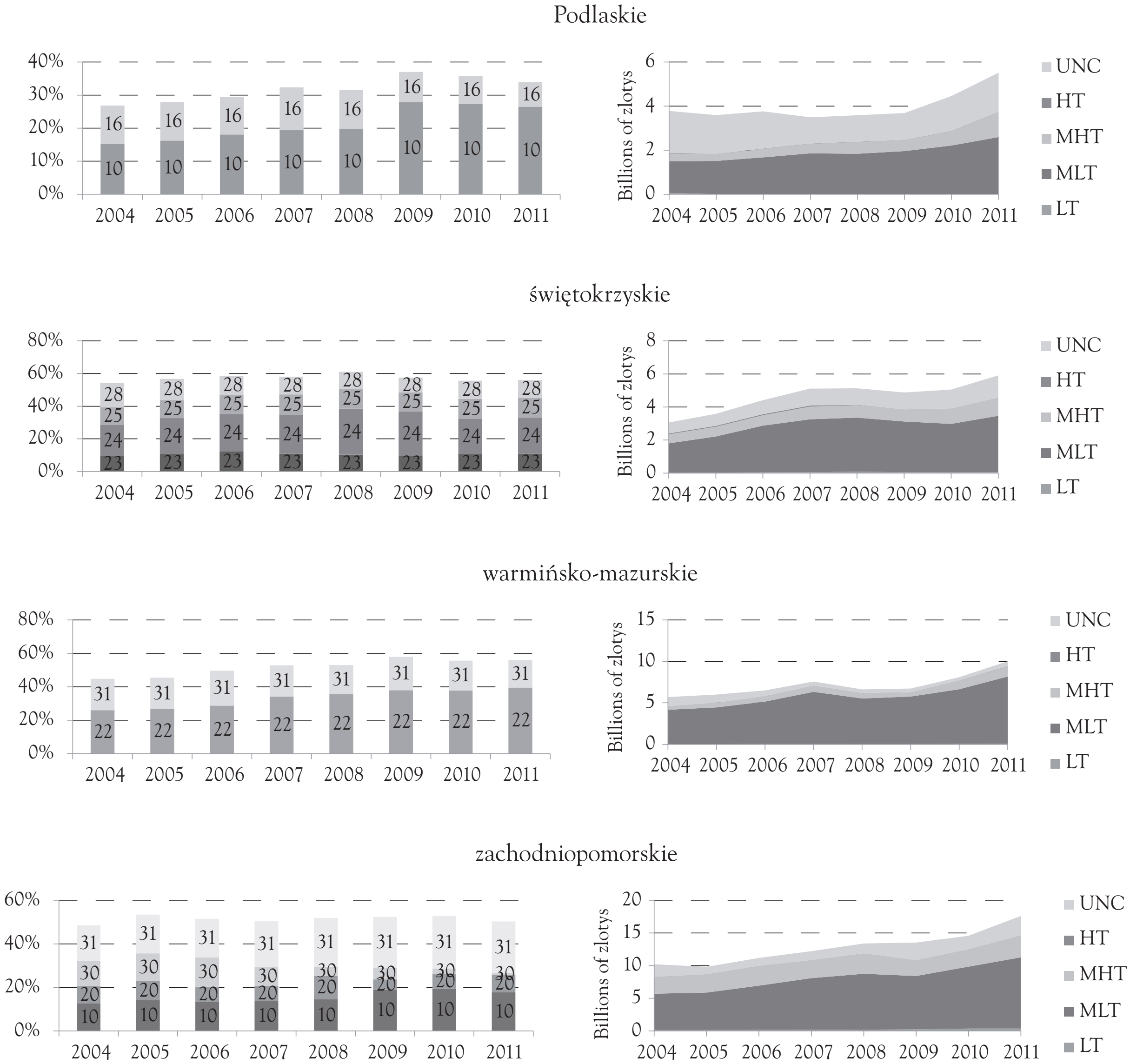
The aforementioned decline in the position of medium low-tech industries was noticeable during the economic crisis of 2008–2010, when the position of low-technology industry goods, including raw materials and no-value-added agri-food products, increased by 1.5 percentage points to 4.9% in 2011. This was mainly due to a higher share of exports from the "metal ore mining" sector (the share increased from 1.9% in 2004 to 3.3% of Poland's total exports in 2011). The increase was the most strongly influenced by increased exports of metal (copper) ores in the Dolnośląskie region, both in relative terms and in absolute terms, from 72.4% in 2004 to 84% (with an RCA of 7.34). Another contributing factor was that Śląskie maintained its 5% contribution to the exports of low-technology industry goods, specifically coal and coke (RCA = 5.45) (see Figure 14). The group of provinces exporting natural resources also includes Wielkopolskie, which does not take advantage of its high revealed comparative advantage in oil and gas exports (RCA = 8.09), settling for a less than 1% share of these products in the region's overall exports.

