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The effect of changes in the economic structure on entrepreneurial activity in a transition economy: the case of Poland

JEL Classification: *L16; L26; M 13; P20*

Keywords: *structural changes; entrepreneurial activity; transition economy; service sector*

Abstract

Research background: While entrepreneurship in transition economies is the subject of a growing body of literature, the debate on factors influencing entrepreneurial activity in such economies is still incomplete. This paper extends this debate by focusing on the effect of changes in the economic structure on entrepreneurship in Poland. The findings might be supportive for policymakers in pursuing policy aimed at boosting entrepreneurship in a transition economy.
Purpose of the article: The aim of the paper is to investigate the extent to which changes in the economic structure impact entrepreneurial activity in Poland. The paper contributes to the literature by providing empirical support to the pending research efforts to recognize entrepreneurship dimensions in a transition economy.
Methods: The hypothesis was tested with fixed effects panel regression with robust standard errors. Data were sourced from the Statistics Poland for all Polish NUTS–2 regions for the period 2003–2017. Panel data are balanced and include 3 600 observations.
Findings & Value added: This paper extends previous research on factors affecting entrepreneurial activity in a transition economy by focusing on the importance of changes in the economic structure for new firm creation. The findings provide evidence of the significant value of the service sector in boosting entrepreneurial activity in Poland. The findings might attract attention of policymakers. Fostering structural change towards smart specialization in services should be regarded when constituting programmes supporting entrepreneurship.

Introduction

One of the important, albeit relatively under-researched, fields of entrepreneurship is its relationship with structural changes. A few studies in this field seek to identify the role of entrepreneurship in inducing structural changes in economy (Gries & Naudé, 2008, pp. 1–43; Neffke *et al.*, 2017, pp. 23–48). However, this paper is positioned differently by following the approach of Reynolds *et al.* (1995, p. 403), Fritch and Falck (2007, p. 158) and Gajewski and Kutan (2018, p. 204), who claim that new business formation is determined by the economic sector's specific conditions.

This paper focuses on a transition economy. While entrepreneurship issues in such an economy have been the subject of earlier studies providing insight on entrepreneurial patterns and conditions (e.g., McMillan & Woodruff, 2002, pp. 153–170; Pietrzak *et al.*, 2018, pp. 190–203; Rogalska, 2018, pp. 1479–1487; Zygmunt, A., 2018, pp. 6942–6948; Zygmunt, J., 2018, pp. 6999–7006), and more particularly on institutional changes (e.g., Estrin & Mickiewicz, 2010, pp. 1–42) and entrepreneurial orientation (e.g., Tyszka *et al.*, 2011, pp. 124–131; Ahunov & Yusupov, 2017, pp. 7–11), the literature seems to be surprisingly silent on the effect of changes in the economic structure on entrepreneurship. Since this structure determines knowledge and technology development (Xiao *et al.*, 2018, p. 516), and more generally, economic growth (Vu, 2017, pp. 64–77), it seems important to recognize how changes in the economic structure create an incentive for entrepreneurial activity. That issue seems especially important when a transition economic is considered, mostly because of the following aspects: (i) the shift from a centrally planned to a market economy involves drastic changes in the economic structure, (ii) transition to a market economy opens up the potential for evincing entrepreneurial activity, which was mostly strangled in a centrally planned economy. Hence, the goal of this paper is to fill a gap in the literature by examining the extent to which changes in the economic structure impact on entrepreneurial activity in Poland. Focusing on Poland has two advantages in the analysis. First, Poland underwent fundamental structural changes during transition from a centrally planned to a market economy. Second, with its transition nearly over (Kitov, 2009, pp. 526–548), it represents the first country from the former Soviet bloc to be ranked since September 2018 as a "developed market" on the FTSE Russell index. Fixed effects panel regression with robust standard errors was used as the research method in this paper.

This paper adds to studies that seek to identify determinants of entrepreneurship in a transition economy, as well as in other economies with an upward structural changes trend, and complements the growing body of

literature investigating relationships between entrepreneurship and structural changes.

