

## FINANCING INVESTMENTS IN THE REGIONAL STRUCTURE IN THE FACE OF CRISIS PHENOMENA IN POLAND

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**Purpose:** Assessment of changes in the size of investment outlays and territorial diversification of investment activity in the conditions of crisis phenomena, broken down by selected groups of entities forming the national economy in Poland.

**Design/methodology/approach:** The method of critical analysis of the literature on the subject and the method of comparative analysis in the field of empirical and statistical data in the generic and territorial arrangement according to selected categories of regional and subregional units.

**Findings:** The financial diversification of the scope of investment activity of groups of entities operating in the national economy was indicated, in detail in terms of the central and local government subsectors. The scale and directions of changes in spatial disproportions of investment potential in regions and subregions in Poland were identified, taking into account changes resulting from the observed crisis phenomena in the period 2010-2021.

**Research limitations/implications:** The presented research results are limited by the availability of empirical data in detailed territorial systems. Due to the currently observed dynamic changes and economic turbulence, it is advisable to constantly update data and further analyzes in the conditions of ongoing crisis phenomena.

**Practical implications:** The practical dimension of the analysis refers to possible applications in the preparation of diagnoses and plans for socio-economic development at various levels of public administration competence.

**Social implications:** The results of the research may provide information for public sector entities supporting the processes of programming public investments in order to achieve socio-economic cohesion, reduce social disparities and improve the living conditions of the population.

**Originality/value:** The paper contains the results of analyzes on the consequences of crisis phenomena affecting the national economy and the ability of its selected components to undertake investment outlays. The applied territorial approach provides new knowledge that can be used in further detailed scientific research and in the decision-making process regarding the conduct of investment policy at the national and regional level.

**Keywords:** investments, regional development, economic crisis, public sector.

**Category of the paper:** Research paper.

## **1. Introduction**

The political transformations in Poland led to focusing on complex political, social and economic processes of an internal nature, as well as those taking place in the external environment of the state. The socio-economic development was influenced by various factors, the sources of which should be sought already in the systemic transformation initiated in 1989 and in the subsequent economic and social transformations, especially after Poland's accession to the European Union (EU). The progressive globalization processes were also significant, as they meant greater openness of the world's states to international cooperation, increasing the rank of human and social capital, and in European conditions they were clearly manifested through the cohesion policy and supporting activities that responded to the needs of local communities and the development aspirations of the regions.

In addition to the introduction of market economy principles, also giving a new dimension to public authorities at various levels was a key element of changes that became the basis for further development in the conditions of coexistence of the public and private sectors in the market economy and cooperation to improve the living conditions of the society. These phenomena were accompanied by the volatility of economic conditions, the causes of which appeared in various areas of the world economy, but through global connections, which covered many countries with a diverse economic situation, they also affected Poland. In crisis situations, it was the public sector that took action to eliminate threats to the stability of specific sectors of the economy, reduce negative social consequences or sustain economic growth.

When attempting to study the course of socio-economic development processes in Poland, it is necessary to assess investment activity broken down into private sector investments and public sector investments implemented in the economy, and taking into account regional or even local differences. The aim of the article is to present the results of research conducted in the field of investment financing in Poland in 2010-2021 in terms of the assessment of changes in the amount of investment outlays and territorial differences in investment activity in the conditions of crisis phenomena, broken down by selected groups of entities forming the national economy.

## **2. Theoretical approach to investments in the public sector in relation to development processes and crisis phenomena**

In the conditions of developing a market economy in Poland, it was necessary to restore the appropriate position of the public sector, including in particular giving a new dimension to institutions and organizations that could function effectively at the local and regional level.

During this period, a new view on development processes was formed, referring to the concept of regional and local development, and its importance was additionally increased by Poland's accession to the EU and joining the concepts of European regionalism (Jarosiński, 2001; Kleer 2006). Poland's participation in the European integration processes can be treated as a development impulse that contributed to the defining the most important development priorities and the definition of plans for their implementation, additionally with their significant support through new financing opportunities for various development projects undertaken in the enterprise sector as well as in the public sector (Laursen, Myers, 2009; Jarosiński, Opalka, 2021).

The role of the public sector is perceived in the context of a significant stimulator of socio-economic development due to the nature of the public functions performed and the tasks assigned to it for the benefit of specific social groups. Without going into detailed considerations on the model of functioning of the public sector in the economies of various countries, a common feature of public sector entities can be considered involvement in many areas of investment activity, which largely affects changes in development conditions in the short and long term (McCartney, 2015). Undertaking research on the financial dimension of public investments, on the one hand, leads to focusing on identifying appropriate sources of financing in order to secure funds for the implementation of these investments, on the other hand, it should concern the role of investment outlays, considered as a development impulse on the scale of the national economy of a given country, or the regional dimensions of a given economy (Ocolisanu et al., 2022).

Own funds collected and spent within the budgets of individual units are usually indicated as the basic source of financing investments by public sector entities (Gubernat-Ulatowski, 2016; Dworakowska, 2015). The study of the budgets of public sector entities can be considered an important instrument for identifying factors shaping investment capacity, due to the direct dependence of budgetary revenue sources on the state of the economy in various territorial terms, as well as previously shaped development processes, often having a regional or even local dimension. Based on previous research, it can be concluded that there was a permanent shortage of budget funds in Poland that could be spent by public sector entities to finance development tasks (Kostecki, 2020; Cenkier, 2016; Opalka, 2020). Based on the analyzes of investment needs and streams of budget funds allocated for investments by the above entities, it can be concluded that the public sector, both at the national and regional level, encounters numerous difficulties in the implementation of statutory own tasks and there is a need to search for complex solutions, which would allow to finance the infrastructure elements necessary for the proper provision of public services (Sawant, 2010; Jarosiński, Opalka, 2015).

