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Between Convergence and Divergence. The Spatial Dimension of Economic Development in Communist Poland (1950–1989)

Między zbieżnością a rozbieżnością. Przestrzenny wymiar rozwoju gospodarczego w komunistycznej Polsce (1950–1989)

Abstract

An important goal of communist economic policy was common and mass industrialization oriented on minimizing developmental inequalities between regions. Thus, the goal of this paper is to examine whether the modernization efforts of the Communist Party reduced (as planned) or rather exacerbated the economic inequality between regions. The authors use the existing data on regional income and employment structure to reconstruct the spatial structure at the voivodeship level. They use the 1976–1997 administrative division (49 small voivodships) and project backward estimates of regional income using data on employment structure and population. The results confirm regional convergence between 1950 and 1986. It was correlated with rapid growth in investment spending. The decreasing regional economic disparity between 1976 and 1986 was also related to the 1975 administrative reform. But, as the authors point out, the results confirmed, that in comparison with Western European countries the dynamics of convergence, and thus the scale of inequality reduction in Poland was only comparable to developed capitalist countries.

Keywords: Regional Development, Communist Poland.
JEL: N14, N94

Streszczenie

Istotnym elementem komunistycznej polityki gospodarczej było uprzemysłowienie, którego celem było między innymi zminimalizowanie nierówności rozwojowych między regionami. W niniejszym artykule zbadano, czy wysiłki modernizacyjne partii komunistycznej w Polsce zmniejszyły, czy też pogłębiły nierówności ekonomiczne między regionami. Posługując się istniejącymi danymi na temat regionalnej struktury dochodów i zatrudnienia, autorzy rekonstruują strukturę przestrzenną dochodu narodowego na poziomie województw. Autorzy szacują dochód regionalny na poziomie 49 województw bazując na podziale administracyjnym z lat 1976–1997 w oparciu o strukturę zatrudnienia i liczbę ludności. Wyniki wskazują na konwergencję regionalną w latach 1950–1986 korelującą z szybkim wzrostem wydatków inwestycyjnych. Zmniejszające się regionalne dysproporcje gospodarcze w latach 1976–1986 były również związane z reformą administracyjną z 1975 roku. Autorzy zauważają jednak, że w porównaniu z krajami Europy Zachodniej, dynamika konwergencji i skala redukcji nierówności w Polsce były porównywalne jedynie z rozwiniętymi krajami kapitalistycznych, w których wyjściowy poziom regionalnych nierówności był zdecydowanie niższy.

Słowa kluczowe: rozwój regionalny, komunistyczna Polska.
JEL: N14, N94

1. Introduction

Long-term regional development is currently one of the most important topics analysed by economic historians. Levels of GDP and regional economic growth show regional inequalities within national economies. In our study, we address the problem of convergence between regions in communist Poland between 1950 and the second half of the 1980s. Our study uses estimates of regional income for 49 Polish voivodeships (corresponding to the administrational division introduced in 1975), the first such estimate for the period of communist rule in Poland.

Regional development is a result of industrialisation, urbanisation and various factors usually described as a first nature geography. As a result, there are regional differences in per capita output, income and living standards. In Poland, such regional differences were clearly visible as early as the 19th century (Bukowski et al., 2017, 2018, 2019), while in the interwar period they became an important area of interest for economists and one of the main elements of state economic policy. One of the researchers working on this topic was Eugeniusz Kwiatkowski (1931), who in the early 1930s came up with the concept of structural inequality between better and less developed parts of Poland (division into Poland A and B).[1] A few years later, Kwiatkowski, as Deputy Prime Minister, was a co-author of the Central Industrial District project, which focused on reducing these inequalities (see Drozdowski, 2015). The programme was discontinued due to the outbreak of war, making it impossible to assess whether its implementation would have yielded positive results.

After World War II and the communist takeover, policies aimed at levelling regional disparities were introduced as a natural result of the ideological tenets of Marxism-Leninism. Egalitarianism was one of the pillars of the new political and economic system (at least in propaganda). Therefore, regional convergence become one of the goals of regional policy.

Economic policy during the communist period was also focused on socio-economic modernisation, reflected in rapid industrialisation and an increase in the size and importance of the working class. As a result, the state expanded factory industry throughout almost the entire period until 1989. However, the intensity of investment policy fluctuated. Investment spending was high in relation to national income in the 1950s and the 1970s, but relatively low in the 1960s, stagnating, or even declining, in the 1980s during the period of economic crisis. Prandecka (1969) suggested that the expansion of industry helped reduce the development gap between regions, thus leading to regional convergence. A second element of the communist policy affecting regional convergence was the 1975 administrative reform. This resulted in a new administrative division: instead of the former 17 voivodeships (and five cities), the country was divided into

[1] According to Andrzej Gawryszewski, three categories (rather than two) can be distinguished in the interwar period: Poland A, B and C. The least-developed Poland C (agricultural areas, practically without any industry) included the northern and central parts of the Eastern Borderlands. Poland B included mainly agricultural areas with little industry: the provinces of Lublin, Lviv, Stanislawow, Tarnopol and the eastern parts of the provinces of Krakow and Kielce. Poland A included industrialised areas: the provinces of Warsaw, Silesia, Lodz and Pomerania, as well as the remaining regions of the Kielce and Krakow provinces (Gawryszewski, 2005, pp. 33–34).

49 newly drawn ones. As a result, the medium-sized capitals of new voivodeships began to develop more (see Bartoszewicz et al., 2017; Kurniewicz et al., 2023).

Our analysis indicates that the communist period did indeed manage to reduce the differences in economic development between regions, though these changes occurred in various dynamics. We also confront our results with analyses of regional disparities in capitalist countries (Roses and Wolf, 2019). Our results show that, despite egalitarianism being one of the pillars of the communist system, there is no clear evidence that the regional convergence process in Poland was any faster than in the countries of Western Europe.

The study is based on an analysis of regional income per capita (i.e. national income calculated for the voivodeships) for five years: 1950, 1960, 1970, 1976 and 1986. The category of national income used in official statistics during the socialist era, and applied in this work, follows the Marxist methodology of Material Product Indicators. It is calculated with the exclusion of an important part of the service sector, namely intangible services. As a result, the estimates of national income per capita cannot be compared directly with estimates of GDP per capita. The level of intangible services in socialist economies varied between 10 and 15 per cent, but they were not distributed evenly across the regions. A regional snapshot of the level of these services was calculated by Statistics Poland only for 1986 (GUS, 1986).

This paper is divided into seven parts. After Introduction, in the second part we outlined the state of regional development research in the world and describe Polish attempts to analyse economic development at a regional level, including the study of regional economic inequalities in communist Poland. In the third part, we discuss the method of converting data to the level of 49 voivodeships for the period before 1975, along with the method of analysis used in the study of regional inequalities. In the fourth part, we discuss the evolution of economic policy in communist Poland, in particular the industrialisation process, outlining the principles of the 1975 administrative reform. The fifth part sets out the results of the study of economic convergence and divergence in the People's Republic of Poland. In the sixth part we verify the reliability of our method of estimating the regional national income. In the Conclusions, we summarise the results of the analysis.

2. An overview of research into regional economic development in economic history

Studies of regional economic development and regional economic inequality have long been carried out in economic history (see Law, 1980). However, in the last two decades, they have become one of the more popular topics. Crucial to the development of this research was the pioneering work of Frank Geary and Tom Stark addressing the problem of regional development in Ireland (2002). These authors analysed regional economic growth following the potato blight in the 1840s, and then the regional GDP of Great Britain for the years 1871–1911 (Geary and Stark, 2002, 2015, 2016).