In the remainder of the paper, the next section provides theoretical background and hypothesis development. Then, the research method, sample and variables are described. This is followed by the presentation and discussion of the results. In the last section, major conclusions are presented, together with research implications, limitations, and suggested directions for future research.

Literature review

Structural change is expressed in "the reallocation of labour and value added across sectors" (Ciarli & Valente, 2016, p. 40). It implies the "continual shift" (Vu, 2017, p. 64) which takes place from lower productivity sectors to those which are characterised by higher productivity. It has been widely observed that such a shift is reflected in receding from agriculture to manufacturing, and thereafter, to the prevalence of the service sector (e.g. Gries & Naudé, 2008, p. 1). It is accompanied by a decrease in value added and in the share of labour in agriculture (Cai, 2015, p. 55), subsequent productivity growth in manufacturing (Gurgul & Lach, 2015, p. 17), and an increase in the share of employment in services (Alonso-Carrera & Raurich, 2015, p. 359).

One might expect that in line with the pattern, changes in the economic structure in a transition economy are embodied in diminishing significance of agriculture, productivity growth in manufacturing, and increasing importance of services. Indeed, as observed by Fernandes (2009, p. 48), the overall labour productivity in manufacturing is likely to increase in a transition economy. However, structural changes in such an economy do not always evince themselves in that way. Gurgul and Lach (2015, pp. 15–32) observed, for some transition economies from Central and Eastern Europe, that while the importance of manufacturing diminishes in favour of services in the course of transition, agriculture might be regarded as the key sector in their economic structure.

While changes in the economic structure are likely to affect all economies, a key issue are differences in market conditions at the initial stage, varied rates at which such changes occur, and disparate outcomes. Particularly, a transition economy provides a valuable framework for investigating processes related to changes in the economic structure. This is because of, especially at the first stage of transition, predominant weight of manufacturing and a high share of employment in agriculture (Raiser *et al.*, 2004,

pp. 48–62), with the service sector mostly neglected. Additionally, structural changes in such an economy concern not only a shift in value added and labour among respective sectors, but also involve radical reallocation of ownership from the public to private sector, which makes the processes of structural change even more complex.

One of the most important issues which a transition economy faces in reallocating resources, mostly at the first stage of transition, is a lack of institutional and market environment (Estrin & Mickiewicz, 2010, pp. 1–42) and high instability. However, during the processes of transition, the market opportunities and market competition are likely to emerge (Smallbone & Welter, 2001, p. 249). That may create the conditions for boosting entrepreneurial activity. Indeed, as observed by Gurgul and Lach (2015, p. 16), the emergence of "new private entrepreneurial culture" is evidenced. Along the same lines, Fritsch *et al.* (2014, p. 438) argue, using the example of East Germany, that transition processes induce the development of "long-lasting persistence of […] entrepreneurial culture" which originated long before the socialist period. Hence, it might be expected that entrepreneurship is more likely to develop during structural change that accompanies the processes of transition from a centrally planned towards a market economy. However, the development of the ability to identify and take advantage of emerging opportunity fields for entrepreneurs, mostly at the early stage of transition, is a challenge. High market volatility may hinder the estimation of risk and market demand while entrepreneurs mostly lack the understanding of market norms and values (Estrin & Mickiewicz, 2010, p. 10) and show a deficiency of necessary skills and knowledge (Fritsch *et al.*, 2014, p. 431). That permits the assumption that a relationship between structural changes and entrepreneurial activity is not obvious, and subsequently, provides motivation to investigate whether an evident increase in entrepreneurship in transition economies (McMillan & Woodruff, 2002, pp. 153–170) originates from changes in the economic structure. Hence, it is interesting to examine to what extent structural changes are important for the development of entrepreneurship in these economies.

