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Creative Destruction and Regional Productivity: Evidence from the Polish Regions in 2004–2015[1]

Abstract: A considerable and persisting diversity of the development levels of Polish regions makes it necessary to seek potential causes of this phenomenon. It can be presumed that some of the diversity is caused by institutional qualities, characteristic for each individual region, including the dynamics of the reallocation of resources available in a particular region, which can be identified with the creative destruction processes, indicated by J.A. Schumpeter. In the view of these facts, this study aims at identifying the mechanisms of creative destruction processes and assessing their influence on the levels of regional productivity of labour in Poland, in the 2004–2015 time period. The conducted analyses showed that the correlation between the measures of creative destruction and the labour productivity is ambiguous and limited, as it was confirmed for only a part of Polish regions. For the remaining part, contrary to the theoretical assumptions, a reverse relationship was observed, i.e. it is the dynamics of productivity that affects the level of reallocation of resources, identified with the processes of creative destruction.

Keywords: creative destruction, resource reallocation, labour productivity, regional analysis

JEL: E23, O47

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1. Introduction

Research into the influence of creative destruction processes on the broadly understood functions of economy, or, in a narrower sense, on the productivity of labour, has its origin in J.A. Schumpeter's works. He wrote: "process of industrial mutation – if I may use that biological term – that instantly revolutionises the economic structure from within, incessantly destroying the old one, incessantly creating a new one. Destruction is the essential fact about capitalism" (Schumpeter, 1942: 83). Although a long time has passed since this publication, today both theoretical and empirical analyses also refer to Schumpeter's theory of creative destruction as a potentially powerful factor influencing economic development. The growing significance of this type of analyses results from the differences in the socio-economic development between countries, which cannot be explained by means of the so-called traditional growth factors, identified by the neoclassical theory of growth, with its continuations and expansions (i.e. the accumulation of physical and human capital, technological progress and innovation). These differences are considerable and occur also between Polish regions. It is demonstrated, among others, by the fact that regional productivity levels – one of the key indicators of socio-economic development – are nearly twice as high for the most prosperous Polish provinces as compared to regions with the lowest prosperity (cf. Jarmołowicz, Kuźmar, 2016).

In view of this fact, the objective of this study is to identify the mechanisms, as well as to assess the influence of the creative destruction processes (understood as the number of established and liquidated companies and the number of created and lost workplaces) on the levels of regional productivity in Poland in the period 2004–2015.

With a view to defining the theoretical correlation between the creative destruction processes and the dynamics of productivity, an overview of the empirical research into the significance of these processes at the regional level will be presented. The further part of the study will present the analysis of the significance of the processes identified with the creative destruction for shaping productivity in Polish regions, in addition to presenting the data and the applied methods. The final part will include short conclusions, pointing to the most important implications of the conducted analyses.

2. Creative destruction and regional productivity – literature review

An effective reallocation of resources (labour, capital) is regarded as one of the fundamental factors affecting the level and the dynamics of productivity. With reference to the productivity of labour in the industrial sector, Bartelsman and Doms (2000: 571) point out that it is: "characterized by large shifts in employment and output across establishments every year – the aggregate data belie the tremendous amount of turmoil underneath. This turmoil is a major force contributing to productivity growth, resurrecting the Schumpeterian idea of creative-destruction". Other authors, Cahuc and Zylberberg (2006: 1) emphasize that "every working day in the United States 90,000 jobs disappear and an equal number are created; and a similar process has long been at work in all the industrialized countries. It is closely related to the way in which market economies create wealth. Without this phenomenon of creative destruction we would simply never have experienced growth".

At the same time, a growing number of authors claim that the progressing globalisation contributes to the growing significance of regions and regional factors for generating economic growth (Castells, Hall, 1994; Storper, 1997; Camagni, 2002; Bosma, Stam, Schutjens, 2011). Additionally, accepting the region as a subject of the research into the significance of creative destruction processes seems valid, due to the nature and the possible significance of the regional economic environment for these processes. Schutjens and Stam (2003) stress the fact that it is at the regional level that particular conditions of entry, scale of competition, or possibilities of cooperation – the underlying determinants of entrepreneurship – occur. Moreover, these authors point out that new businesses are usually established in the locations where their founders come from or where they live. Schutjens and Stam (2003: 115) go as far as arguing that start-ups deliberately limit their activity to the regional level for the first 3 years of existence, fearing an expansion into less familiar markets.