Geary and Stark's studies sparked a wave of interest in research on regional GDP and regional economic inequality, sometimes using quite different estimation methods

(not necessarily the Geary and Stark method) depending on the availability of data. In the past two decades, there have been a number of publications on the regional development of various countries in different historical periods. These include works on Austria-Hungary in the second half of the 19th century and early 20th century (Schulze, 2007), an estimation of Swedish regional GDP from 1571 to 1850 (Enflo and Missiaia, 2018) and a similar work on Italy in the period 1891–2001 (Danielle and Malanima, 2014). A form of summary of these studies for many countries of Western and Southern Europe and the United States is the book and database edited by Roses and Wolf (2019), which includes estimates of regional GDP covering the period 1900–2010.

Such regional estimates of long-term economic growth do not exist for Eastern European countries, including Poland. The only exception, to the best of our knowledge, is Nikolaus Wolf's estimates for Germany, which include data for the regions of former East Germany after World War II (Wolf, 2019). However, researchers have analysed the economic situation of regions over shorter periods, including the impact of Communist governments' policies on the economic situation of these regions, as exemplified by Andrei Markevich and Ekatarina Zhuravskaya's study devoted to analysing the impact of Khrushchev's Sovnarkhoz reform on the economic situation of the Soviet regions (Markevich and Zhuravskaya, 2011). The lack of long-term analyses of regional economic growth for Poland does not mean that these issues have not been addressed by Polish historians. There have been attempts to show regional growth disparities in the short term, or at selected moments in history, as in the publication by Bukowski et al. (2017) devoted to regional development at the turn of the 20th century, or in short-term analyses of regional development in communist Poland (Koryś and Tymiński, 2022a, 2022b).

The issue of regional development in Poland has also been analysed by economic geographers. The first analyses of regional development in communist Poland were conducted as early as the 1950s. The pioneer in this was Stanislaw Berezowski, author of several works and also influential in Polish economics (see Berezowski, 1964). A significant body of work was produced in the 1960s and 1970s, encompassing both general and theoretical works (see Dziewoński, 1967; Domański, 1982) as well as empirical analyses of specific issues. In particular, Antoni Kukliński (1962) and Stanislaw M. Zawadzki (1965) studied the spatial structure of industry. Stanislaw Misztal focused on the structure of Polish industry in the long period from the second half of the 19th century (Misztal, 1970), and on urbanisation and the evolution of the occupational structure in the period from the beginning of the Polish People's Republic (Misztal and Kaczorowski, 1979). Data collected by Misztal and Kaczorowski are used in our study.

Barbara Prandecka (1969) published noteworthy monographs on regional economic growth by province for the years 1950–1965; the measure of economic development she used was regional income. In her work, Prandecka studied the relationship between economic growth and numerous socioeconomic parameters. As a result, she identified, among other things, the significant impact of investment on economic growth. She indicated that, in 1950–1965, investments in less developed regions were higher than in well developed ones. According to her results, this led to regional convergence.

After the collapse of the communist system in 1989, researchers' interest in regional development issues increased, but with more of a focus on the impact of the economic transition on regional development (see Wójcik, 2004, 2008; Kociszewski, 2005). Despite decreasing interest in regional differences during the communist period, several analyses devoted to this topic have been published (Kociszewski, 1999; Koryś, 2018). However, neither during the communist period, nor after its collapse, have there been any studies devoted to the analysis of regional economic growth and regional inequality throughout the entire period of communist rule in Poland. In this sense, our study fills an important gap in the knowledge of the economic changes that took place in Poland after World War II.

3. Econometric model

The aim of the analysis is to estimate the distribution of national income across the regions of Poland for the years 1950–1986 (we use the term regional income to describe this measure), using an econometric approach based on regional indicators. The available data reflect a unique situation, where the administrative division of Poland changed from 22 regions in 1950–1975 to 49 regions in 1976–1986. Therefore, for the years 1960, 1965, 1970 and 1973 we have regional income (RI) data for 22 regions, while for the years 1976 and 1986 data is available for 49 regions, due to the administrative reform (GUS, 1969, 1972, 1974, 1975, 1979, 1989). However, the results were never published simultaneously for both administrative divisions.

At the same time, we have consistent data stretching over the entire period for the total population, urban population and industrial employment, divided into 49 regions for 1950, 1960, 1970, 1973, 1976 and 1986. We were in the advantageous position of having data on regional income by administrative division prior to the 1975 reform for 1960 and 1970, while population and urbanisation data in the 49 voivodeships were compiled from censuses carried out by Misztal and Kaczorowski (1979) for the years 1950, 1960, 1970. The statistical yearbook for 1974 contains population data for both the old and new administrative division (1975). This allows us to: (1) disaggregate the regional income data of 1960 and 1970 from 22 to 49 regions, and (2) estimate the regional income for the year 1950.

In order to do this, we use population POP_i, industrial employment $EMP_{IND,i}$ and urban population $POP_{URB,i}$ as explanatory variables to estimate the regional income $Y_{REG,i}$. First, a regression model is estimated using the available data for 22 regions for 1960, 1965, 1970 and 1973. Then the estimated elasticities, together with the data on the independent variables for 49 regions and for 1950, 1960, 1970 and 1976, are used for disaggregation purposes. The log-log relationship provides a useful tool by which to measure elasticities and minimise heteroscedasticity in the data. Thus, the regional income is modelled using the following econometric equation:

$$\ln\left(\mathrm{Y_{REG,i}}\right) = \alpha + \beta_1^X \ln\left(\mathrm{POP_i}\right) + \beta_2^X \ln\left(\mathrm{X_i}\right) + \epsilon_i \tag{1}$$

Where index $i \in \{1,\ldots 22\}$ represents the regional division and X_i is an independent variable that could be either industrial employment $EMP_{IND,i}$ or urban population $POP_{URB,i}$ in a given region. This regression is estimated using the OLS method for

each year separately, before being applied to the 1950, 1960, 1970 and 1973 regional data to infer a 49-region split of domestic income in those years. In other words, once the parameters are estimated for the years 1960, 1970 and 1973, we apply the estimated coefficients to the corresponding variables for 1950, 1960, 1970 and 1973, but in the 49-region division. Specifically, using the same relationship as above, we estimate the regional income for each of the 49 regions, ensuring consistency with the underlying economic structure captured by the model. The estimated model for the disaggregated 49-region income is given by:

$$\widehat{Y_{REG,j}} = e^{\alpha} \cdot \left(POP_j\right)^{\beta_1^X} \cdot \left(X_{IND,j}\right)^{\beta_2^X} \tag{2}$$

Where index $j \in \{1,\ldots 49\}$ represents the regional division into 49 regions. For each period, we use the coefficients β_1^X and β_2^X closest in time, i.e. from the 1960 model for 1960 disaggregation and from 1970 and 1973 for the 1970 and 1973 disaggregations respectively. To estimate the regional income for the year 1950 at the 49-region level, we assumed that the relationships established in 1960 were also valid in 1950 and could be applied to the data from 1950 for population, industrial employment or urban population in the 49-region framework. We tested the robustness of the applied method by comparing the resulted estimates of regional product dynamics using two estimated models. The obtained results were similar to each other, indicating that it is possible to use the derived regional income growth rates to extrapolate the division of regional income from 1976 (49 regions) back to the years 1950, 1960 and 1970. These estimates of regional income allow us to analyse the convergence between Polish regions across the majority of the existence of the Peoples Republic of Poland, i.e. for the 1950–1986 period. The results presented in the paper rely on the industrial employment model.