Therefore, it can be hypothesised:

(H1): *Entrepreneurial activity in a transition economy is associated with structural changes in this economy.*

Research methodology

To investigate the extent to which changes in the economic structure impact on entrepreneurial activity in Poland, fixed effects panel regression with robust standard errors was used. Since cross-region heterogeneity in the degree of entrepreneurship (Bosma & Schutjens, 2011, pp. 711–742), and to some extent in the economic structure, is often identified, this suggests a need to control for the location differences. Hence, to test the research hypothesis, evidence from the region level was used. The panel consists of one cross-section dimension i for the respective Polish NUTS-2 regions, with $i = 1, 2, \ldots, 16$, and one time dimension t, with $t =$ 2003, …, 2017. The empirical analysis draws from the Statistics Poland. Panel data comprise of 3 600 observations and are balanced.

The estimated model was described as:

$$E_{it} = CES_{it}\beta_1 + U_{it}\beta_2 + HW_{it}\beta_3 + D_{it}\beta_4 + GDP_{it}\beta_5 + \\ + INC_{it}\beta_6 + \alpha_i + \varepsilon_{it} \tag{1}$$

where E_{it} is entrepreneurial activity represented by the ln number of start-ups in region i and year t. While there are many ways to conceptualise start-ups (Reynolds, 2017, pp. 41–56), the number of start-ups was measured by the initial listing in the National Official Business Register REGON. In line with the literature, it was assumed that there are three sectors: manufacture, agriculture and services (see, e.g., Raiser *et al*., 2004, pp. 47–81; Alonso-Carrera & Raurich, 2015, pp. 359–374; Cai, 2015, pp. 54–64). The complexity of processes related to structural changes requires the usage of various variables. Hence, three different variables were used to proxy changes in the economic structure (CES_{it}). The first is in line with e.g. Alonso-Carrera and Raurich (2015, p. 293) and Vu (2017, pp. 64–77), and expresses *change in the sectoral shapes of employment* in respective sectors in region i and year t. The second is the labour productivity in the economy sectors (Fernandes, 2009, p. 471) measured as the *gross value added per employee* in respective sectors in region i and year t. The third is in line with Cai (2015, p. 54) and shows the *share of labour* in respective sectors in region i and year t.

To address possible omitted variable bias, a set of independent control variables that are likely to affect entrepreneurship was used. Specifically, on the basis of the literature, it was assumed that entrepreneurial activity may be determined by the unemployment level. While, as observed by Smallbone and Welter (2001, p. 258), starting a new firm may be regarded as “an alternative to unemployment” in market economies, this relationship

seems to be especially significant in a transition economy. That is because of high unemployment, especially at the beginning of transition, when many firms go bankrupt as a consequence of the inability to adapt to the rules of market economy (Gurgul & Lach, 2015, p. 28) and critical structural shocks (Earle & Sakova, 2000, p. 576) leading in many cases to the creation of 'out of need' firms (Fritsch *et al.*, 2014, p. 430). Hence, it is expected that unemployment growth is followed by an increase in the number of new firms. *Unemployment* (U_{it}) was proxied by the unemployment rate in region i and year t.

It also seems interesting to control for human capital. According to Bosma and Schutjens (2011, p. 722), human capital has its value in starting a new firm. Particularly, human capital seems to be of utmost importance in a transition economy (Estrin & Mickiewicz, 2010, p. 9) by determining the capability to "shift from public to private sector ownership" (Smallbone & Welter, 2001, p. 249). Therefore, human capital was measured as *highly skilled workforce (*HW_{it}*)* by the share of the population with tertiary education degrees in relation to total employment in region i in time t. It is expected that this variable correlates positively with E_{it}.

Since entrepreneurial activity may be also affected by demand for products and services, it seems also important to control for *population density (*D_{it}*)*, as it has been evidenced that it reflects demand in question (Wagner & Sternberg, 2004, p. 229–230). It was measured as the number of people per square kilometre in region i in time t. A positive relationship between population density and entrepreneurial activity is expected.