Among Poland's provinces, alongside those that specialize in exporting specific high or medium low-technology products as well as attractive raw materials (coal, copper), are also those regions that, on account of their exports, should be classified among exporters of low or possibly medium low-technology products. This applies to Podlaskie, Świętokrzyskie, Warmińsko-Mazurskie, and Zachodniopomorskie provinces. In the case of Podlaskie and Zachodniopomorskie, products from the agri-food processing sector account for a significant portion of their exports (26.5% and 17.7% respectively); in Zachodniopomorskie, furniture exports also figure prominently (at 23.8%). Notably, Pomorskie, in comparison with other provinces, also has a revealed comparative advantage in exporting wood and cork products (4.19), as well as machinery (2.49) and electrical equipment (1.74).

In Świętokrzyskie, metals are still the most important export item (22.1% in 2011), in addition to machines and equipment and other non-metallic mineral products, which, with a revealed comparative advantage for the exports of these goods, shows that the region takes advantage of its economic potential. Warmińsko-Mazurskie's exports are chiefly based on rubber and plastic products (39.6%) as well as furniture (16.4%), which means those goods in which the region achieved the highest RCA indices (7.22 and 4.86 respectively).

Figure 14

The structure of exports in Polish provinces, 2004–2011 (in billions of zlotys and %)



Left graph: PKD sectors accounting for more than 10% of a region's total exports in any of the years in the 2004–2011 period; PKD 2007 Polish Classification of Activities – see note for Figure 10.
Right graph: LT – low-tech industries, MLT – medium-low-tech industries, MHT – medium-high-tech industries, HT – high-tech industries, UNC – unclassified.

Source: As in Figure 1.

Summary

The above analysis confirms the hypothesis that foreign trade reinforces the existing differences in the development of Poland's regions, and an inconsistent state intervention policy adds to this trend.

Based on the study, it is possible to formulate several conclusions about Polish provinces' trade ties with abroad.

First, the most developed regions in western Poland as well as some northern and southern regions had the largest share in Poland's overall exports, in both absolute and relative terms, in relation to sold production as well as gross domestic product. This confirms the rule that the more developed a region is, the more open it is and the more involved it is in foreign trade, thus contributing to the country's economic growth. At the same time, weaker regions are far less focused on foreign trade, which aggravates their already difficult situation in terms of development.

Second, the study showed that, in terms of foreign trade, Poland's regions generally tend toward export markets that are geographically close, which positively validates some theories on the location of investment projects. Our study also confirms the results of previous studies conducted in this area (Gawlikowska-Hueckel, Umiński, 2005, p. 76; Gawlikowska-Hueckel, Umiński, 2008, p. 57; Gawlikowska-Hueckel, Umiński, 2009, p. 63). Despite Poland's eight years as an EU member, foreign investors focusing on selling their goods on the EU internal market still do not perceive Poland as a homogenous, stable country with considerable demand potential and locate their investment projects close to the border with Germany or the Czech Republic. Provinces in northern Poland, in turn, have closer ties with Norway, which is part of the EFTA, and provinces in eastern Poland have ties with the Commonwealth of Independent States, mainly Russia and Ukraine.

Third, the export orientation of Polish provinces has its justification in the structure of goods sold abroad, based on a number of relationships. More affluent regions, better prepared for modern investment projects and having a labor force that is better qualified and better suited to meet the expectations of future employers, as well as having ties with science and research centers, offer products from high and medium high-technology industries. These goods attract buyers mainly in EU and EFTA countries, which has enabled these regions to specialize in exports to markets within the European Economic Area.