Table 1.
OLS regression estimates of regression coefficients

Industrial employment model					**Urbanisation model**				
1960									
	Coeff.	***Std dev.***	***t Stat***	***p-value***		***Coeff.***	***Std dev.***	***t Stat***	***p-value***
Alpha	3.62	0.48	7.54	0.000	**Alpha**	3.12	0.49	6.39	0.000
POP	0.65	0.10	6.60	0.000	**POP**	0.42	0.07	5.74	0.000
EMP_IND	0.35	0.06	5.77	0.000	**POP_URB**	0.60	0.08	7.20	0.000
1970									
	Coeff.	***Std dev.***	***t Stat***	***p-value***		***Coeff.***	***Std dev.***	***t Stat***	***p-value***
Alpha	3.34	0.45	7.37	0.000	**Alpha**	3.70	0.54	6.85	0.000
POP	0.68	0.10	6.59	0.000	**POP**	0.27	0.08	3.22	0.005
EMP_IND	0.40	0.07	5.70	0.000	**POP_URB**	0.73	0.10	7.50	0.000
1973									
	Coeff.	***Std dev.***	***t Stat***	***p-value***		***Coeff.***	***Std dev.***	***t Stat***	***p-value***
Alpha	3.15	0.69	4.56	0.000	**Alpha**	3.68	0.48	4.25	0.001

Industrial employment model					Urbanisation model				
POP	0.74	0.16	4.47	0.001	**POP**	0.37	0.14	5.76	0.000
EMP_IND	0.40	0.12	3.43	0.004	**POP_URB**	0.66	0.11	3.74	0.002

Source: own calculation based on GUS (1969, 1972, 1974, 1979, 1989); Misztal and Kaczorowski (1979).

The procedure involves estimating log-linear regressions for the 22 regions using historical data for 1960 and 1970, then applying these relationships to estimate the income distribution at the 49-region level for 1950–1970. This method allows us to maintain consistency in estimates of regional income across different administrative boundaries, while ensuring coherence in regional economic analyses over the decades.

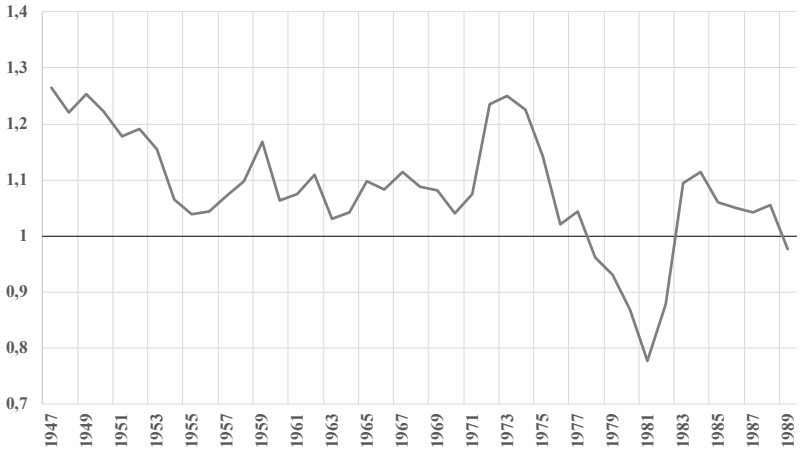
In the case of two voivodeships – Bielsko-Biała and Płock – it was necessary to determine the level of regional income per capita for 1950 and 1960 in a different way. In 1976, the level of regional income per capita in these provinces was clearly higher than the demographic data suggested. This was related to the establishment of industrial enterprises that produced high value-added products (as shown in the Statistical Yearbooks) on a scale that affected the level of regional income per capita. In the case of Płock voivodeship, this was related to the development of a large refinery, while in the case of Bielsko-Biała voivodeship it concerned the development of car production (and the FSM enterprise, which had a significant impact on the industrial structure of the region). We assumed that the level of regional income per capita for the Bielsko-Biała voivodeship in 1960, before the launch of FSM, was comparable to the level of regional income per capita in voivodeships with a similar level of industrial labour force (LF) in 1950: Poznań and Jelenia Góra. We assumed that the level of regional income per capita in the Plock voivodeship in 1960, before the start of production in the refinery, was at a similar level to that of the rural provinces of western/central Mazovia and the former Łódź voivodeship, represented by Sieradz and Skierniewice.

The dynamics of national income per capita growth presented in official data are far higher than the dynamics of Polish GDP as estimated in the Maddison Project database (cf. Bolt and Van Zanden, 2024). In this paper, we used official data reflecting the dynamics reported by Statistics Poland.

4. Overview of the regional industrial policy and economic development of communist Poland

Between 1950 and 1986, the socialist economy experienced four phases of economic development. This was reflected in the dynamics of investment expenditure (Fig. 1). Two periods of accelerated fiscal expansion can be indicated – intensive industrialisation during the Stalinist period and the "investment boom" of Edward Gierek in the first half of the 1970s. The rate of growth of investment spending exceeded 20% in the peak years of the cycles. By contrast, during the period of Wladyslaw Gomulka's rule in the late 1950s and 1960s, the dynamics of investment expenditure declined. In the late 1970s and 1980s, the dynamics of investment spending first collapsed to very low levels before stabilising after a partial recovery, as shown in Figure 1.

Figure 1.
Investment expenditure dynamics y/y (previous year = 1)



Note: Prices were recalculated to 1984 levels based on chained indexes. In order to smooth the series, the data for 1949 and 1950 were adjusted. According to the original data, investment growth in these years was as high as 40%, which was probably related to the way the 1946–1949 Plan and the 1950–1955 Plan were accounted for. There is no convincing argument for a one-time surge in investment in 1950, especially as the dynamics were much lower before and after that year.

Source: Koryś and Tymiński, 2021.

The first phase of economic development in postwar Poland (until 1956) can be divided into two sub-periods. The first covered the years spent reconstructing the economy, from the end of WWII until the end of the Three-Year Plan (1947–1949) (see Kowalik, 2006; Kaliński, 1977). The period of implementing the Six-Year Plan (1950–1955) resulted in the Stalinisation of the Polish economy. The industrial policy of the 1950s was based on high internal accumulation at the expense of stagnation or decline in real wages. In addition, a significant portion of citizens' savings was effectively captured by currency reform (see Bałtowski, 2009; Kaliński, 1987). In this period, the steel industry and the defence sector were developed mostly on the basis of Soviet technology. The rapid increase in capital expenditure was related to both the number and scale of new investments projects. At the same time, economic growth, particularly the growth in industrial production, did not have any significant affect on living standards (see Jezierski and Leszczyńska, 1997).

The outbreak of social discontent in 1956 ended this period (see Machcewicz, 1993). The growing wave of protests led to the appointment of a new party leader, Władyslaw Gomułka. He decided to change the country's economic policy and temporarily shifted the relationship between accumulation and consumption (Jezierski and Leszczyńska, 1997). Due to the very limited possibility of external credit for development, this shift resulted in a decline in the rate of growth of investment expenditure in the late 1950s (see Fig. 1).

The return to a policy of industrialisation in the 1960s resulted in an increase in the accumulation rate. As capital expenditure relied almost entirely on limited

domestic resources, investment spending grew at a lower rate than in the early 1950s, with dynamics rarely exceeding 10% (see Fig. 1). The slow growth of investment spending, along with the lack of a clear vision for economic policy or the reform of the economic system (Kaliński, 2011), resulted in lower economic growth and further very slow dynamics of improvements in living standards.

An attempt to overcome these economic problems came in the form of the selective development programme introduced in 1969. This new policy was intended to result in accelerated economic growth and, in the long term, avoid a cyclical slowdown in investment and development (Dwilewicz, 2008). However, the capital expenditure was based on increasing accumulation, with part of the programme being a reduction in real wages. Gomulka's decision to raise meat prices was the direct cause of social protests that led to his downfall and Edward Gierek's seizure of power in December 1970 (see Eisler, 2012).

