Competitiveness profiles
of manufacturing mesostructure

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Abstract

The objective of this article is assessment of competitiveness and identification of manufacturing mesostructure characteristics in Poland in 1990–2017. The analysis is presented in the context of an assessment of transformation effects in the countries of Central Europe (CEB, SEE) with regard to structural changes and macroeconomic competitiveness. The author's own research concerned 14,000 enterprises (full test, whole group of enterprises included in the public statistics in Poland) and concerned mesostructure development phases, changes of PKD divisions, the focal point way, objects classification and comparative analysis of submesostructure profiles. The research includes synthetic (multivariate) competitiveness measures. The measurement concerned the synthetic measure, its two partial measures (productiveness of labour and export productiveness of costs) and its factors (unit costs and efficiency of labour and intensity of export activity and general effectiveness). The value of the conducted research is its uniqueness – the analysis concerns all enterprises covered by public statistics and included in the manufacturing mesostructure of the Polish economy. This is the first research of this type in Poland. An important added value is the constructed model of factor analysis of the competitiveness and variability of the mesostructure and its profiling in terms of the size classes of enterprises. This is the first model to be used in the assessment of competitiveness at the mesoeconomic level of the countries undergoing transformation in Central Europe.

INTRODUCTION

Changes and economic transformations constitute a broad platform for research studies. It includes a multiple processes creating the main fields of changes: macroeconomic stabilization, microeconomic liberalization, institutional restructuring and privatisation. In Poland the transformation model can be characterised by its radicalism of changes, the heterodoxy of reforms, the rapid opening up of the economy, the anticipatory character of solutions, and integration with developed countries. The implementation process revealed a number of dilemmas and disharmonies (Åslund, 2002) including the unjustified attribution of key significance to privatisation as a measure of quality changes (Radulescu & Barlow, 2005; Staehr, 2003). It was clearly pointed out by M. Friedman, who stated that the rule of law is more important, leading to the creation of market institutions (Fukuyama, 2004).

The end of the process of changes and their effects highlights the semantics of the term "transformation" vs transition (Gros & Steinherr, 2004; Koźmiński, 2008). In Poland, an economic system was created in which economic policies became an exogenic factor regulating only the dynamism of the system. It indicates the accomplishment of an economic transformation, or rather – the accomplishment of this phase (industrial civilisation) which has not led to the modernisation of economic structures and implementation of solutions appropriate for an information–based civilization and a knowledge–based economy (Grogan & Moers, 2001; Heybey & Murrell, 1999).

The changes relate to the developmental processes of the economy creating the image of multiple simultaneous transformations (Roland, 2000). The detailed objectives and key developmental processes referring to them include: structural changes, increase in competitiveness and restructuring as well as the development of entrepreneurship and enterprises (Bałtowski & Miszewski, 2006). Competitiveness is the subject of interest in this article.

The review of the literature indicates a significant gap in the form of a lack of knowledge, mainly in the field of empirical cognition, referring to the study of competitiveness at the mesoeconomic level. The numerous constraints on the limited access to figures, as well as the multiplicity of elements necessary to cover the analysis and their structural links, are the main reasons for this gap and for this reason the research has to be undertaken.

The article presents the results of the author's research concerning competitiveness – one of the four aforementioned processes. Therefore, I created the analytic model using the connection between the factors and partial measures constituting the synthetic measure of competitiveness. The analysed structure – crucial for the economy (61.9% of produced value added) – is manufacturing mesostructure in Poland in 1990–2017. The research concerned 14,000 enterprises – full test, whole group of enterprises included in the public statistics in Poland (data relating to individual companies).

The objective of this article is the assessment of competitiveness and identification of manufacturing mesostructure features. The analysis and assessment included the density of mesostructure objects, position of focal point and its way. The classification of objects was also conducted. It was performed with the use of defined normative patterns. During the survey, the test of similarity level of manufacturing mesostructure profiles was conducted with the application of average rank position, variability of this position and normative patterns. The criterion used to extract the submesostructures was the class of enterprise size (small, medium, large).

The assessment of transformation effects in the countries of Central Europe (CEB, SEE) with regard to structural changes and macroeconomic competitiveness is the background of the research of mesoeconomic competitiveness. An assessment of the intensity of transformation is provided using a transition rate (6 partial measures). Its broadening is the assessment of structural changes (16 partial measures collected in four groups). In the assessment of macroeconomic competitiveness, the in–depth study focused on its structure – the factors that determine it (12 pillars forming a measure of competitiveness).

The value of the research lies in its uniqueness. As it has been pointed out earlier, it concerns all enterprises covered by official statistics and included in the manufacturing mesostructure of the Polish economy (therefore, surveys are not based a research sample). This is the first study of its type in Poland. The value of the research is created by a constructed model of factor analysis of the competitiveness and variability of the mesostructure and its profiling in terms of enterprise size classes. This is the first such model to be used in the assessment of the competitiveness at the mesoeconomic level of the countries undergoing transformation in Central Europe.

The value of research is also enhanced by a broader perspective on understanding and assessing competitiveness. The research of manufacturing mesostructure of the Polish economy is presented in a wider context of the assessment of macroeconomic competitiveness and transformation of the Polish and Central European economies, which broadens the context of understanding this complex economic category.