In the light of the general consensus among economist about the positive role of creative destruction processes for the growth of the effectiveness of resources and, in consequence, the growth in productivity, it seems essential to ask a question about the mechanisms, or channels, through which these processes boost effectiveness. According to J.A. Schumpeter's (1942) theory, there are two elementary mechanisms through which creative destruction stimulates productivity growth. Firstly, new enterprises are characterised by a higher degree of innovativeness than firms already present on the markets. Secondly, the appearance of these enterprises forces the incumbent entities to raise their effectiveness, or – if they fail to comply – it causes a considerable decline in their competitiveness and, as a re-

sult, the necessity to disappear from the market. These exits are important because the released resources can be reallocated to more productive activities. According to the argument, the intensity of the observed turbulence would be an indicator of the innovative processes that affect and ultimately renew economic activities. Aghion and Bessonova (2006: 260–261) go as far as pointing out that a mere threat of the entry of new firms enhances innovation and productivity growth, not only as a direct result of quality-improving innovations from new entrants, but also because the threat of being driven out by a potential entrant gives incumbent firms an incentive to innovate in order to escape entry – an effect that works much like the escape competition effect.

However, there is also an opinion in literature (Bosma, Stam, Schutjens, 2011: 403) that, if new entrants are less efficient than the incumbents, the efforts involved in the emergence of entrants may even waste valuable resources. In such a situation, the new firm entry is not a driver of competitiveness at all. This situation has been identified in the literature (Audretsch, Fritsch, 2002) as a *revolving door regime*: entrants have to exit relatively soon after start-up, owing to an insufficient level of efficiency. This revolving door regime reflects a situation with high entry rates, but with no subsequent improvement of either employment levels or productivity.

The significance of creative destruction (the number of entries and exits of businesses) for the functioning of regional economies is observed and acknowledged, which is reflected by the growing number of empirical studies verifying and corroborating this correlation. For instance, Johnson and Parker (1996), examining the lag effects of firm births and deaths on production growth at the UK county level for 1990, established a positive and significant relationship. Braunerhjelm and Borgman (2004) in their research comprising 143 industries in 70 Swedish regions confirmed that apart from the degree of concentration in the production of goods and services, regional entrepreneurship and regional absorption capacity are important explanations of regional labour productivity growth, whereas the impact of the skill-level and economies of scale is more mixed.

However, Dejardin (2009) points out that although the direct contribution of new firms to value creation and growth may be regarded as tautological, the aggregate impacts are largely empirically unobserved. Using the data for Belgian administrative districts (the 43 arrondissements) for the period 1982–1996, author tested the net entry effects on subsequent economic growth in the manufacturing and services industries and provided evidence for some positive impact of net entry on regional economic growth in the services industry. Bosma et al., (2009) in their study related to the effect of firm entries and exits on the competitiveness of regions, as measured by total factor of productivity growth, based on data from 40 regions in the Netherlands over the period 1988–2002, found out that firm entry is related to productivity growth in services, but not

in manufacturing. They argue that the positive impact found in services does not necessarily imply that new firms are more efficient than incumbent ones; high degrees of creative destruction may also improve the efficiency of incumbent firms.

A more recent study conducted by Zhou, He and Zhu (2017), focused on the role of the industrial renewal and particularly on the capability of a certain geographical region to generate and attract new entrants to offset the destruction caused by firm exits, using firm-level data of China's industries during 1998–2008, proved that firm exits do stimulate firm entry, as new entrants are enticed by resources released by firm exit in the same industry and region.