Crisis phenomena observed in the global dimension in 2007-2008, the effects of which in the economies of European countries became clearly noticeable in 2009-2010 and subsequent years, were associated with the need to pay attention to complex internal processes and to processes occurring in the external environment countries, especially in the face of ongoing

globalization processes. The aforementioned financial crisis contributed to making significant changes in terms of management conditions and adjusting the scope of supervision and direct involvement of public authorities, mainly at the government level. It should be mentioned that due to very clear disproportions in terms of development factors, some of the expected consequences appeared with varying intensity in individual countries or regions, including the example of Poland showing a rather limited impact of the crisis on the economic situation (Opalka, 2021). However, referring to the period 2010-2021 adopted for this analysis, one can see difficult to predict events, such as the ongoing COVID-19 pandemic and the armed conflict between Russia and Ukraine, which additionally contributed to the instability of the economy of many regions of the world, which affects the level of public income and thus the investment capacity of public sector entities at the level of both the state and local government administration.

Crisis phenomena, regardless of the reasons for their occurrence, always affect the sphere of the public finance sector. The economic downturn may result in a decrease in the volume of sold production, which in turn will lead to a decrease in the value of revenues and, consequently, pre-tax income in enterprises. As a result, there is a phenomenon of decreasing tax liabilities due to income tax and tax on goods and services, which are supplied to the state budget, and there may also be a decrease in the volume of some components of own income of local government units, which in turn leads to a reduction in the volume of investment capital and to growing financial barrier to undertaking new public investments (Kollatz-Ahnen, Roick, 2018).

The deterioration of the economic situation as a result of the occurrence of crisis phenomena may lead to changes in both the income situation of public sector entities and organizational entities, but also to significant changes in the volume and structure of expenditures in this sector (Jarosiński, 2022). The change in the volume of budgetary expenditure may be directly related to the conditions that may arise in the face of unplanned reductions in budgetary revenues, which in turn may affect expenditures that are not fixed. In particular, changes are possible on the side of the amount of investment outlays that would be implemented as part of the budgets of public entities in conditions if crisis phenomena did not occur. As a consequence, the planned investment implementation scenarios are abandoned and there is a need to reduce investment expenditure, which is caused by the impact of unfavorable crisis phenomena and economic downturn (OECD, 2019).

A decrease in budget revenues does not automatically mean a reduction in the volume of investment expenditures. If the implementation of investments already started in a given entity takes place, then it may be necessary to look for additional sources of financing in order to complete such investments on time and achieve the planned quantitative and qualitative effects in the sphere of public services (Quak, 2018). Such a scenario will not apply in a situation where public entities do not have sufficient creditworthiness and cannot incur further liabilities on the financial markets. Due to the specificity of the investment activities of individual public entities, both at the state and local government level, an individualized approach to the assessment of

the socio-economic situation in local and regional terms is appropriate here, due to the fact that crisis phenomena affect with different strength on economic processes taking place in these units.

In the conditions of crisis phenomena, there may also be a significant increase in the base interest rates set by central banks, which in turn will affect the interest rates on loans offered by commercial banks. In such conditions, entities and organizational units of the public sector may find themselves in an additional difficult situation, consisting in the need to incur liabilities generating higher burdens related to the servicing of loans and credits. Such a situation requires, as already mentioned, thorough research and an individualized approach to the issue of financing investments in these entities due to the differences in the income situation and economic potential, as well as the condition of public finances in the state.

Referring to the recent years and the current situation, it should be emphasized that crisis phenomena go beyond the scope of economic planning even in the medium term, because they result from events that are not directly economic in nature, but rather from threats to global security and are caused by factors that are difficult to predict. It then becomes necessary to change the structure of public expenditure, which often leads to a change in the priorities of such expenditure, shifting the main burden to current expenditure. The COVID-19 pandemic clearly proved that in the conditions of the crisis, the public sector was forced to significantly reorient the directions of public intervention to increase current expenditure, not only on health care (Klimczuk, 2021). There are many scenarios of further development of the situation in the conditions of the crisis, one of such scenarios is the continuation of investment spending while increasing the budget deficit and, consequently, public debt. Therefore, the key issue will be to assess to what extent public sector entities have budgetary resources adequate to the increased scope of current tasks and at the same time allowing to maintain investment capacity. Thus, it is worth referring to the current directions and capabilities of public sector entities in terms of undertaking investment activity, which was covered by the study presented in this paper.

### **3. Methodical approach and results of empirical research**

For the purposes of the study, the desk research method in the field of statistical resources, the method of comparative analysis and the method of critical analysis of the literature on the subject were used. A query of the database resources of the Central Statistical Office in Poland was carried out, in particular in the field of the Local Data Bank, Macroeconomic Data Bank and Knowledge Databases - Atlas of Regions, as well as Eurostat and AMECO (Annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs) as well as studies and summaries of data made available in the resources of

province self-government authority offices. During the empirical part of the research, extensive statistical material was collected, but due to the adopted concept of research, the time horizon presented in the text was narrowed to the years 2010-2021, and in some thematic scopes even to the years 2018-2021. The use of the above timeframe made it possible to highlight the characteristic changes taking place in the economic environment, and in particular the deterioration of the situation in the public finance sector due to the economic consequences of the crisis. Financial data characterizing the size of investment activity of various entities included in the public sector, as well as investment outlays incurred in the private sector, were analyzed. In the case of local government units at the local level, i.e. municipalities and districts, an aggregated approach was used in the territorial arrangement of subregions according to statistical units at the NUTS 3 level, which made it possible to analyze spatial differences and clearly present the obtained results in the form of choropleth maps.

Taking into account the results of empirical research, it should be noted that investment expenditure in the public sector in Poland were at a fairly high level, while the share of these expenditure in total investment expenditures in the national economy in Poland was gradually decreasing (Table 1). In 2010, the above-mentioned share of public sector investment expenditure was at the level of 43.5%, and a similar situation took place in subsequent years, until 2012. In 2018-2020, the analyzed ratio of the share of public sector investment expenditure was gradually decreasing to 2017, and starting from 2018 the share of these expenses started to increase again. The highest share in the last years of the analyzed period was achieved in 2020.