During the 1970s, the concept of accelerated industrialisation was revisited once again. Gierek rejected the concept of an investment policy based on increased accumulation. The new programme started from the premise that the industrial policy should coincide with an increase in living standards (Dwilewicz, 2011; Tymiński, 2022; Tymiński and Koryś, 2025). External loans were the primary source of financing for new investment projects, and the development strategy included both the expansion of heavy industry and sectors producing consumer goods, along with the introduction of new technology from the West (see Fallenbuchl, 1983).

In addition to the new economic policy, an important change introduced by Gierek that affected regional development was the reform of the country's administrative division. In 1975, the existing 17 voivodeships were replaced with 49, establishing a group of medium-sized and small cities as their capitals. Some researchers have pointed out that this reform mirrored the French departmental system, which came under fire for its inefficiency (Kukliński and Swianiewicz, 1990, p. 16). Some historians have claimed that Gierek's intention to weaken the regional lobbies and strengthen the position of the central power was the major political goal of this reform (Dudek and Zblewski, 2008, pp. 243–244; Kukliński and Swianiewicz, 1990, pp. 18). However, along with strengthening the central government, the reform also contributed to the growing importance of many medium-sized cities. The capitals of the new voivodeships began to develop faster, their populations often doubled over the next several years (see Bartoszewicz et al., 2017; Sokołowski, 2006; Kaczmarek, 1996; Prawelska-Skrzypek, 1992; Kurniewicz et al., 2023).

The result of Gierek's economic policy was the collapse of the national economy in the second half of the 1970s (see Kuczyński, 1981; Myant, 1982; Nuti, 1981). The scale of this collapse was reflected not only in the previously unobserved decline in the investment growth rate, which turned negative in the late 1970s, but also in a ramping up of foreign debt (Ząbkowicz, 1992). The economic collapse brought a wave of social unrest in August 1980. Further political dynamics resulted in the formation of the first independent trade union in any of the communist states – *Solidarność*, along with a change to the leader of the Communist party and the imposition of martial law by General Wojciech Jaruzelski in December 1981.

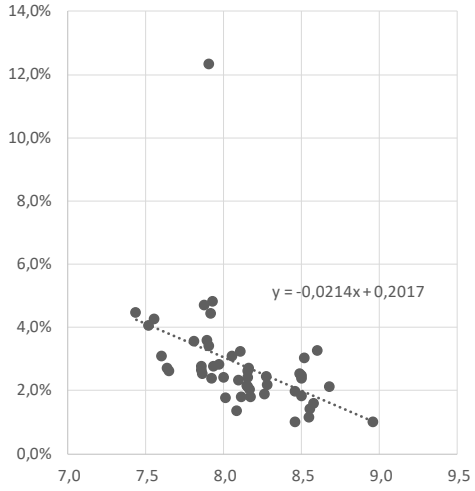
Jaruzelski's government only managed to bring the recession under control in 1983, but even at the end of the 1980s, Poland's economy was recording only modest economic growth or stagnation. The high debt burden and sanctions imposed on Poland after the introduction of martial law limited Poland's ability to obtain credit abroad. At the same time, unsuccessful reforms introduced during this period failed to provide opportunities for a restoration of sustained economic growth and accumulation (Grala, 2005). As a result, both investment spending dynamics and economic growth rates were very weak, as were indicators of living standards. This ultimately led to another wave of social unrest in 1988, culminating in the collapse of the communist system and the centrally planned economy in Poland in 1989.

5. Results and discussion

We examined the convergence and divergence between regions during the period 1950–1986. We analysed regional income per capita and the average annual growth of regional income per capita in four periods, corresponding roughly to the phases of economic policy described above.

Fiscal expansion was particularly evident in the first half of the 1950s. The economic policy was modified in the later years of this period, after the social unrest in 1956, but the entire decade can be regarded as a period in which attempts were made to rapidly industrialise the economy. The economic policy of the 1950s (especially the first half of the decade) was accompanied by economic convergence between the regions studied (Fig. 2). It can be assumed that the magnitude of the change would have been greater if the state had not reduced the dynamics of investment spending in the mid-1950s.

Figure 2.
Beta convergence. Log of regional income (RI) per capita for 1950 vs. average annual growth in 49 voivodeships (1950–1960)

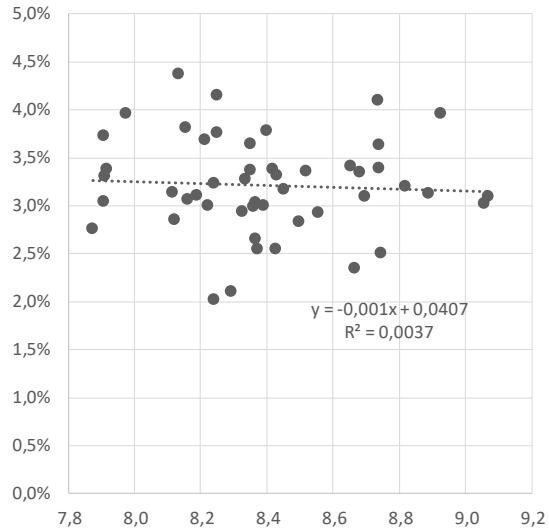


Source: own calculations based on data in the Tables in the Appendix.

In the 1960s, economic growth slowed down, accompanied by a slump in the convergence processes and a renewed increase in regional inequality. These trends are illustrated in Figure 3, which shows a divergence between the 49 regions studied. It is worth mentioning that the 1960s was the only one of the studied periods in which a divergence can be seen between the analysed regions.

Figure 3.

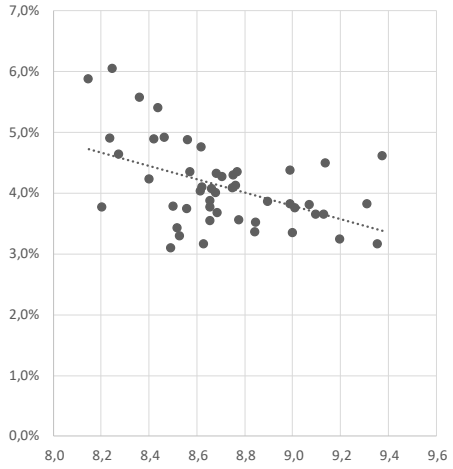
Beta convergence. Log of regional income per capita in 1960 vs. average annual growth of regional income (RI) per capita in 49 voivodeships (1960–1970)



Source: own calculations based on the data in the Tables in the Appendix.

The first half of the 1970s was a period of investment boom, a consequence of the development policy introduced under Edward Gierek's leadership. This policy resulted in dynamic economic growth in the country in the first half of the decade, exceeding 5% year-on-year at its peak (Tymiński, 2012). With regard to regional inequality, the investment boom again saw a change in trend, replacing the Gomulka-era divergence with convergence, the scale of which, given the length of the period, was the largest of all the economic policy phases under discussion. This process of narrowing the gap in economic development is demonstrated by in the period of economic convergence shown on Figure 4.