3. Creative destruction and regional labour productivity in Poland – empirical verification

3.1. Data and methodology

The assessment of the significance of creative destruction processes for the productivity of labour in 16 Polish voivodeships in the period 2004–2015 was based on the data from the Central Statistical Office in Poland, with the Regional Databases and also on data from the annual reports of CSO Employment in National Economy (different editions from the period 2005–2016).

The levels of regional productivity of labour were established on the basis of the annual levels of Gross Value Added (GVA) per worker[2], expressed in fixed prices in PLN from 2010. With the view to assessing the significance of creative destruction, taking into account Schumpeter's (1942) theoretical deliberations, the data related to both the entering and exiting enterprises per 10 thousand inhabitants were used. Additionally, the combined measure of entrepreneurship – that is, turbulence rate, defined as the sum of entry and exit rates – was taken into account. In the light of the potential importance of processes associated with both creating and reducing jobs, also in incumbent companies (see Bartelsman, Haltiwanger, Scarpetta, 2013), the data related to the new jobs and the lost ones expressed as a percentage of the average employment rate in a given year were used, as well as the joint measure – reallocation rate – i.e. the number of jobs lost in contracting or exiting firms plus the number of jobs gained in new or expanding firms in a particular year divided by the average employment as a percentage. The basic

2 Labor productivity can be measured by the Gross Domestic Product (GDP) or Gross Value Added (GVA). Although these two different measures can both be used as output measures, there is normally a strong correlation between the two. There is a preference for value added as taxes are excluded (Freeman, 2008: 5).

descriptive statistics of the analysed data are presented in Table 1. Figure 1 shows the spatial diversity of the productivity of labour in Polish regions in the period 2004–2015. According to the presented data, the analysed macroeconomic variable takes definitely the highest value in the Mazowieckie Voivodeship, but high values of the productivity of labour were also observed in the following voivodeships: Dolnośląskie, Śląskie and Pomorskie. Somewhat lower values appear in voivodeships: Zachodniopomorskie, Wielkopolskie, Lubuskie and Opolskie. The group of voivodeships with an average level of productivity consists of: Kujawsko-Pomorskie, Łódzkie, Małopolskie and Warmińsko-Mazurskie. Low productivity values (below 71K PLN) were observed in: Podlaskie, Świętokrzyskie, Podkarpackie and Lubelskie.

Table 1. Descriptive statistics of the variables, non-weighted averages for years 2004–2015

Variable	Obs	Mean	Std. Dev.	Min	Max	Measur_unit
Labor productivity	192	85542	16436	54557	139069	PLN, constant prices 2010
Firm_number	192	966,14	173,52	662,73	1432,07	per 10K population
Firm_Entries	192	82,98	19,13	42,44	128,13	per 10K population
Firm_Exits	192	70,21	20,97	29,87	166,25	per 10K population
Firm_ turbulance	192	153,19	35,85	80,29	253,92	per 10K population
Job_creation	192	5,03	1,27	2,59	8,34	% of total employement
Job_ destrucion	192	3,03	1,54	0,81	7,83	% of total employement
Job_ reallocation	192	8,07	2,56	3,66	15,71	% of total employement

Source: own elaboration, based on the Polish Central Statistical Office data: stat.gov.pl

Figures 2 and 3 present the distribution of measures of creative destruction processes at the regional level, taking into account the total number of firm entries and exits, as well as job creations and job losses in particular regions. The analysis of data related to businesses allows for an observation that the highest turbulence rate (in the range of 202–170 firms per 10K inhabitants) occurs in the following voivodeships: Zachodniopomorskie, Pomorskie, Mazowieckie, and Dolnośląskie.

The lowest levels of this variable (below 124.58 firms per 10K inhabitants) were observed in the voivodeships: Świętokrzyskie, Opolskie, Lubelskie, and Podkarpackie.

The data shown in Figure 3 provide grounds for a conclusion that Polish regions are characterised by a relatively low level of diversity in the job reallocation rate. The total percentage of created and lost workplaces was in the range 7–9.5% in the analysed period.