Entrepreneurial activity may also depend on economic development. Two variables were used as proxies for that development. The first is in line with Ahunov and Yusupov (2017, p. 9) and Pietrzak *et al.* (2018, p. 194) and is the *Gross Domestic Product (GDP) per capita* in region i and year t (GDP_{it}). It is expected that together with the growth in GDP per capita, an increasing number of new firms is observed. The second is according to Wennekers *et al.* (2005, pp. 293–309) and is defined as a *nominal income per capita* in region i and year t (INC_{it}). Since low income has an impact on necessity-driven entrepreneurship (Tyszka *et al.*, 2011, p. 129), it might be expected that along with an income rise the number of start-ups declines.

Table 1 provides a summary of statistics for the variables used in the analysis.

Durbin–Watson statistic was employed to check for the autocorrelation, while Wald statistic was used to control for the heteroscedasticity. Test F was used to verify estimated results. To detect potential multicollinearity problems, Pearson's correlation coefficient was used.

Results

Mostly because there were various variables used to proxy for changes in the economic structure, the results were checked for possible multicollinearities throughout the model-building process. While the intercorrelations among the majority of variables were quite low or moderate, indeed, multicollinearity between *gross value added per employee in manufacturing* and *gross value added per employee in services* was observed. This can be attributed, at least in part, to the fact that, as observed by Fernandes (2009, p. 491) for transition economies, "services liberalization is likely to also benefit the performance of the manufacturing sector". However, the exclusion of one of these variables from the model may not entirely allow for the identification to what extent the respective sectors matter for entrepreneurial activity in a transition economy. Hence, each individual sector was investigated separately, followed by the analysis for all variables jointly. Finally, four models were estimated allowing for all CES_{it} variables, with Models 1 to 3 testing for the impact of respectively: agriculture, manufacturing, and service sector, and Model 4 testing all sectors collectively.

Since a high level of a collinearity was also observed for *GDP per capita* and *nominal income per capita*, both between each other and also with some of other variables[1], they were excluded from further analysis.

Results from regressions based on the model represented by Eq. (1) are reported in Table 2.

By estimating Model 1, it was found that the coefficient for *share of labour in agriculture* is statistically significant at the 1% level. The effect of the share of labour in agriculture with regard to entrepreneurial activity is positive. The estimation results for the other variables for the agricultural sector are ambiguous, though. No statistically significant effect of *change in the sectoral shapes of employment in agriculture* and *gross value added per employee in agriculture* has been identified. Thus the evidence is not clear. Therefore, Hypothesis 1 can be confirmed only when the share of labour in agriculture is considered. The results for control variable *highly skilled workforce* are significant at the 1% level and indicate its expected, positive relationship with entrepreneurial activity.

Model 2 provides, to some extent, evidence that manufacturing has its importance for entrepreneurial activity in a transition economy. Both *share of labour in manufacturing* and *gross value added per employee in manufacturing* have their expected positive and significant sign at the 1% level.

[1] Intercorrelations were observed between the variables in question, as well as between them and the following variables: *highly skilled workforce*, *gross value added per employee in manufacturing*, and *gross value added per employee in services.*

However, *the change in the sectoral shapes of employment in manufacturing* showing the expected sign, was not significantly associated with entrepreneurial activity. Thus, Hypothesis 1 was supported only partially.

The results indicate that *share of labour* and *gross value added per employee* in the service sector matter for entrepreneurial activity in a transition economy (Model 3). More specifically, as expected, these effects are positive and significant (at the 1% level). With regard to that, Hypothesis 1 can be confirmed. However, for the *change in the sectoral shapes of employment,* the relationship is not significant. Thus, the validity of Hypothesis 1 with regard to that proxy was rejected.

When the total economic structure is regarded (Model 4), its impact on entrepreneurial activity is heterogeneous. The agricultural sector shows no statistically significant effect. The results for the manufacturing sector do not provide expected evidence either. However, the impact of *gross value added per employee in manufacturing* was not investigated. This is because of multicollinearity which was identified between that variable and *gross value added per employee in services*, leading to the exclusion of the first one from Model 4. The results indicate that in line with the expectations the service sector tends to be important for entrepreneurial activity in a transition economy. The coefficient for *gross value added per employee in services* is positive and statistically significant at the 1% level. However, the relationship with entrepreneurial activity has not been significant for either *share of labour in services or change in the sectoral shapes of employment in services*. Therefore, Hypothesis 1 can be confirmed only for *gross value added per employee in services*.