**Table 1.**

*Capital outlays in the national economy in Poland in 2010-2021 (in PLN billion)*

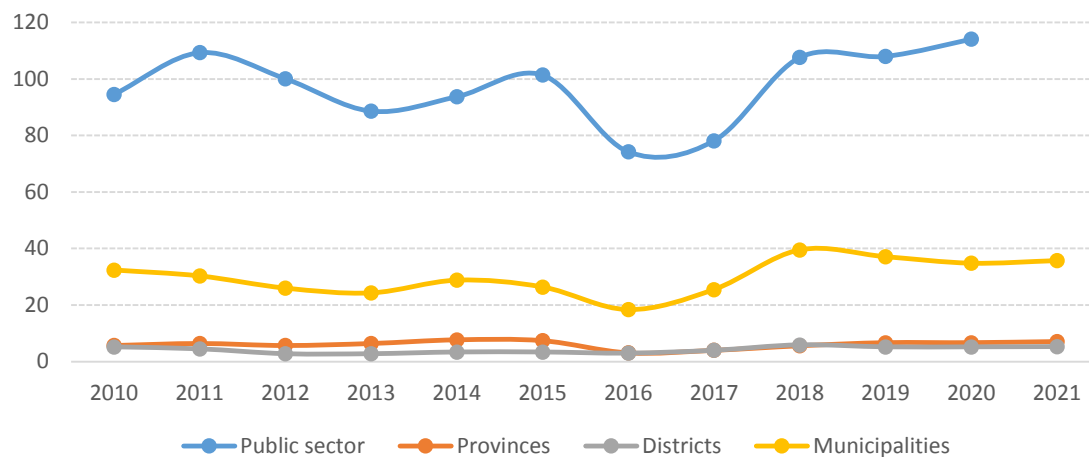
Specification	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Poland total	217.3	243.3	237.6	231.2	250.8	271.8	244.4	257.9	302.7	320.9	309.5	327.0
Public sector	94.5	109.3	100.1	88.6	93.7	101.4	74.2	78.1	107.6	108.0	114.1	-
- government subsector	51.2	68.1	65.6	55.1	53.8	64.2	49.7	44.6	56.6	59.0	67.4	-
- provinces	5.7	6.4	5.7	6.4	7.7	7.4	3.1	4.0	5.6	6.7	6.7	7.1
- districts	5.2	4.5	2.8	2.8	3.4	3.4	3.0	4.0	5.9	5.2	5.2	5.3
- municipalities	32.4	30.3	26.0	24.3	28.8	26.4	18.4	25.5	39.5	37.1	34.8	35.7

Source: own study based on the Local Data Bank, Central Statistical Office 2022, 12.10.2022.

In the analyzed period, capital outlays in the public sector in Poland did not always increase, while an increase was recorded in expenditure related to current liabilities. This mechanism is characteristic especially in times of crisis, when there is a need to undertake tasks of a very current nature and related to the need to secure specific social goals. Between 2010 and 2020, investment expenditure in the public sector remained relatively high overall, with the lowest level of this expenditure recorded in 2016-2017.

In the case of the local government sub-sector, it should be noted that the largest share in investment expenditures had expenditures implemented by self-government units at the local level, including expenditures implemented by municipalities. This is consistent with the current division of competences, in which communes are responsible for a wide range of public tasks,

including tasks that require specific investment outlays. Therefore, the expenditure of municipalities significantly exceeded both the investment expenditure of self-government provinces and districts throughout the analyzed period. The situation in this respect was quite stable, with the exception of 2016, when the surveyed expenditures amounted to PLN 18.4 billion. In accordance with the adopted methodology of the conducted research, it was possible to aggregate investment expenditures made within the public sector by various groups of entities, which is graphically illustrated in Figure 1.



**Figure 1.** Capital outlays in selected groups of public sector entities in Poland in 2010-2021 (in PLN billion).

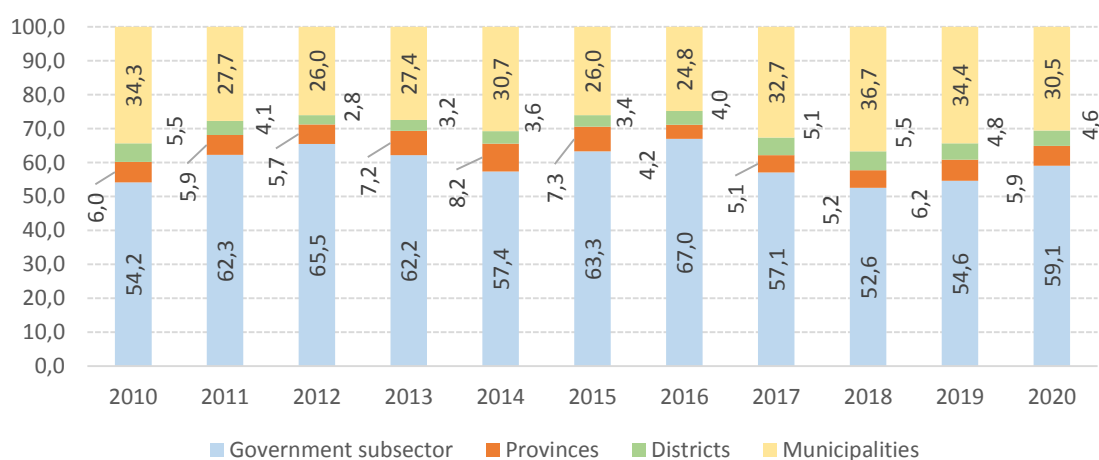
Source: own elaboration based on data from table 1.