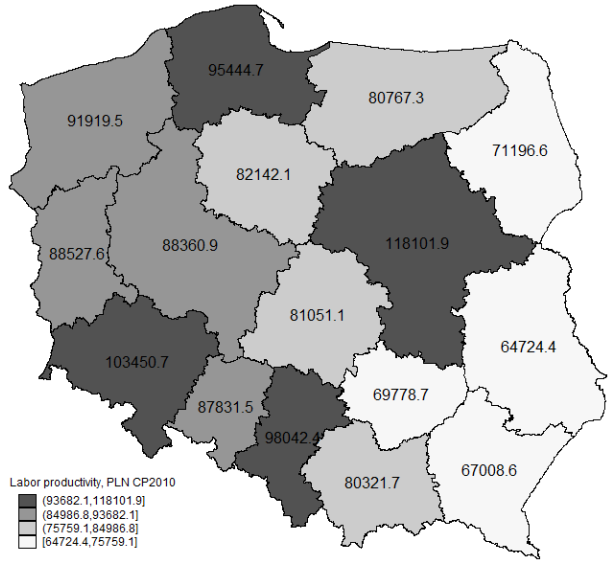

Figure 1. Labour productivity (average for years 2004–2015, PLN 2010)
Source: own elaboration, based on Polish Central Statistical Office data: stat.gov.pl

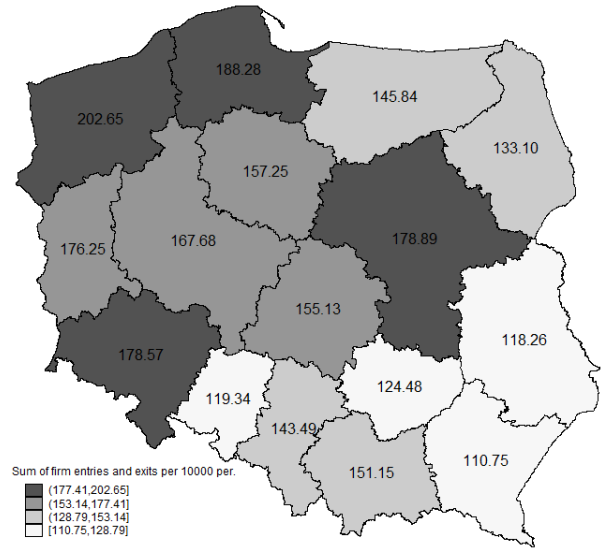

Figure 2. Turbulence rate in Polish regions (average for years 2004–2015)
Source: own elaboration, based on Polish Central Statistical Office data: stat.gov.pl

The voivodeships with the highest level of this measure are: Lubuskie, Łódzkie, Warmińsko-Mazurskie, and Opolskie. The lowest levels were observed in: Zachodniopomorskie, Podlaskie, Lubelskie and Kujawsko-Pomorskie. At the same

time, the data shown in Figure 3, as already noted, indicate that Polish regions are characterised by a relatively low level of diversity of the job reallocation rate. Voivodeships with the highest level of this value are: Lubuskie, Łódzkie, Warmińsko-Mazurskie and Opolskie. The lowest levels were observed in: Zachodniopomorskie, Podlaskie, Lubelskie and Kujawsko-Pomorskie.

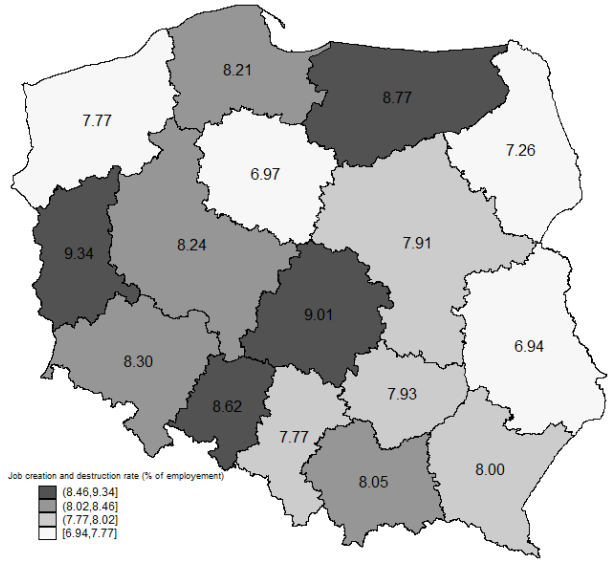

Figure 3. Job reallocation rate in Polish regions (average for years 2004–2015)
Source: own elaboration, based on Polish Central Statistical Office data: stat.gov.pl