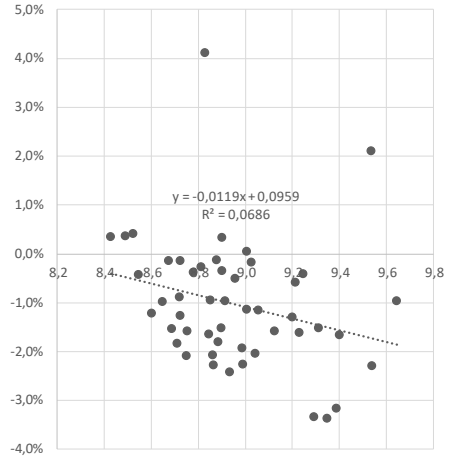
Figure 4.
Beta convergence. Log of regional income per capita in 1970 vs. average annual growth of regional income per capita in 49 voivodeships (1970–1976)



Source: own calculations based on data in the Tables in the Appendix.

The economic collapse leading to deep crisis in the second half of the 1970s resulted in recession and then in stagnation. In terms of regional inequality, this meant little change, although the relationship between regional income per capita and the growth rate of regional income per capita indicate a regional convergence (Fig. 5).

Figure 5.
Beta convergence. Log of regional income per capita in 1976 vs. average annual growth of regional income per capita in 49 voivodeships (1976–1986)

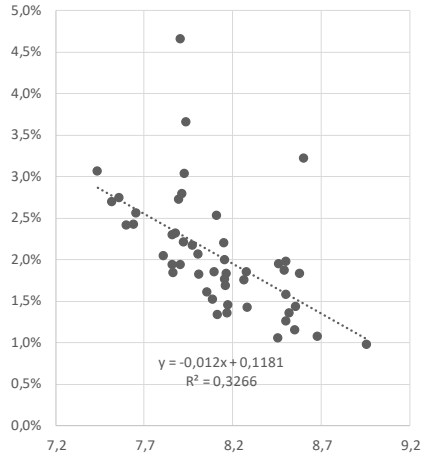


Source: own calculations based on data in the Tables in the Appendix.

The occurrence of convergence raises some doubts in light of the results for earlier periods, since convergence was accompanied by rapid industrialisation and a high rate of investment. In the period 1976–1986, this relationship was absent. An explanation may be the introduction of administrative reform which improved the situation of the new voivodeship capitals. Another consequence of the reform, which strengthened the centre, was the increased importance of Warsaw, whose regional income per capita increased significantly between 1976 and 1986 from 151.4% to 204.7% of the national average. Other highly developed voivodeships centred around large agglomerations generally declined: Łódź, Katowice, Gdańsk, Poznań and especially Kraków (see Table A1 in the Appendix).

Figure 6.

Beta convergence. Log of regional income per capita vs. average annual growth of regional income per capita in 49 voivodeships (1950–1986)



Source: own calculations based on data in the Tables in the Appendix.

The entire period under study, between 1950 and 1986, was characterised by considerable volatility in the state's activity, though there was regional convergence among the 49 regions, as indicated by the negative slope of the trend curve in Figure 6. Similarly, as illustrated by Figure 7, sigma convergence took place. In particular, this happened in the 1950s and during the first half of the 1970s.

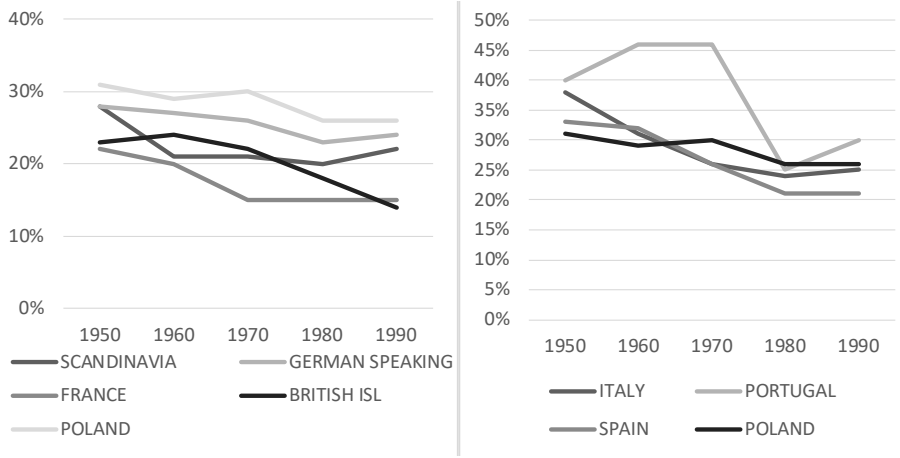
The processes of economic development in the regions and the regional convergence in the socialist communist economy lasted for more than 40 years (of which our analysis documents 36). This allows us to look at which regions benefited and which lost the most from the economic policies pursued during this period. Our results do not indicate that slow economic development (clearly below the dynamics of many capitalist countries with similarly developed economies at the outset) was compensated for by a particularly successful abolition of regional differences.

An exceptional example of success is the area of the Plock voivodeship. In the 1950s, as indicated by data on the structure of employment and urbanisation,

it belonged in the group of underdeveloped agricultural provinces of central Poland, but by the end of the People's Republic of Poland it found itself among the best developed. However, it owed virtually all of this success to one enterprise – Petrochemical Plants in Plock. Regional income in 1986 was more than five times higher than in 1950. Two more voivodeships had income per capita in 1986 more than triple what it had been in 1950 – Warsaw and Radom. In the case of Warsaw, the impact was due to war damage limiting the economic potential at the beginning of the analysed period and the success of post-war reconstruction. In the case of Radom, investments in the armaments industry and the construction of Poland's largest hard-coal-fired power plant (Kozienice) probably proved to be key factors. However, the official data for Radom for the period of 1976–1986 seems to be dubious, and we discuss this problem in more detail in the next section. The socialist economy also saw relatively rapid development in the agricultural provinces of central and eastern Poland, most of which achieved higher growth rates in regional income per capita than the average.

On the other hand, the industrialised voivodeships of the western and northern regions, most of which were within the borders of Germany before World War II (Jelenia Góra, Wałbrzych, Zielona Góra and Szczecin voivodeships), as well as urban voivodeships (Łódź, Kraków and Poznań), were characterised by very low dynamics of growth in regional income per capita. Surprisingly, the group of low-growth provinces also included some agricultural provinces, not only from western Poland (Piła and Leszno), but also from southeastern Poland (Krosno).

Figure 7.
Sigma convergence in European Regions and Countries 1950–1990



Source: for Poland, own estimates based on the Tables in the Appendix; for other countries and regions, Roses and Wolf 2019; in the case of Poland: 1976 and 1986 instead of 1980 and 1990.

The above conclusions are confirmed by the sigma-convergence results for Poland from 1950 to 1986 (see Fig. 7). Sigma-convergence can be observed in two periods – the 1950s and the first half of the 1970s. During the other periods, there is either

divergence (1960s) or no significant change (1976–1986). This corresponds with the relationship between the dynamics of regional income per capita and the dynamics of industrial employment (see Fig. A1 in the Appendix). Convergence occurs during periods of strong correlation between growth in industrial employment and growth in national income per capita. The above correlation suggests the hypothesis that the main significance for the occurrence of regional convergence in Poland were the industrialisation policies, rather than the egalitarian policies pursued by the government. However, further in-depth research would be required to confirm this.

A comparison of regional sigma-convergence for Poland and Western Europe reveals both similarities and differences. The level of regional differentiation at the end of the 1980s in Poland was similar to that of countries in Southern Europe (though we are comparing slightly different measures of economic development: national income and GDP): higher than in Spain and Italy, but lower than in Portugal. However, in contrast to the Mediterranean countries, the dynamics of changes were lower: in Poland from 31% to 26%, while in Portugal from 40% to 30%, in Spain from 33% to 21% and in Italy from 38% to 25%. By contrast, compared to the highly developed European regions of Scandinavia, the British Isles, France and the German-speaking countries, the dynamics of change are similar, but the level of differentiation in the late 1980s is higher (Fig. 10).