It should be noted that investment expenditures in the public sector and in the local government sub-sector were characterized by varied dynamics of changes on an annual basis. The presented research results indicate that in the face of crisis phenomena, both in 2009-2011 and in 2020-2021, investment expenditure at the level of provinces, as well as districts and municipalities, stabilized or completely decreased compared to the previous years. The reasons for this phenomenon were determined mainly by the possibilities of shaping budget revenues from which investment expenditure were financed. In the conditions of crisis phenomena, the income situation of enterprises deteriorates and, consequently, the tax liability for income tax and value added tax (VAT) is reduced, which significantly affects the value of state budget revenues and budgets of local government units. In the event of emergencies of a crisis nature, the public sector is usually obliged to incur specific public expenditure, which are related to the need to implement social programs or to take protective and preventive measures.

The volume of investment expenditure in the public sector, including the central and local government sub-sector, in individual provinces, districts and municipalities depends on various factors. These factors are not easy to quantify due to the wide variety of parameters shaping the investment processes, as well as the large possibilities of choosing the investment financing path that entities and organizational units of the public sector have. Referring to Figures 1 and

2, it can be seen that investment expenditure in the public sector in 2010-2021 underwent significant changes, which were partly related to the effects of crisis phenomena.

In the years 2010-2012, an increase in investment expenditure in the government sub-sector and at the level of provinces was initially recorded, followed by a decrease in investment expenditure in these groups of entities. Changes in the value of investments in public sector entities were partly related to the slowdown in the growth rate of investments, and also reflected changes in preferences for spending public funds. It is worth noting that in local government units at the municipal level, a decrease in investment expenditure was recorded at that time. While in 2011 a relatively high level of expenditure was recorded, in the following years, from 2012 to 2014, a significant decrease in investment expenditure was recorded.



**Figure 2.** Structure of capital outlays in the public sector in Poland in selected years of the period 2010-2020 (in %).

Source: own elaboration based on data from table 1.

The presented graphical interpretation of the results of research on the size and structure of investment expenditure in the public sector indicates the variability of particular groups of expenditures according to groups of entities distinguished in the public sector. In a situation where the overall volume of public investment spending was decreasing, as it was in 2011-2013, in 2015-2017 and in 2019-2021, the share of government subsector spending increased at the same time. The maximum share of investment expenditure of the government subsector took place in 2016, when the total volume of public investments was the lowest during the period under review. In 2020, in view of the already noticeable symptoms of the crisis, a renewed increase in the share of investment expenditure implemented by the government subsector can be noticed and this phenomenon should be expected to continue in the coming years.

As has already been mentioned, crisis phenomena usually result in a reduction in investment expenditure, and are often associated with an increase in current expenditure of the public sector, related to the need to finance various tasks of a social nature. In the local government sub-sector in 2020-2021, i.e. during the crisis caused by the COVID-19 pandemic, a slight



increase in investment expenditure was recorded in districts and municipalities. Government expenditure at that time was also increasing, but it was also associated with a change in the structure of financed tasks. In addition, the increase in investment expenditure took place in the need to increase current expenditure, mainly for social reasons, but also as a result of protective measures aimed at the enterprise sector.

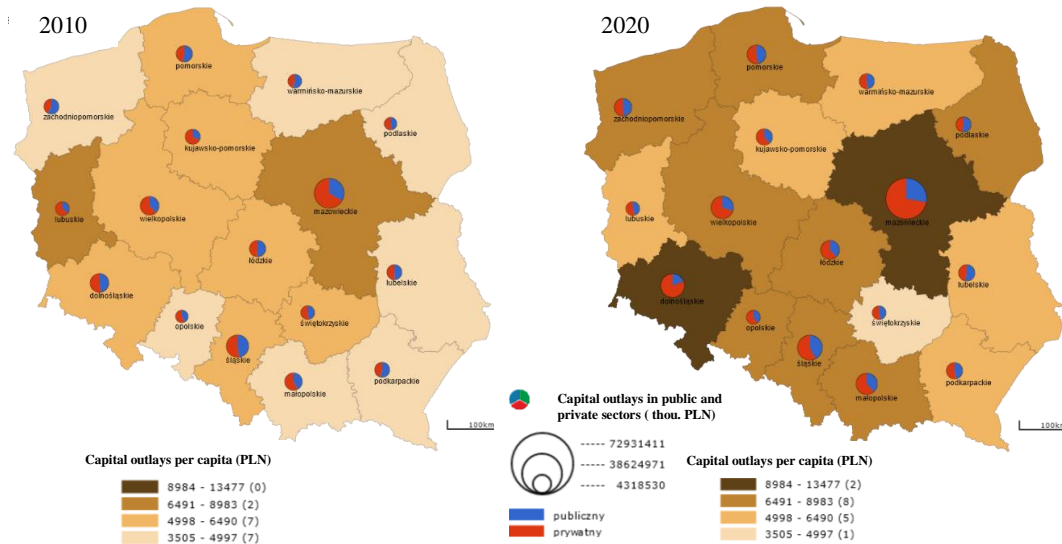
It can be assumed that in the conditions of crisis in the public sector there are multidirectional changes in the financing of investments, while the effects of crisis factors are revealed in investment budgets with a certain delay, which may involve the need to implement already started investments even in crisis conditions. In the case of Poland, EU funds also had a significant impact on the level of investment expenditure. Observation of statistical data for the years 2014-2015 and the period 2017-2020, when the level of investment increased in the entire public sector, leads to such conclusions.

Despite the long-term activity of the state and local government in the processes of strengthening social and economic cohesion, the spatial disproportions observed in Poland in terms of socio-economic potential are characterized by a significant degree of consolidation, resulting from the persistence of different economic growth rates in various administrative or functional territorial systems. Differences can be examined broken down into urban and rural areas, broken down by administrative units at the local, subregional or regional level. Reducing both the causes and consequences of negative economic phenomena in the territorial dimension remains an important element of the activities of public administration at various levels, which is manifested, on the one hand, in the development and implementation of support programs for areas affected by marginalization processes, and on the other hand, also programs aimed at maintaining the dynamics of growth in economically strong areas. In accordance with the approach developed within the EU, planning and supporting development at the regional level is particularly important. The effects obtained depend to a limited extent on public intervention in terms of investment expenditures, while the sustainability of economic development in regions is conditioned by the investment activity of all economic entities operating in the national economy, although spatial unevenness in the distribution of private sector entities should also be indicated (Nazarczuk, 2013).