Less developed regions, on the other hand, whose industry is based on raw materials and agricultural products, offer products mainly for the domestic market, becoming – in the case of some products – a provider of simple components for manufacturers in other Polish regions. Due to the relatively small openness and low level of internationalization of these regions, the main foreign buyers of their goods are members of the Commonwealth of Independent States, as a result of which manufacturers in these regions are not forced to embrace technological change. It seems that provinces in eastern Poland should be increasingly attractive not only because of their cheaper labor, but also because of the improving qualifications of local employees, mainly thanks to training programs financed from European Union funds. Also, much of the transport infrastructure has been upgraded with EU funds, which should encourage investors and prospective exporters to seek investment opportunities in the less affluent eastern Polish provinces that have been largely bypassed by investors so far. However, the existing trade ties will not change the existing specialization of Poland's provinces: these ties reinforce the positive trends in the development of high-tech production in richer regions that export their products to EU and EFTA countries, while not providing any incentives or imposing changes in production in weaker regions that focus on exports to the CIS.

Fourth, it seems that a certain incentive to alter the specialization of the poorer regions and, consequently, the structure of their exports, could be state aid granted both from European funds and as part of special economic zones, especially as poorer regions with lower GDP per capita can obtain more support. However, the problem is that it is often investors themselves who decide where subzones of SEZs should be created, in line with the principle of agglomeration and the tenets of P. Krugman's new economic geography theory; as a result, new technologies are coming to wealthy provinces. Some high-tech investment projects can also be found in the eastern part of Poland, but these are isolated cases. In such situations, the investor can monopolize the local labor market, which could have serious social consequences for the region. It can therefore be argued that state aid offered to regions in Poland is ineffective in terms of changing the structure and direction of exports and is not producing the expected results.

In summary, the analysis shows that international trade is an important factor influencing the competitiveness and attractiveness of Poland's provinces. State intervention, including in the form of special economic zones, has clearly failed to reduce regional disparities and improve conditions for international trade, particularly in eastern Polish regions, as seen in Table 7.

Table 7

A comparison of the revealed comparative advantage indices of Poland's provinces in exports and the intensity of SEZ investment in selected industries in 2011

		dolnośląskie	kujawsko-pomorskie	lubelskie	lubuskie	łódzkie	małopolskie	mazowieckie	Opolskie	podkarpackie	podlaskie	pomorskie	śląskie	świętokrzyskie	warmińsko-mazurskie	wielkopolskie	zachodniopomorskie
01	A	0.30	0.69	2.48	1.61	0.73	0.46	0.69	0.97	0.09	0.69	0.16	0.24	0.10	1.58	3.30	4.17
02	A	2.16	0.00	0.00	7.68	0.12	0.40	0.45	0.00	0.09	0.08	0.97	0.02	0.38	0.00	0.26	6.29
03	A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.63	0.00	0.00	0.62	1.66	10.40
05	A	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.45	0.00	0.00	0.00	0.00
06	A	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.02	0.00	0.00	0.00	8.09	0.00
07	A	7.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
08	A	1.68	1.44	0.00	0.00	1.26	1.85	0.38	0.00	1.75	0.13	0.00	0.07	24.18	0.10	1.00	0.16
09	A	0.00	0.00	0.00	3.22	0.00	11.86	0.63	0.00	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	A	0.22	1.57	2.10	0.62	1.22	1.21	1.78	0.88	0.29	3.83	0.51	0.32	0.45	1.14	1.24	2.41
10	B	0.42	.	.	1.54	1.25	1.03	1.48	12.22	0.27	0.94	0.75	0.67	0.04	0.40	2.22	0.04
13	A	1.37	2.70	0.17	1.19	4.76	0.36	0.17	0.78	0.08	0.97	0.34	0.54	0.71	0.92	1.99	0.79
13	B	1.23	.	.	6.54	3.88	.	0.02	.	0.16	3.19	.	.	.	0.01	.	0.99
16	A	0.23	0.76	1.71	5.64	0.33	0.54	0.12	1.59	2.45	4.19	1.45	0.24	1.23	2.60	1.37	3.20
16	B	0.05	.	.	0.45	.	0.23	0.07	4.09	4.12	14.01	0.15	0.04	.	0.81	0.02	10.10
17	A	0.81	6.57	0.32	4.01	0.63	0.48	0.68	0.40	0.09	0.70	1.96	0.08	1.01	0.21	1.10	0.62
18	A	0.05	1.79	0.96	0.34	2.66	3.64	1.67	1.56	0.22	1.62	0.20	0.22	0.31	3.21	0.71	1.00