A preliminary analysis of the presented data allows for an observation that there is no special relationship between the two studied values related to creative destruction, i.e. the turbulence rate and the job allocation rate. Nevertheless, the relationship between firm entries and firm exits and the productivity of labour seems to be more significant than that between productivity and job reallocation. For the sake of a more thorough analysis of the mutual relations between the presented values, Table 2 shows the results of the analysis of correlations between the studied values.

The analysis of correlations between the productivity of labour and the applied measures of creative destruction confirmed the existence of a statistically valid and positive relationship between all the indicators of creative destruction and the indicator of the total number of firms per 10K inhabitants in a region.

However, the obtained results indicate significant discrepancies between particular measures. For instance, the highest values of the correlation coefficient (over 0.65) between productivity and the studied measures of creative destruction were observed for measures such as the number of new firms and the turbulence rate.

At the same time, these values were considerably lower for the other measures of creative destruction. It is notable that the correlation coefficients between the number of businesses operating in a given region and the dynamics of job loss and creation were the lowest, whereas in the case of the percentage of lost workplaces, they were statistically insignificant. It should be also emphasised that the high values of the correlation between the turbulence rate and firm entries and exits levels result from the character of the turbulence rate indicator which is calculated as the sum of entry and exit rates.

Table 2. Correlation matrix

Variable	Labour productivity	Firm number	Firm Entries	Firm Exits	Firm turbulance	Job creation	Job destrucion
Firm_ number	0.8280*	1.0000					
	0.0000						
Firm_ Entries	0.7516*	0.8191*	1.0000				
	0.0000	0.0000					
Firm_Exits	0.4507*	0.4849*	0.5979*	1.0000			
	0.0000	0.0000	0.0000				
Firm_ turbulence	0.6647*	0.7207*	0.8833*	0.9039*	1.0000		
	0.0000	0.0000	0.0000	0.0000			
Job_ creation	0.4279*	0.2612*	0.4944*	0.4111*	0.5042*	1.0000	
	0.0000	0.0003	0.0000	0.0000	0.0000		
Job_ destruction	0.2999*	0.1049	0.4119*	0.3981*	0.4526*	0.6629*	1.0000
	0.0000	0.1477	0.0000	0.0000	0.0000	0.0000	
Job_ reallocation	0.3919*	0.1923*	0.4921*	0.4426*	0.5215*	0.8931*	0.9288*
	0.0000	0.0075	0.0000	0.0000	0.0000	0.0000	0.0000

Note: the table presents the values of Pearson's correlation coefficient. Asterics "*" mark the cases in which the hypothesis about the lack of correlations has been rejected at the significance level under 1% (p-value < 0.000).

Source: own elaboration, based on Polish Central Statistical Office data: stat.gov.pl

While assessing the correlation between different macroeconomic values, it must be born in mind that the existence of a correlation does not prove the real causal link, nor does it allow for defining the direction of the analysed correlation, i.e. whether or not the creative destruction level contributes to the higher levels of productivity, or perhaps the higher development level is the determinant of more dynamic changes in the number of companies or jobs in a given region. Taking all this into account, for the sake of an in-depth identification and assessment of correlations between the above-mentioned values, this study analyses the causal relations between the level of productivity and the level of creative destruction in the Polish regions in the period 2004–2015, by means of Granger causality test (Granger, 1969).