Due to the development differences indicated earlier, an important approach was to examine investment outlays in the economy per capita in the province system. Partial results of the research for 2010 and 2020 are graphically illustrated in Figure 3. In addition, investment outlays in the national economy in total are also presented, taking into account the division into the public and private sectors.

The highest level of total investment expenditure per capita both in 2010 and in 2020 was recorded in the Mazowieckie province, respectively 8.2 thousand PLN and 13.0 thousand PLN. The results of the Mazowieckie province are related to the administrative system adopted for the analysis, in which including the capital city of Warsaw significantly increases the discussed expenditure ratio. Using the statistical system, the area of the Mazowieckie province without

Warsaw (i.e. the "regional Mazowieckie" region) would occupy a much lower position in terms of the value of investment expenditure per capita. The leading economic function of the main urban (metropolitan) center can be seen in most provinces, however, as other studies also indicate, in the case of the Mazowieckie province, the strong position of Warsaw is particularly clear (Tarkowski, 2015).



**Figure 3.** Capital outlays in the national economy per capita (in PLN) and capital outlays broken down by the public sector and the private sector (in PLN thousand) by provinces in Poland in 2010 and 2020.

Source: own elaboration based on data from the Atlas of Regions Knowledge Database, <http://swaid.stat.gov.pl/SitePagesDBW/AtlasRegionow.aspx>, access on 21.10.2022.

In the presented research results, an important element of the assessment of differences in the level of investment is the investment rate in the national economy in general and the investment rate in individual provinces. According to the definition adopted by the Central Statistical Office, the investment rate reflects the ratio of the value of gross fixed capital formation (which is considered identical to investment expenditure) to the value of the Gross Domestic Product. In the period 2010-2014, the investment rate in the system of provinces in Poland was at a fairly stable level and, despite noticeable differences of several percentage points, the level of the indicator was close to 20%. In the years 2015-2019, slightly greater fluctuations in the value of the examined indicator were observed and its decrease compared to previous years, both on average for Poland and in all provinces. Higher values of the investment rate in provinces with lower economic potential as compared to the values of the indicator in provinces defined as more economically developed were characteristic. The results of the study on the level of the investment rate in the economy broken down by provinces in 2010-2019 are presented in Table 2 and graphically illustrated in Figure 4, for selected provinces at the background of Poland.

At the beginning of the analyzed period, Lubuskie, Podkarpackie, Warmińsko-Mazurskie and Lubuskie provinces were characterized by a relatively high investment rate. In the years 2010-2012, the investment rate in these provinces remained at the highest level in the country,

reaching even 29.1% in Lubuskie. A relatively high rate was also recorded in Podlaskie and Świętokrzyskie provinces, where it reached their maximum values of respectively: 25.8% and 24.0%. Since 2013, in most provinces, the investment rate has clearly decreased, and despite the slowdown of this decline, recorded in 2015, in the next two years the value of the indicator remained at a low level. Again, an increase was recorded from 2018, although already in 2019 the investment rate decreased in some provinces, such as in the case of Warmińsko-Mazurskie, Łódzkie, Lubuskie and Zachodniopomorskie.

**Table 2.**

*Investment rate in the national economy broken down by provinces in 2010-2019 (in %)*

Specification	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Poland	19.7	20.5	19.6	19.0	20.1	20.4	18.5	17.6	18.7	18.9
Dolnośląskie	18.9	19.3	18.8	19.6	19.8	19.1	18.5	18.9	20.3	22.3
Kujawsko-Pomorskie	22.2	21.7	18.5	17.6	19.8	22.8	15.5	15.6	16.7	16.1
Lubelskie	20.7	23.1	20.9	20.0	21.4	20.8	15.3	15.9	18.3	19.3
Lubuskie	29.1	29.1	21.7	19.5	17.0	19.7	18.6	17.1	17.3	16.8
Łódzkie	20.5	22.4	23.2	21.2	20.1	20.7	17.3	16.2	16.6	17.1
Małopolskie	20.1	20.3	19.9	18.6	19.1	20.4	17.3	16.4	16.6	17.0
Mazowieckie	19.0	18.5	18.2	17.9	20.2	19.5	18.8	18.1	18.7	18.6
Opolskie	20.7	19.7	17.6	18.6	20.5	26.4	26.5	21.3	20.4	21.5
Podkarpackie	24.4	28.5	26.3	23.9	22.5	21.0	18.6	19.0	20.5	20.5
Podlaskie	22.0	25.8	22.0	20.7	24.3	23.9	18.5	20.3	21.5	22.3
Pomorskie	21.5	20.9	21.6	19.6	20.8	21.7	19.5	20.1	19.4	16.6
Śląskie	18.3	19.1	17.2	17.1	17.4	17.0	16.8	16.1	16.6	17.1
Świętokrzyskie	24.0	22.1	21.1	16.7	16.4	18.1	14.0	14.4	14.8	15.3
Warmińsko-Mazurskie	22.6	24.5	23.2	19.2	19.7	22.4	19.8	19.1	21.8	19.2
Wielkopolskie	19.5	19.4	19.3	16.7	18.8	19.8	18.4	16.9	17.4	17.6
Zachodniopomorskie	19.9	19.9	21.5	23.5	21.5	21.4	16.2	18.0	18.9	17.8