Among the controls, a strong positive relation between *population density* and entrepreneurial activity has been identified in all models. Interestingly, the coefficient for *unemployment*, although showing the expected sign, was not significant in all estimations, except for Model 3. Since multicollinearity between *gross value added per employee* both in manufacturing and services and *highly skilled workforce* was identified, the latter was excluded respectively from Models 2–4.

Discussion

The evidence supports to some extent the assumption of the importance of structural changes for entrepreneurial activity in a transition economy. The findings are not homogenous, though. While a statistically significant relationship between the share of labour in all sectors and the number of start-ups is observed, changes in the sectoral shapes of employment seem to

have no value in boosting entrepreneurial activity in Poland. This is to a degree in line with Gajewski and Kutan (2018, p. 201–222), who found that new firm creation in Poland is affected by the share in services and agriculture. It has been also confirmed that entrepreneurial activity in a transition economy tends to increase together with a growth in gross value added per employee both in manufacturing and service sectors. The evidence shows a fundamental role of services in the creation of new firms, especially when all sectors are considered jointly. It is to some extent in line with Fernandes (2009, pp. 467–501) and Gurgul and Lach (2015, p. 27), who observed a growing importance of the service sector in the economic structure of transition economies.

The findings for control variables evidence, as expected, that entrepreneurial activity shows a strong positive relationship with demand for products and services in a transition economy. It is consistent with Gajewski and Kutan (2018, p. 213), who also identified a strong relationship between the number of start-ups and population in Poland. A different picture emerges from the observation of unemployment rate and its influence on new firm creation in Poland. In particular, contrary to what was supposed, the results for most models provide evidence that entrepreneurial activity in a transition economy is not affected by the unemployment level. This observation is not consistent with Fritsch *et al.* (2014, p. 441), who, indeed, noticed that a rise in the unemployment rate increases new firm creation in a transition economy. However, the results from Model 3 support that observation. This calls for further investigation of 'out of need' firms in Poland. Another important finding is that highly skilled workforce is important for an increase of new firm creation in Poland[2]. It confirms the findings of Gries and Naudé (2008, p. 15) for structural economic transformation that human capital and entrepreneurial activity are strongly linked. It is also in line with Smallbone and Welter (2001, p. 261), who emphasise a substantial role of human capital in developing businesses by entrepreneurs, especially when transition processes to a market economy are considered.

Conclusions

This paper investigates the extent to which changes in the economic structure impact on entrepreneurial activity in Poland. Using regional level data from the Statistics Poland, the key contribution of this paper is that it con-

[2] As explained earlier, the relationship was estimated only in Model 1.

firms, to some extent, the relationships between changes in the economic structure in Poland and entrepreneurial activity. More specifically, it is important to stress that new firm creation in a transition economy is influenced by the share of labour and gross value added per employee in manufacturing and services. The findings suggest also that the service sector plays a significant role in boosting entrepreneurial activity in Poland. It has been also confirmed that demand for products and services and human capital matter in terms of starting a new firm in a transition economy. The findings provide empirical support to the ongoing research efforts to account for factors influencing entrepreneurial activity in a transition economy.

Several policy insights can be drawn from the findings of this paper. Given the importance of the service sector, the evidence suggests a potential for entrepreneurship growth if policymakers pursue efforts by fostering the service sector. Policymakers should be aware of the growing importance of gross value added per employee in this sector in enhancing entrepreneurial activity in Poland. Fostering structural change towards smart specialisation within this sector might lead to positive effects for the entrepreneurial environment.