In the Granger's sense, causality between variables y and x (productivity and creative destruction measures) occurs only if the current values of y can be fore-

cast with a higher accuracy by means of the past values of x than without using them. These tests are based on autoregressive equations with distributed lag (Osińska, 2008: 77):

$$y_t = \alpha + \sum_{j=1}^{p} \beta_j y_{t-1} + \varepsilon_t \tag{1}$$

and

$$y_t = \alpha + \sum_{j=1}^{p} \beta_j y_{t-1} + \sum_{j=1}^{p} \gamma_j x_{t-1} + \mu_t . \tag{2}$$

The tested hypothesis assumes that $\gamma_1 = \gamma_2 = \ldots = \gamma_p = 0$, which means that x is not a cause in Granger's sense. This hypothesis is verified on the basis of the Wald test, which verifies the difference in the level of matching of equations (1) and (2).

3.2. Results

The results of the conducted analyses for each of the studied measures of productivity and for all the voivodeships (96 tests) are presented in Tables 3a and 3b. A thorough analysis of the causal link between the measures of creative destruction and productivity of labour revealed that correlations of this type occur only in some of the voivodeships. At the same time, for some of the voivodeships a reverse relation was observed, i.e. the productivity level in a given region is the cause of changes in the number of active firms, as well as the dynamics of jobs gained and lost. The data included in the tables indicate that a statistically valid relationship between the coefficient of the number of newly created companies and the productivity level was observed in the following voivodeships: Dolnośląskie, Lubelskie, Łódzkie, Opolskie, Podlaskie and Śląskie[3]. The Mazowieckie voivodeship displays a reverse relation[4], i.e. higher productivity levels led to higher dynamics of creating new companies in the Granger's sense.

Other voivodeships with the reverse relation for the percentage of liquidated companies are: Lubelskie, Opolskie, Podkarpackie, Pomorskie, Świętokrzyskie, and Wielkopolskie. In the case of the firm turbulence coefficient, the occurrence of the statistically valid relationship between the studied values was confirmed for merely four voivodeships: Dolnośląskie (a bidirectional relation), Lubelskie, where the turbulence level stimulated changes in the levels of the productivity of labour,

3 This kind of relation was marked by the right sided arrows, here and in subsequent cases.

4 This kind of relation was marked by the left sided arrows, here and in subsequent cases.

Mazowieckie and Podkarpackie. For the last two regions these were the observed levels of productivity that affected the dynamics of firm entries and exits.

Table 3a. Labour productivity and creative destruction – Granger causality test results

Region	Firm_Entries			Firm_Exits			Firm_turbulrnce		
	chi2	p-value	caus. way	chi2	p-value	caus. way	chi2	p-value	caus. way
Dolnośląskie	3,70	0,054**	→	0,64	0,424		2,76	0,097***	→
	0,44	0,506		0,70	0,403		2,69	0,101***	←
Kujawsko-pomorskie	1,89	0,169		0,13	0,719		0,47	0,495	
	1,63	0,202		0,02	0,901		0,06	0,814	
Lubelskie	10,46	0,001*	→	1,00	0,317		13,61	0,000*	→
	0,18	0,670		8,13	0,004*	←	0,82	0,364	
Lubuskie	0,08	0,772		1,04	0,308		0,94	0,331	
	0,04	0,839		0,05	0,829		0,03	0,873	
Łódzkie	5,39	0,02**	→	0,93	0,336		1,71	0,191	
	0,04	0,836		0,12	0,733		0,00	0,999	
Małopolskie	0,79	0,375		0,26	0,608		0,08	0,773	
	0,78	0,378		3,57	0,059		1,53	0,216	
Mazowieckie	0,65	0,422		0,14	0,710		0,46	0,497	
	6,91	0,009*	←	5,96	0,015		4,18	0,041**	←
Opolskie	3,07	0,08***	→	0,14	0,713		0,98	0,323	
	0,01	0,914		4,11	0,043**	←	0,59	0,444	
Podkarpackie	0,09	0,762		1,85	0,174		1,98	0,159	
	0,40	0,529		5,64	0,018**	←	3,27	0,071***	←
Podlaskie	11,15	0,001*	→	0,35	0,556		1,01	0,316	
	0,17	0,679		1,21	0,272		0,01	0,930	
Pomorskie	0,71	0,399		0,71	0,398		1,79	0,181	
	0,06	0,800		3,09	0,079***	←	1,10	0,295	
Śląskie	2,51	0,101***	→	0,11	0,745		1,31	0,252	
	0,14	0,711		1,56	0,211		0,28	0,597	
Świętokrzyskie	1,90	0,169		0,36	0,550		1,11	0,292	
	1,26	0,261		5,16	0,023**	←	1,74	0,187	
Warmińsko-mazurskie	1,37	0,242		0,66	0,418		0,00	0,962	
	0,54	0,461		0,23	0,634		0,06	0,813	
Wielkopolskie	0,785	0,375		1,77	0,184		0,30	0,583	
	0,827	0,363		3,48	0,062***	←	0,81	0,367	
Zachodniopomorskie	0,150	0,699		0,37	0,543		0,39	0,532	
	0,913	0,339		1,96	0,161		0,22	0,636	