Based on these observations, one can draw a conclusion about the limited effectiveness of state socialism in Poland in bridging the development gap towards capitalist countries in Europe. This is particularly evident in comparison with the Mediterranean countries, whose economies before World War II were at a similar level of development to Poland. After the war, regional differences in these countries decreased at a much faster rate than in communist-ruled Poland.

6. Robustness check

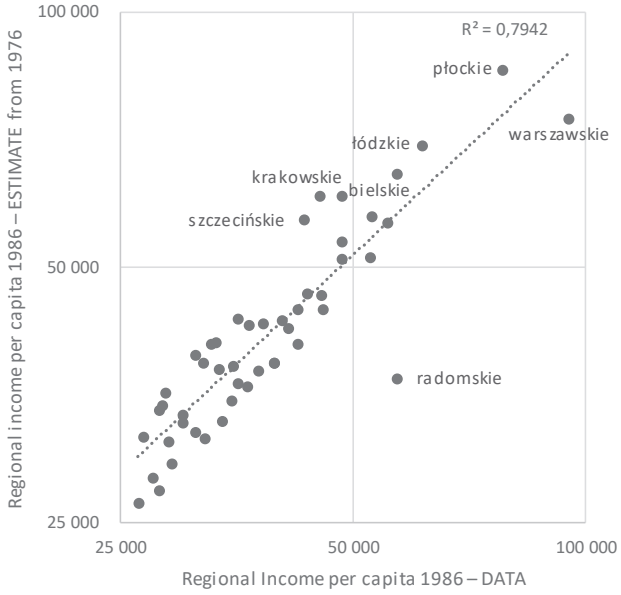
In order to verify the reliability of our method of estimating the regional national income in the People's Republic of Poland, we carried out an additional estimation for the year 1986, i.e. the year for which official estimates from Statistics Poland (GUS) are available. The test procedure is as follows. As the first step, we take the available regional – 49 voivodeships – data on industrial employment and population for 1986. In the second step, based on the data, we estimate the national income per capita in 1986, using a formula linking income with population and industrial employment in the pre-1975 administrative split into 22 regions (17 voivodeships and five cities). The coefficients in the formula were estimated for 1973, i.e. the last year for which the relevant Statistics Poland data were available. Together with the analogically estimated regional national income in 1976, this allowed us to calculate the regional growth rate in the period 1976–1986. In the third step, we use this dynamic to transfer the official estimates of national income in 1976 to 1986. Then we compare the results with the official estimate of Statistics Poland for that date (Fig. 8 below). The match at a regional level is good ($R2 = 0.79$), although some differences can be noticed for three types of voivodeships.

The first case is Warsaw, which saw above-average development of the service sector in the 1980s, especially in concerning finance and insurance. As a result, our

method based on industrial employment underestimated the income by about 27%. The opposite happened in ten industrialised regions (e.g. Kraków, Szczecin, Bielsko, etc.) for which we overestimated the income by 15% to 25%. These voivodeships were particularly affected by the crisis of the 1980s, which – as a result of the full employment policy – maintained the number of industrial workers despite a significant decline in the level of production, which affected the accuracy of our estimates. Finally, the third and completely separate case is the Radom Voivodeship, whose income, according to Statistics Poland, increased by over 60% between 1976 and 1986. This happened despite the fact that Polish national income in the same period remained fairly stable and no significant structural change can be detected in the region in the form of statistics such as the sectoral employment or human capital level. Therefore, this may be a statistical artefact resulting from the incorrect recognition of income in this voivodeship in 1976, or the result of a reallocation of part of the income from neighbouring regions. In either case, this should not affect the estimates for the 1950–1970 period.

Despite these deviations, our estimate of the aggregate level of Polish national income corresponds to official data with an accuracy of 1% (PLZ 51,469 according to our estimates vs. PLZ 51,004 in the GUS data). Combined with a high level of R2 and the belief that the problems specific to the crisis of the 1980s were not encountered in the years of centrally planned industrialisation (1950–1970), we conclude that our method works well enough for the entire period 1950–1986 to be used for the analysis of the regional convergence in the period of the Polish People's Republic.

Figure 8.
Regional income per capita – official data vs estimation



Source: own estimate based on the Tables in the Appendix.

7. Conclusions

One would expect the introduction of the Soviet system and policies based on Marxist ideology to be combined with measures to reduce various types of inequality, including regional economic inequality, which would consequently reduce the disparity in the quality of life between large agglomerations and other regions. The results indicate that, during the period of communist rule in Poland, regional convergence was similar to that of the developed capitalist countries of Western Europe.

Development inequalities between the 49 Polish voivodeships declined during periods of intensive industrialisation in the 1950s and during the large-scale economic modernisation programme in the first half of the 1970s. This correlation suggests that additional fiscal stimulus translated into economic improvement in peripheral regions, as suggested by Prandecka. On the basis of the study, it is impossible to say what the mechanism of this impact was, namely whether it was due to increased emigration to more developed regions, and thus an indirect relative increase in regional income per capita, or to higher efficiency of investment spending in the poorer regions, or whether other factors were at play. Resolving these questions requires more detailed research.

Our results indicate that the weakening of state economic activity was accompanied by divergence, as happened in the 1960s. It seems that a similar situation would have occurred in the last period since 1976, as these were the years of the deepest economic crisis and subsequent stagnation. However, in the latter case, the economic slowdown was accompanied by the 1975 administrative reform. The effect of the reform diminished the importance of the large administrative centres (large agglomerations with the exception of Warsaw) in absorbing investment funds, while at the same time giving a developmental boost to smaller cities, which were given the status of provincial capitals. However, questions about the real impact of the economic crisis and administrative reform on convergence between regions also requires further study to find answers.

Our analysis has made it possible to identify general trends in changes in regional development differentiation in Poland after World War II, using the most detailed administrative division to date. Previous analyses covering the years up to 1976, particularly those from Statistics Poland, took into account a far less detailed division. The results presented here show the trends accompanying the changes in the policies pursued by Communist governments from the 1950s to the 1980s. In this sense, the results obtained, which are incomplete by their nature, reveal many problems that should be analysed in order to present as accurately as possible the significance of various aspects of the communist state's policies on the evolution of regional inequality between regions, but also on the significance of these policies and their consequences for regional differentiation after the collapse of the communist system.

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Appendix

Table A1.
Regional Income per capita (Poland = 100)

	1950	1960	1970	1976	1986
bialskopodlaskie	53.57	53.82	54.96	56.2	59.2
białostockie	85.48	90.56	88.85	89.1	98.3
bielskie	129.76	123.11	138.28	130.4	103.9
bydgoskie	99.85	92.71	89.66	89.1	87.2
chełmskie	69.62	75.00	64.86	69.3	64.9
ciechanowskie	54.13	53.99	52.91	54.9	62.8
częstochowskie	101.49	97.05	90.84	87.3	78.9
elbląskie	89.60	85.08	78.26	73.5	78.6
gdańskie	125.15	123.60	125.01	120.8	113.9
gorzowskie	90.17	90.55	82.42	81.3	81.0
jeleniogórskie	133.05	114.92	102.59	100.3	94.0
kaliskie	76.97	75.15	73.13	71.1	75.1
katowickie	136.92	123.27	130.36	132.3	122.8
kieleckie	74.45	75.78	77.58	79.9	75.3
konińskie	66.67	67.44	73.24	75.9	70.6
koszalińskie	84.37	81.76	77.31	76.4	76.2
krakowskie	128.85	133.54	129.63	125.2	97.6
krośnieńskie	91.03	83.83	82.66	83.0	71.4
legnickie	126.31	124.14	112.58	113.4	119.5
leszczyńskie	86.08	79.09	68.93	67.1	64.9
lubelskie	70.45	83.68	84.76	84.9	88.6
łomżyńskie	43.66	52.05	48.39	53.1	60.5
łódzkie	199.51	169.76	161.79	152.0	132.4
nowosądeckie	51.46	53.73	51.32	49.9	56.7
olsztyńskie	89.87	89.68	88.50	87.7	76.5
opolskie	101.07	99.04	97.54	93.5	91.5
ostrołęckie	47.38	54.26	53.59	59.4	57.7
pilskie	83.55	73.69	70.13	66.9	67.2
piotrkowskie	89.25	84.93	81.08	80.2	91.2
płockie	79.31	81.28	165.27	168.7	168.1
poznańskie	126.48	116.56	114.71	111.5	104.0
przemyskie	66.95	66.15	63.80	66.2	60.4
radomskie	72.06	72.94	74.16	74.6	122.5
rzeszowskie	71.42	87.95	90.23	90.7	97.9
siedleckie	49.23	57.49	60.03	64.8	61.0
sieradzkie	81.13	84.60	80.46	77.3	67.3