This paper has several limitations which can serve as avenues for future research. First, although in accordance with the majority of the literature the economic structure has been regarded as agriculture, manufacturing and service sectors, a more thorough approach seems necessary. Specifically, since the service sector is likely to significantly affect entrepreneurial activity in a transition economy, further studies should account for different dynamics within this sector, for example by considering market- and non-market services (Raiser *et al.*, 2004, p. 64). Second, while this paper focuses on the impact of changes in the economic structure on entrepreneurship, a closer examination of the inverse relationship would seem promising by identifying the extent to which transition processes encourage entrepreneurial attitudes, leading subsequently to shifts in the economic structure.

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Annex

Table 1. Descriptive statistics

Variable	Obs	Mean	Min	Max	SD
Entrepreneurial activity (in ln)	240	9.742	8.531	11.134	0.605
Share of labour in agriculture (in %)	240	14.842	2.200	37.500	7.990
Change in the sectoral shapes of employment in agriculture (in %)	240	-2.101	-26.316	30.375	9.307
Gross value added per employee in agriculture (in thousand PLN per employee)	240	19.231	2.100	43.100	9.842
Share of labour in manufacturing (in %)	240	30.450	18.800	40.700	5.019
Change in the sectoral shapes of employment in manufacturing (in %)	240	1.991	-11.504	22.124	6.146
Gross value added per employee in manufacturing (in thousand PLN per employee)	240	106.881	54.700	208.700	31.979
Share of labour in services (in %)	240	54.707	42.000	67.000	5.486
Change in the sectoral shapes of employment in services (in %)	240	1.903	-16.370	13.768	4.998
Gross value added per employee in services (in thousand PLN per employed)	240	96.112	64.400	159.800	19.177
Unemployment (in %)	240	11.157	3.100	26.000	4.899
Highly skilled workforce (in %)	240	33.845	20.182	57.217	7.392
Population density (in people per km^2)	240	129.246	59.000	382.000	74.586
GDP per capita (in ln of PLN per capita)	240	10.375	9.681	11.328	0.322
Nominal income per capita (in ln of PLN per capita)	240	9.964	9.450	10.522	0.239

Source: own estimation based on data sourced from the Statistics Poland.

Table 2. Estimation results

	Model 1 (Agriculture)	Model 2 (Manufacturing)	Model 3 (Services)	Model 4 (All sectors)
const	8.2217***	9.0699***	6.0802***	29.3868
	(0.1745)	(0.1567)	(0.1575)	(80.4046)
Share of labour in agriculture	0.01127***			0.2292
	(0.0022)			(0.8032)
Change in the sectoral shapes of employment in agriculture	0.0016			0.0019
	(0.0035)			(0.0035)
Gross value added per employee in agriculture	0.0045			0.0022
	(0.0029)			(0.0032)
Share of labour in manufacturing		0.0195***		0.2442
		(0.0042)		(0.8043)
Change in the sectoral shapes of employment in manufacturing		0.0001		0.0019
		(0.0044)		(0.0044)
Gross value added per employee in manufacturing		0.0064***		
		(0.0006)		
Share of labour in services			0.0386***	0.1844
			(0.0035)	(0.8011)
Change in the sectoral shapes of employment in services			0.0037	0.0013
			(0.0045)	(0.0059)
Gross value added per employee in services			0.0098***	0.0079***
			(0.0019)	(0.0025)
Unemployment	0.0064	0.0025	0.0088*	0.0016
	(0.0051)	(0.0069)	(0.0048)	(0.0072)
Highly skilled workforce	0.0307***			
	(0.0031)			
Population density	0.0038***	0.0047***	0.0038***	0.0041***
	(0.0003)	(0.0002)	(0.0001)	(0.0003)
F	235.42***	343.96***	422.63***	543.11***
$LSDV\ R-squared$	0.5139	0.4461	0.6011	0.6162
$Within\ R-squared$	0.5115	0.4433	0.5991	0.6143

Heteroscedasticity and autocorrelation consistent. Standard errors in parenthesis. Level of statistical significance: ***p≤0.01; *p≤0.10.

Source: own estimation based on data sourced from the Statistics Poland.