Note: causality tests were carried out (based on Akaike information criterion) for lags of 1 (t – 1). The cases in which the null hypothesis was rejected (i.e. the causative relationship in Granger's sense was confirmed) at the levels of significance 10%, 5%, and 1% were marked with *, **, and ***, respectively.

Source: own elaboration, based on the Polish Central Statistical Office data: stat.gov.pl

Table 3b. Labour productivity and creative destruction – Granger causality test results

Region	Job_creation			Job_destruction			Job_reallocation		
	chi2	p-value	caus. way	chi2	p-value	caus. way	chi2	p-value	caus. way
Dolnośląskie	1,04	0,307		4,88	0,027**	→	7,77	0,005*	→
	0,47	0,492		0,25	0,614		0,19	0,664	
Kujawsko-pomorskie	0,38	0,540		1,02	0,312		0,94	0,333	
	0,12	0,726		0,00	0,985		0,02	0,880	
Lubelskie	0,00	0,991		2,69	0,101***	→	0,86	0,354	
	5,40	0,020**	←	0,00	0,945		0,84	0,359	
Lubuskie	0,11	0,743		0,03	0,870		0,00	0,985	
	2,15	0,142		0,00	0,945		0,23	0,633	
Łódzkie	2,62	0,101***	→	1,85	0,174		2,85	0,091***	→
	0,80	0,370		0,27	0,601		0,48	0,490	
Małopolskie	1,93	0,165		0,10	0,748		0,74	0,390	
	1,77	0,183		1,65	0,199		1,54	0,215	
Mazowieckie	0,34	0,557		6,89	0,009*	→	1,12	0,291	
	4,94	0,026**	←	0,03	0,859		0,61	0,435	
Opolskie	0,20	0,656		0,02	0,889		0,09	0,760	
	0,05	0,815		0,96	0,327		0,00	0,952	
Podkarpackie	2,80	0,094***	→	2,38	0,123		3,81	0,051***	→
	20,16	0,000*	←	1,52	0,218		3,70	0,055***	←
Podlaskie	1,97	0,160		1,48	0,224		1,99	0,158	
	0,82	0,364		0,11	0,746		0,07	0,795	
Pomorskie	3,10	0,078***	→	1,24	0,266		2,73	0,099***	→
	9,93	0,002*	←	0,16	0,690		2,18	0,140	
Śląskie	6,42	0,011**		0,52	0,470		0,11	0,746	
	0,00	0,989		0,57	0,452		0,07	0,792	
Świętokrzyskie	0,48	0,490		2,59	0,108		1,67	0,196	
	3,64	0,056***	←	4,41	0,036**	←	3,68	0,055***	←
Warmińsko-mazurskie	3,24	0,072***	→	0,53	0,468		0,03	0,864	
	1,05	0,305		0,52	0,472		0,06	0,806	
Wielkopolskie	0,80	0,372		1,47	0,226		0,18	0,671	
	4,22	0,040**	←	0,16	0,688		0,19	0,664	
Zachodniopomorskie	0,11	0,735		0,28	0,598		0,25	0,614	
	2,21	0,137		0,77	0,379		0,91	0,341	

Note: causality tests were carried out (based on Akaike information criterion) for lags of 1 ($t-1$). The cases in which the null hypothesis was rejected (i.e. the causative relationship in Granger's sense was confirmed) at the levels of significance 10%, 5%, and 1% were marked with *, **, and ***, respectively.