	1950	1960	1970	1976	1986
skierniewickie	77.49	71.17	68.42	64.0	69.3
słupskie	70.87	68.97	71.01	67.2	72.8
suwalskie	66.62	66.57	62.41	62.4	62.0
szczecińskie	126.56	123.33	121.85	118.8	92.9
tarnobrzeskie	69.10	75.68	80.50	78.3	84.9
tarnowskie	67.67	82.52	80.62	78.9	72.2
toruńskie	89.38	87.23	83.00	80.3	85.1
wałbrzyskie	121.10	102.94	97.22	92.4	82.5
warszawskie	140.09	148.65	155.20	151.4	204.7
włocławskie	90.74	85.52	77.85	77.2	68.7
wrocławskie	121.29	113.44	112.31	109.6	113.5
zamojskie	63.45	69.38	66.45	69.0	61.4
zielonogórskie	133.50	118.44	113.75	108.0	104.1

S*ource*: for years 1950–1970 own calculations, based on Misztal, Kaczorowski (1979), for year 1976: GUS (1979), for year 1986: GUS (1989).

Table A2.
Population (in thousands)

	1950	1960	1970	1976	1986
warszawskie	1285.7	1747.7	1997.7	2172	2432
bialskopodlaskie	247.9	276.1	279.9	280	301
białostockie	479.3	548.2	597.5	620	680
bielskie	567.2	654.9	734.7	784	884
bydgoskie	677.4	829.3	939.1	1002	1097
chełmskie	190.4	216.3	219.5	222	243
ciechanowskie	352.1	382.2	396.1	399	422
częstochowskie	585.3	670	712.3	729	771
elbląskie	281.1	379.8	410.9	424	472
gdańskie	730.2	940.6	1136.4	1263	1420
gorzowskie	276.6	371.5	411.4	437	491
jeleniogórskie	332.5	440.5	474.1	488	514
kaliskie	524.6	583.7	625.9	646	704
katowickie	2422.4	2896	3241.2	3512	3971
kieleckie	860.7	972.1	1015	1041	1116
konińskie	358.7	385.9	415.9	426	463
koszalińskie	262.4	352.4	404.4	437	498
krakowskie (miejskie)	752.6	924.8	1043.3	1129	1216

	1950	1960	1970	1976	1986
krośnieńskie	311	369.3	405.1	424	484
legnickie	217.9	306.9	366.8	419	503
leszczyńskie	277.2	314.7	333.7	344	380
lubelskie	637.2	746.3	841.8	891	997
łomżyńskie	306.4	322	325	320	342
łódzkie (miejskie)	837.8	964.6	1032.7	1086	1148
nowosądeckie	472.3	529.6	578.9	601	679
olsztyńskie	444.5	565.1	627.8	668	739
opolskie	717.9	826.6	928.7	975	1023
ostrołęckie	314	340.9	358.8	362	389
pilskie	306.2	369.5	402.6	419	472
piotrkowskie	527	568.7	578.3	584	639
płockie	390.9	425.3	467.2	482	513
poznańskie	825.9	986.8	1102.1	1179	1316
przemyskie	300.2	349.3	366.6	375	401
radomskie	579.4	642.4	664	680	737
rzeszowskie	468.1	525.2	578.8	613	704
siedleckie	556.6	592.2	600.9	602	642
sieradzkie	366.4	378.9	378.8	387	404
skierniewickie	332.6	368.1	384	389	413
słupskie	224.5	289.9	334.4	358	404
suwalskie	292.1	368.9	400.2	416	459
szczecińskie	457.8	666.3	788.7	861	959
tarnobrzeskie	448	497.3	519.5	537	587
tarnowskie	484.2	520.1	561.1	582	652
toruńskie	419.8	500.9	556.5	590	650
wałbrzyskie	531.7	667.1	701.9	717	739
włocławskie	346.1	375.8	395.6	404	428
wrocławskie	633.5	849.5	969.3	1032	1121
zamojskie	429.2	472	475	471	490
zielonogórskie	364.7	503.3	553.2	583	655

Source: for years: 1950–1970: Misztal, Kaczorowski (1979), for year 1976: GUS (1979), for year 1986: GUS (1989).

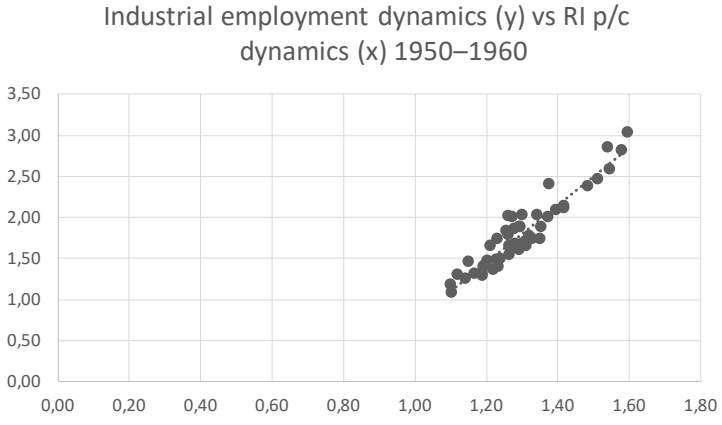
Table A3.
Urban population and industrial employment (in thousands)