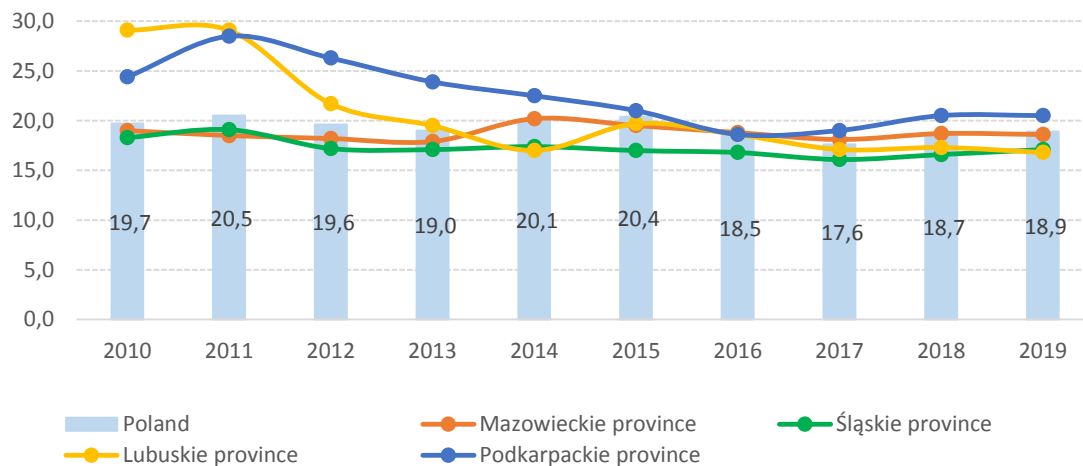
Source: own study based on the Local Data Bank, Central Statistical Office and the Macroeconomic Data Bank of the Central Statistical Office, access on 20.09.2022.

In provinces characterized by stronger economic potential (Dolnośląskie, Mazowieckie, Śląskie, Pomorskie), the investment rate remained at a lower level compared to all provinces, while this level was stable. The provinces in which the economy is assessed as weaker (Lubuskie, Podkarpackie, Świętokrzyskie) were characterized by significant fluctuations in the level of the analyzed indicator and, as a rule, a decrease in the value of the indicator in 2010-2016. In some provinces (Opolskie, Podlaskie, Zachodniopomorskie) the years 2014-2016 were characterized by the highest values of the investment rate.

In the period 2016-2019, the investment rate in the national economy also remained at a stable level, despite the fact that the volume of investment outlays in the public sector, as indicated earlier, was clearly increasing. It should be noted, however, that public investments generated only a part of the analyzed indicator, which was about 1/3 of the value of the indicator for the national economy, while the remaining part depended on the activity of private sector entities<sup>1</sup>. According to the data published by the Macroeconomic Data Bank of the Central Statistical Office, from 2020 there was already a noticeable decrease in the value of the

<sup>1</sup> According to data from the Macroeconomic Data Bank of the Central Statistical Office, 28.10.2022.

investment rate in the public and private sectors, and in terms of the entire national economy, the investment rate amounted to 18.3%. The impact of the crisis phenomena was clearly visible in 2021, when the investment rate in the national economy stood at 17.0%, and separately in the public sector at 5.7%. It should be emphasized that changes in the streams of external investment capital transferred from the EU budget, observed in this period, were of significant importance here. On the other hand, also important for the course of changes in the examined indicator were changes in the level of GDP achieved in the scale of the entire national economy, as well as in regional terms, in the areas of individual provinces.



**Figure 4.** Investment rate in the national economy in Poland and in selected provinces in 2010-2019 (in %).

Source: own elaboration based on data from table 2.

Bearing in mind the diversity of entities and organizational units of the public sector, undertaking public investments, it is also worth pointing to investment expenditure financed by the government subsector at the level of provinces. Investment expenditure related to financing the tasks of the government subsector are of a specific nature and are related to the implementation of tasks that are aimed at providing public services at the state level, and therefore they may be public expenditure related to internal security, external security, health protection, social policy or other objectives, the implementation of which takes place in individual regions and is financed at the government level.

As shown in Table 3, in the years 2010-2020 the government subsector undertook diversified investment activity in the territorial breakdown of individual provinces. The largest amount of funds was spent in the Mazowieckie province, where in 2010-2020 the level of expenditure was between PLN 8.0 billion and PLN 15.8 billion. The volume of investment expenditures of the government subsector in the Mazowieckie province was significantly shaped by financing investments in the field of road and rail transport, which were largely related to the role of the capital city of Warsaw and resulted from the geographical location of the Warsaw agglomeration and transport accessibility in relation to the diverse functions that the city performs towards the needs of the whole country.

**Table 3.**

*Total value of capital outlays in the government sub-sector broken down by provinces in 2010-2020 (in PLN billion)*

Specification	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Dolnośląskie	5.2	5.7	3.7	3.1	3.0	4.2	3.5	2.9	4.0	2.8	2.8
Kujawsko-pomorskie	1.3	3.6	2.0	1.8	2.0	4.6	1.6	1.5	2.4	2.5	2.7
Lubelskie	1.9	2.8	2.9	2.4	1.6	2.2	1.2	1.8	2.4	3.6	3.9
Lubuskie	1.3	4.3	2.2	1.6	1.1	1.4	1.1	0.9	1.1	0.9	1.4
Łódzkie	4.4	6.9	6.3	5.2	3.2	3.5	1.6	1.7	1.7	3.0	3.7
Małopolskie	3.1	3.8	5.4	4.1	4.4	5.3	3.1	2.6	4.6	5.0	4.9
Mazowieckie	8.0	9.2	11.2	10.4	11.5	15.8	13.2	10.9	12.4	12.9	13.0
Opolskie	0.9	0.7	0.6	1.1	1.0	0.9	0.7	0.5	1.2	1.3	1.6
Podkarpackie	3.0	5.1	4.9	3.6	2.3	2.2	2.2	1.4	1.8	2.7	3.4
Podlaskie	0.8	1.0	1.2	1.4	2.0	1.7	0.7	1.1	1.0	1.7	2.5
Pomorskie	4.1	3.9	3.8	3.8	4.1	4.8	5.1	3.5	6.7	3.9	5.5
Śląskie	8.0	9.3	8.0	7.1	7.4	6.3	6.4	6.9	6.7	8.2	9.9
Świętokrzyskie	1.4	1.3	1.2	0.6	0.6	1.4	1.2	0.5	0.5	1.1	1.3
Warmińsko-mazurskie	1.8	2.9	3.1	1.7	1.4	2.4	2.8	1.9	2.3	1.7	2.2
Wielkopolskie	3.4	4.6	5.2	3.5	4.0	4.3	3.2	3.6	4.6	5.1	4.0
Zachodniopomorskie	2.8	3.0	3.9	3.6	4.2	3.2	2.4	2.9	3.2	2.9	4.6