Source: own elaboration, based on the Polish Central Statistical Office data: stat.gov.pl

Similar trends were observed for correlations between the productivity of labour and the number of jobs gained and lost. A positive relationship between the new workplaces and productivity occurred in: Łódzkie, Podkarpackie, Pomorskie, and Warmińsko-Mazurskie voivodeships. A reverse relationship was observed in: Lubelskie, Mazowieckie, Podkarpackie, Pomorskie, Świętokrzyskie and

Wielkopolskie. In the case of the rate of lost jobs, a causal relationship between this measure of creative destruction and productivity occurred in the voivodeships: Dolnośląskie, Lubelskie, and Mazowieckie. The reverse direction of the relationship was observed in the Świętokrzyskie voivodeship. The influence of the joint measure of the sum of jobs gained and lost on the productivity of labour was confirmed in the following voivodeships: Dolnoślaskie, Łódzkie, Podkarpackie and Pomorskie, whereas a reverse relationship occurred in Podkarpackie and Świętokrzyskie.

Therefore, the research findings justify a conclusion that the observed relation between the measure of creative destruction and the productivity of labour is ambiguous – in some of the voivodeships, contrary to the theoretical assumptions, it is the dynamics of productivity that affects the level of reallocation of resources in companies. Moreover, it is worth noting that for some regions this relation was bidirectional. However, the obtained results should be approached with caution, due to the relatively short period of research.

4. Summary

The subject of this study was an attempted identification of the mechanisms of creative destruction and the assessment of its influence on the level of the regional productivity of labour in Poland in the period 2004–2015.

Literature sources indicate that Schumpeter's idea of creative destruction has a significant impact on the performance of particular countries and regions, which has been confirmed by a growing number of empirical studies.

The empirical research into Polish regions has demonstrated that they are characterised by a significantly diversified level of both the productivity of labour and the identified measures of creative destruction. However, in spite of the high levels of the correlation coefficient between some of the measures of creative destruction and productivity, a deeper analysis only partly confirmed the theoretical assumptions.

In conclusion, the conducted causality tests showed that the causal relationship between the measures of creative destruction and the productivity of labour occurred only in some of Polish regions. In spite of the theoretical assumptions, in some voivodeships a reverse relation was observed, i.e. it was the dynamics of productivity that affected the level of the reallocation of resources, identified with the creative destruction processes. The research also revealed voivodeships where no correlation between these values was observed.

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Kreatywna destrukcja a regionalna wydajność pracy w Polsce w latach 2004–2015

Streszczenie: Wysokie oraz utrzymujące się zróżnicowanie w poziomach rozwoju polskich regionów zmusza do poszukiwania potencjalnych przyczyn tego zjawiska. Za jedną z nich można uznać indywidualne, charakterystyczne dla danego regionu cechy instytucjonalne, w tym dynamikę realokacji zasobów dostępnych w danym regionie, którą można utożsamić z procesami kreatywnej destrukcji identyfikowanymi przez J.A. Schumpetera. Wobec powyższego celem artykułu była identyfikacja mechanizmów oraz ocena wpływu procesów kreatywnej destrukcji na poziomy regionalnej wydajności pracy w Polsce w latach 2004–2015. Przeprowadzone analizy wykazały, że zależność obserwowana między miarami kreatywnej destrukcji a wydajnością pracy ma charakter niejednoznaczny i ograniczony. Potwierdzono ją bowiem tylko dla niektórych polskich regionów. W części województw, wbrew założeniom teoretycznym, zaobserwowano zależność odwrotną, co znaczy, że to dynamika wydajności wpływała na poziom realokacji zasobów utożsamianych z procesami kreatywnej destrukcji.

Słowa kluczowe: kreatywna destrukcja, realokacja zasobów, wydajność pracy, analizy regionalne

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