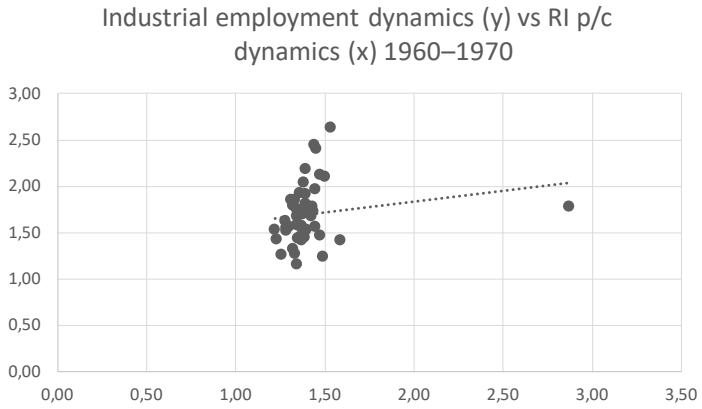
	Urban population					Industrial employment				
	1950	1960	1970	1976	1986	1950	1960	1970	1976	1986
warszawskie	35.2	49.3	62.5	72	101	3.1	5.2	12.7	18.6	20.5
bialskopodlaskie	124.6	194.3	262.8	302.4	401	15	30.1	52.7	68	72.1
białostockie	188.6	247.9	299.5	332	430	76.4	112.8	159.9	175.6	174.7
bielskie	328.3	442.6	534.3	591.8	691	60	88.4	128.9	155.6	151.5
bydgoskie	36.4	51.9	63.8	73.2	99	4.4	9.2	14.1	24	20.5
chełmskie	65.3	79.7	96.6	109.1	144	5.5	8.8	17.9	26.1	35
ciechanowskie	201.8	262.5	304.6	324.6	397	54.7	81.9	107.8	121.1	129.8
częstochowskie	115.1	176.1	208.3	227.2	279	14.8	25.7	40.2	46.2	50.9
elbląskie	470.2	655	834.4	942.3	1073	52.1	96.5	161.9	182.7	167.7
gdańskie	102.7	168	210.8	238.1	295	14.9	30.2	46	60.9	54.2
gorzowskie	166.1	244.2	283.6	300.3	337	53.4	69.3	86.9	108.3	96.1
jeleniogórskie	166.4	209.9	241.6	260.3	317	32.9	50.8	79.9	94.4	96.3
kaliskie	1985.2	2422.1	2762.1	2995.3	3460	515.5	678.7	839.3	912.8	857.9
katowickie	197.5	276.6	348.8	395.8	503	47.1	83.2	130.2	165.9	146.8
kieleckie	67.2	83.4	117.8	133.6	182	6.6	10.9	28.7	41.9	57.5
konińskie	90.4	165.3	216.2	248.1	304	10	18.3	33.8	45.5	43.9
koszalińskie	405.8	561.4	684.3	765	838	52.3	106	150.4	168.6	152.8
krakowskie (miejskie)	59.7	84.3	105.4	117.3	161	16.7	23.3	44.5	61.1	65.3
krośnieńskie	72.9	129.4	190.3	240.5	336	16.1	32.2	52.1	77.5	84.1
legnickie	91.8	114	130.3	139.3	177	14.2	18.8	26.8	34.6	38.6
leszczyńskie	192.5	281.5	388.4	441.6	559	17.1	48.8	86.8	108	111.3
lubelskie	44.9	60.8	77.5	87.3	127	2.4	6.2	11.5	19.5	22.6
łomżyńskie	740.5	857.6	930.5	979.5	1051	233	251.1	290.8	299	237.7
łódzkie (miejskie)	114.2	145.6	172.5	190.2	242	14.1	26.6	44.5	53.4	62.5
nowosądeckie	142	219.4	280.5	324.1	421	15.3	28.8	52.1	65.8	67.4
olsztyńskie	228.1	314.3	399.9	456	523	61.4	99.2	148.2	162.3	157.6
opolskie	45.3	57.1	75.9	89.6	124	2.9	6.9	15.1	26.3	35.4
ostrołęckie	108.7	150.1	184.2	202	256	17.8	22.3	39	46.9	48
pilskie	141.2	174.6	199.7	215.2	303	37.9	52.7	75.6	93.2	105.7
piotrkowskie	97.2	118.9	160.1	182.9	238	12.8	22.2	39.5	54.9	59.2
płockie	493	622.3	727.2	794	914	78.4	110.3	158.9	178.1	167.4
poznańskie	76.2	97.4	110.4	118.4	145	6.7	11.2	21.6	32.1	36.3
przemyskie	144.6	193.9	236.2	263.7	331	25.5	43.5	75	95.4	105.4

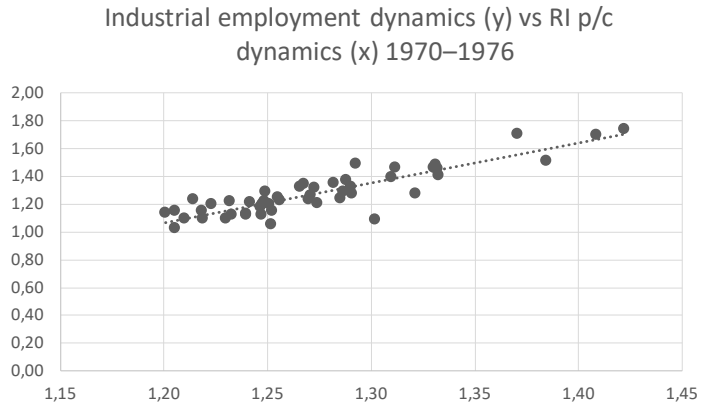
	Urban population					Industrial employment				
	1950	1960	1970	1976	1986	1950	1960	1970	1976	1986
radomskie	80.5	125.3	161.3	187.2	278	10.6	32.1	63.1	83.5	99.3
rzeszowskie	78.3	98.8	123.7	141.9	192	5.6	13.8	29.3	44.3	61.7
siedleckie	65.7	78.9	95.7	105.6	139	10.4	18	30.1	36.7	44.7
sieradzkie	88.9	111.2	130.8	141.6	184	18	23.2	40	45.4	51.4
skierniewickie	73.8	118.8	154.3	175.3	217	8.2	14.6	35.1	43.3	45
słupskie	74.5	115.4	148.9	171.2	233	7.3	13.7	24.5	33.1	35.2
suwalskie	273.5	433.7	552.8	614.5	708	27.9	56.3	97	116.2	105.4
szczecińskie	60.4	87.9	120.6	143.3	208	13.5	28.9	60.7	73.9	78.6
tarnobrzeskie	95.1	126.1	155.7	176.9	226	12.6	35.5	60	73.5	78.6
tarnowskie	190.1	247.1	293.5	325.3	399	27	44.7	70.5	85.3	78.7
toruńskie	337.8	445.4	489.8	510	540	105.4	123.6	156.5	171.1	140.3
wałbrzyskie	1077.8	1492.9	1731.1	1890.7	2141	94.8	227.8	334.7	353.2	332.2
włocławskie	99.9	120.2	140.7	156.6	195	14.4	19.6	30.3	39.8	43.3
wrocławskie	380.8	542.1	664.1	723.3	810	61.5	101.5	154.7	177.8	152.6
zamojskie	48.4	61.4	80.9	92.1	125	6.3	13.3	23.2	32.7	32.7
zielonogórskie	149.2	242.2	294.4	322.3	387	35.6	52	81.6	93.9	89.4

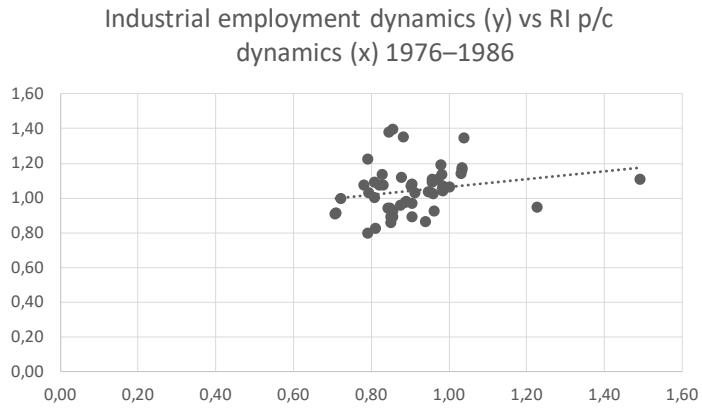
Source: for years 1950–1970: Misztal, Kaczorowski (1979), for year 1976: GUS (1979), for year 1986: GUS (1989).

Figure A1.
Industrial employment and dynamics of Regional Income (RI) per capita dynamics for selected periods









Source: own calculations, based on Misztal, Kaczorowski (1979), GUS (1979), GUS (1989).