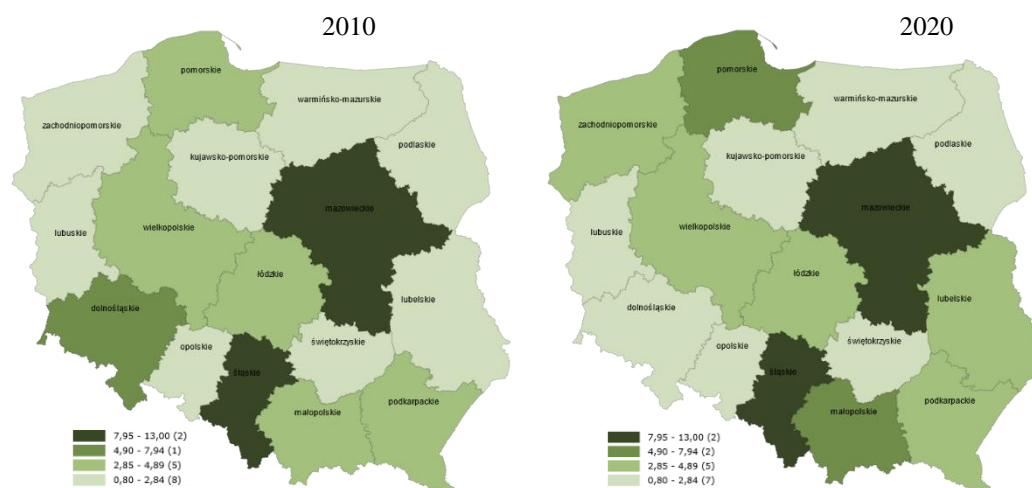
Source: own study based on the Local Data Bank, Central Statistical Office, 20.09.2022.

In the remaining provinces, that kind of expenditure were at various levels. Relatively high expenditure was recorded in the Śląskie province and in the Wielkopolskie, Małopolskie and Łódzkie provinces. There is a regularity in this case, consisting in increasing investment outlays in regions with a low level of socio-economic development. Comparing investment expenditure in the years 2010-2020, there are noticeable fluctuations in the level of government subsector expenditure in less developed provinces, but also clear periods of increase in the amounts spent in the years 2010-2013 and especially in the years 2017-2020. In 2020, over PLN 3.9 billion was spent in Lubelskie province, which was also the maximum amount of expenditure in the period under review, while in 2010 the amount of government subsector expenditure in this province amounted to PLN 1.9 billion. A similar situation took place in the Podkarpackie province, where PLN 3.4 billion was spent in 2020, which was an increase compared to the expenditure incurred in previous years from 2017, although it should be noted that in 2010 expenditure amounted to PLN 3.0 PLN billion, and their maximum value for the analyzed period, i.e. PLN 5.1 billion, was recorded in 2011. A similar situation occurred in the Podlaskie and Warmińsko-Mazurskie provinces.

In provinces of a higher level of development, investment outlays financed from government funds were at a relatively high level, but they were characterized by a clearly lower growth rate of these expenditures in the period 2017-2020. This mechanism of financing tasks from government funds can be considered an element of the cohesion policy, according to which attempts are made to eliminate differences in the level of socio-economic development of provinces and government funds are allocated for these purposes.

Changes recorded in the years 2010-2020 in terms of the level of investment expenditure under government funds are illustrated in Figure 5, which presents the results of calculations regarding investment expenditure in 2010 and in 2020. The graphic illustration shows changes

in the directions of financing investments at the central government level in the territorial breakdown, which have been mentioned and there is a clear increase in investment expenditure in provinces of high dynamics of economic development, such as Małopolskie, Dolnośląskie and Pomorskie. Mazowieckie and Śląskie provinces invariably occupied a dominant position in terms of the level of government subsector expenditure.



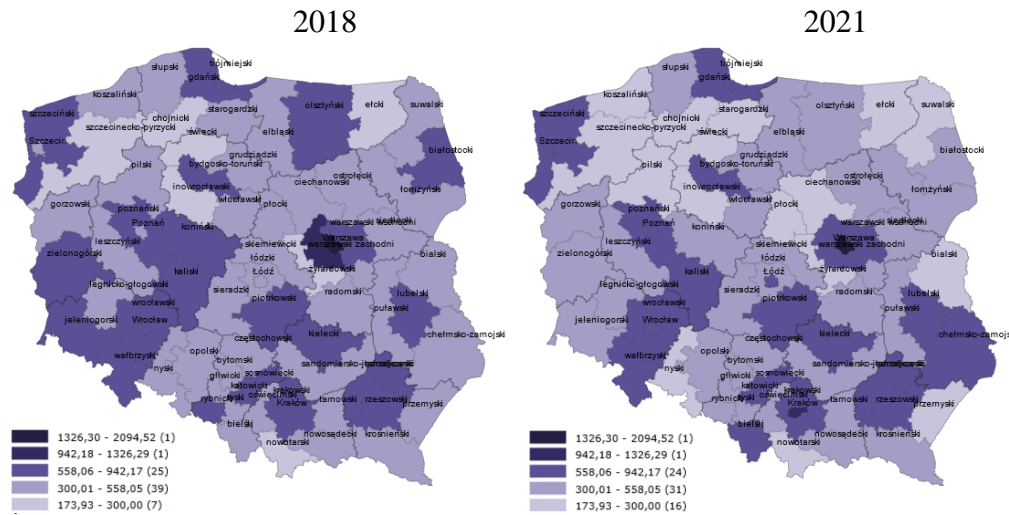
**Figure 5.** Total investment outlays in the government sub-sector by voivodships in 2010 and 2020 (in PLN billion).