17–18	B	0.91	4.12	0.04	2.63	0.74	2.13	4.15	.	0.27	0.57	2.31	0.17	1.95	0.47	0.19	0.10
20	A	0.37	2.04	4.10	1.15	0.92	2.28	2.00	3.87	0.73	0.04	0.13	0.22	0.02	0.06	0.38	1.65
21	A	0.29	0.00	0.33	0.40	1.17	0.66	0.75	0.00	0.79	0.00	1.32	0.00	0.00	0.00	5.10	0.02
20–21	B	1.19	0.31	10.28	.	1.34	1.22	0.84	.	0.72	.	3.55	0.40	0.48	0.17	1.59	0.84
22	A	0.95	1.40	0.42	0.34	1.84	0.66	0.65	0.83	3.26	0.70	0.49	0.74	0.51	7.22	0.87	0.45
22	B	0.88	0.90	0.12	1.68	1.27	0.31	0.22	0.04	1.01	0.48	0.44	0.44	0.20	5.71	0.58	3.20
23	A	0.36	0.09	0.07	1.26	2.11	1.89	0.51	0.62	1.32	0.18	0.18	1.76	5.73	1.08	1.02	0.57
23	B	0.36	0.91	.	0.15	2.85	0.39	2.00	0.02	0.14	.	0.63	1.38	4.13	0.18	1.59	1.02
24	A	0.10	0.35	0.18	0.42	0.21	1.87	0.56	0.63	1.66	0.02	0.01	3.15	5.70	0.14	0.16	0.14
25	A	0.90	1.86	1.43	1.30	1.11	1.50	0.50	2.69	0.93	0.38	1.05	1.05	2.29	1.11	0.61	1.32
24–25	B	0.84	0.47	3.86	0.85	1.73	1.02	0.75	2.08	1.39	0.17	0.73	0.73	1.51	0.83	2.05	0.31
26	A	2.21	1.75	0.06	2.26	1.01	1.93	1.51	0.01	0.23	0.05	1.31	0.11	0.01	0.12	0.19	0.02
27	A	0.85	0.18	0.07	0.19	3.29	0.60	1.36	2.10	0.05	1.74	0.14	0.67	0.19	0.14	2.03	1.05
26–27	B	1.37	3.68	.	1.11	0.84	0.40	2.04	.	0.41	0.19	3.80	0.19	.	0.11	0.79	0.07
28	A	0.99	0.86	1.72	1.35	0.52	0.78	0.78	1.51	0.98	2.49	0.97	0.58	3.80	2.77	1.41	0.54
28	B	1.92	.	0.02	1.46	1.81	1.24	0.05	0.80	0.18	1.53	0.19	0.75	0.05	0.07	.	0.06
29	A	1.43	0.11	0.21	1.35	0.22	0.82	0.09	0.34	0.85	0.13	0.08	2.49	0.36	0.02	1.45	0.14
29	B	1.21	.	0.14	0.44	0.12	1.34	0.01	.	1.05	.	0.03	2.35	0.58	.	0.44	0.04
31	A	0.34	1.49	1.71	0.68	0.62	0.24	0.20	0.39	1.05	0.61	0.50	0.14	0.06	4.86	2.67	6.65
32	A	0.93	2.97	0.16	0.66	3.61	0.52	0.59	0.09	1.25	0.76	0.28	0.33	0.09	0.11	2.46	1.23
31–32	B	1.13	.	.	0.42	0.15	0.29	0.01	.	4.04	2.02	.	.	2.66	4.56	5.95	.

Explanation: A: The revealed comparative advantage of a province in exporting products and services from a given PKD sector in comparison to other provinces; B: The intensity of SEZ investment in a specific industry in a given region in relation to the level of SEZ investment in that industry in all provinces in Poland.

Source: Own calculations based on Customs Administration and Economy Ministry data.

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