Source: own study based on data from the Knowledge Bases - Atlas of Regions, <http://swaid.stat.gov.pl/SitePagesDBW/AtlasRegionow.aspx>, 21.10.2022.

An increase in investment expenditure was also observed in provinces with a lower level of economic development, such as Lubelskie or Zachodniopomorskie. As mentioned earlier, the funds allocated for investments within central government resources are aimed at implementing investment projects that would allow to eliminate differences or even reduce disproportions in the level of socio-economic development through investments supporting these processes. The category of government expenditure includes investments strictly related to improving the condition of the economy, such as investments in the energy sector, but also investments related to the construction of basic infrastructure components. The above-mentioned provinces, due to various, including historically shaped conditions, were characterized by a lower level of infrastructural development. Therefore, it is reasonable to incur higher investment outlays in order to reduce the existing disparities.

In addition to financial resources from government sources, funds from the budgets of local government units at the local and regional level, as well as funds from business entities of the private sector, were also allocated for investment purposes. An extension of the analysis in the provinces breakdown can therefore be the study of investment expenditure from the budgets of municipalities, which for the purposes of the study have been aggregated to the level of subregions (NUTS 3). Such a formula made it possible to present the research results in the form of choropleth maps in Figure 6. During the research, the full range of data on such expenditure was aggregated and analyzed, but the graphical presentation focused on the results

for 2018 and 2021. This was to illustrate the situation that took place before the occurrence of the crisis phenomena related to the COVID-19 pandemic and also the most current (in terms of availability of data for the full annual period) situation observed in 2021, when the economy was significantly slowed down administratively due to the ongoing pandemic.



**Figure 6.** Investment expenditure of municipalities' budgets aggregated by subregions (NUTS 3) in 2018 and 2021 (in PLN million).

Source: own study based on data from the Knowledge Bases - Atlas of Regions, <http://swaid.stat.gov.pl/SitePagesDBW/AtlasRegionow.aspx>, 21.10.2022.

The results of the research indicate a noticeable decrease in investment outlays carried out by municipalities in the western and north-eastern areas of Poland. It was possible to maintain the level of expenditure mainly in the central and south-eastern subregions, including those surrounding the main urban agglomerations and covering the largest cities, such as Łódź, the Tri-City subregion and also Warsaw, which stood out against the background of the country with a significantly higher level in the examined expenditure category. In addition, also in large cities such as Poznań, Kraków and Szczecin, an increase in investment outlays was recorded between 2018 and 2021. An increase in the level of investments financed from municipalities' budgets was also found in Bielski subregion and in Chełmsko-Zamojski subregion.

The total results of the analysis, covering the years 2010-2021, allow to conclude that in the analyzed period, in the areas of all the examined provinces, although with varying intensity, activities were carried out to support economic development and reduce significant development barriers in changing economic conditions. The observed streams of investment outlays related to the implementation of public tasks should be assessed as the result of various forms of planning and evaluation of investment programs and projects undertaken earlier, as well as developing the ability to adapt to changes in the external environment and using the development potential determined by endogenous factors in various territorial dimensions. In the modern market economy, it is expected that despite the changing macroeconomic conditions, public investments will be characterized by a fixed scope of availability and an accepted level of quality. Striving to meet social needs in the conditions of economic crises

requires adapting management methods in the public sector at the state level and in the regional and local economy, including the search for solutions to improve the efficiency of using even more limited investment funds.

#### **4. Conclusion**

Both theoretical research and the collected empirical material prove that investments in the public sector in the conditions of crisis phenomena are an important factor in stimulating socio-economic development, as well as mitigating the effects of crisis. The results of empirical research have revealed that there are various changes in the spending of public funds, especially budgetary funds of local government units, as well as funds from the state budget resources. Despite the earlier crisis phenomena, as well as the currently high economic instability, entities classified as part of the public sector at the central, as well as at the regional and local level, have carried out a significant range of investment activities. Thus, they strengthened their role as an important participant in economic processes, co-responsible for stabilizing development processes and improving the living conditions and economic activity of local communities.

As a result of the research, which covered the years 2010-2021, it was established that the national economy maintained a stable level of investment expenditure. The scope of expenditure covered the implementation of public objectives, i.e. it was the effect of the activity of entities and organizational units of the public sector, although it should be emphasized that it reflected development processes in the enterprise sector to a greater extent. The obtained research results showed that despite clear changes in the economic situation in Europe in the last decade, relatively favorable conditions for conducting business activity were observed in the market economy in Poland, as well as intensive investment activity of public sector entities at various territorial levels.

Considering the consequences of crisis phenomena, especially when it is still difficult to determine the depth of negative changes caused in the economy and in enterprises, a serious problem is the willingness to finance investments in the private sector, which reacts quickly to macroeconomic changes. The COVID-19 pandemic and the war in Ukraine, overlapping certain effects, caused a deterioration of the economic situation on a global scale on an unprecedented scale. This type of crisis is rated as one of the biggest in almost 80 years. This means that far-reaching adjustments should also be expected in the area of private investment. It may therefore turn out that maintaining the ability to finance public investments will be a key factor stabilizing the national economy in Poland. However, it should be remembered that solutions that increase public spending in times of crisis should always be of a temporary nature due to the increase in the budget deficit and, consequently, also public debt, which will also have an impact on the economy in later periods, after the above-mentioned phenomena caused by crises subside.



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