LITERATURE REVIEW

Competitiveness is a diversified concept which is difficult to examine, inter alia, due to the necessity of comparison with the environment. It is also criticized for overrating its role, lack of clear definitions, and for the difficulty of evaluating and selecting its measures. It arouses numerous controversies – to the point of questioning its meaning as a factor of change – which, however, should be regarded as transition phases in the evolution of the understanding of its changing meaning, especially under the influence of such a process as internationalisation (Nazarczuk, 2008). These problems are also highlighted in the description of the ongoing systemic changes in Poland (Krugman, et al., 2014; Zinnes, Eilat & Sachs, 2001; Kaczmarek, 2016).

Competitiveness originates from competition – it is its materialisation and results in changes in the competitive position of the organisation (Reynauld & Vidal, 1998). They demonstrate the organisation's ability to effectively achieve its objectives (Frischtak, 1999), while highlighting the impact of competitiveness on the harmonisation of its stakeholders' objectives (Bossak, 2006). In a broad sense, the competitive position is one

of the links in the competitiveness chain – it is complemented by instruments of competition, competitive advantage and potential of competitiveness (Stankiewicz, 2000).

However, views on the nature and structure of competitiveness are mixed (Obłój, 1998), which results from different research approaches formulated in relation to competitive markets (Dunford, et al., 2001). This research concerns both the competitive struggle between operators and their ability to maintain or increase their market shares (Feenstra, 1989). Generally speaking, there are four main trends in competitiveness research that can be subsumed from the opinions expressed: in the area of economic growth theory, international trade, distortions and competition (Wziątek–Kubiak, 2003). However, it is more often analysed in the context of management sciences (the way of gaining competitive advantage) than in the discipline of economics (relating to the increase in the efficiency of entities and economic growth).

Many opinions argue that competitiveness is a purely microeconomic category, as a country cannot be eliminated from the market, as indicated by P. Krugman, as a goal of competition (Krugman, 1994b). Moreover, the competitiveness of countries is shaped by factors other than production efficiency, which contradicts the concept of M.E. Porter's competitive advantages. However, it is subject to criticism (Foss & Mahnke, 1998; Kraft, 2000), and M.E. Porter's views also point to an evolution in this respect (Porter, 2008), which broadens the scope of discussion.

The visible stratification of the notions of competitiveness leads to the conclusion that from the subjective point of view, competitiveness is multifaceted. The following can be distinguished: mega scale (group of countries), macro scale (state), meso scale (sector, industry), micro scale (enterprise), micro scale (product) (Dzikowska & Gorynia, 2012). Developing, at the micro and meso levels, a static approach is visible (photographic – level, rank, result), while at the macro and mega levels, it is dynamic (tomographic – ability to compete in the long run) (Bieńkowski, 2007). In the opinions in question, microeconomic competitiveness itself (most often surveyed) is also multifaceted (Faulkner & Bowman, 2000), with a possible distinction being made between competitiveness in the sense of the largo and in the strict sense (Galli & Pelkmans, 2000), while the mesoeconomic level is the least defined and researched (Olczyk & Daszkiewicz, 2008).

The processes of internationalisation (globalisation and integration), the development of knowledge and the information society, deregulation, liberalisation, the development of financial markets and instruments, the development of technology and a new explosion of innovation, the universality and speed of information transfer are characteristic features of the modern economy. As a result, the technical and economic conditions for international competition have changed (Naisbitt, 1984). We should agree with the view that these processes have not only made competition more intense, but have also made it possible to create and distribute more and more added value on a global scale (DeVet, 1993; Yang, 1995).

Currently, the competitive advantage is determined by the dispersion of resources, specialisation of operations and interdependence in operation, and radical changes cancel out previously developed skills (in accordance with the concept of creative destruction of J.A. Schumpeter) (Cyrson, 2002). The value chain is no longer a new centre and competitive advantage, but a module (one or more links in the value chain linked to outsourced activities). Further value chain modules are the basis for creating new activi-

ties and migrating to new markets (Hitt, et al., 1998), and so the vertically integrated value chain is decomposed. Semi–permeable borders are emerging, and new, loose links between entities are emerging – virtual organisations, network organisations, modular organisations (Makadok, 1998).

The concept of average competitive advantage in the chain and the concern for the efficiency of the entire value chain are not sufficient today to describe the rapidly changing economic reality. The point of reference for competition is no longer an industry. There are clusters of enterprises, clusters of competitive sectors (clusters), which emphasize the mesoeconomic perspective of understanding processes taking place in the economy (Best, 2015).

The economic structure is a specific type and arrangement of elements of the economy that make up the whole and the set of relations between them – the relation between elements and between elements and the whole. Its analysis from the point of view of the degree and level of aggregation distinguishes between macro, meso and microstructure. The most common field of exploration is changes in economic macrostructures – in order to search for the general correctness of these changes. Mesostructure research is very rare. The barriers are informational constraints, a multiplicity of elements and structural relationships. However, contemporary economic knowledge provides many prerequisites for undertaking research at the mesoeconomic level – in order to understand the process of economic development and identify its effectiveness factors, attention should be focused not on the macrostructure, but on its elements (Kaczmarek, 2012).

The mesostructure of the economy includes a layer of elements and structural relationships between the macro and micro levels. Numerous processes taking place in it characterise and shape its effectiveness, affecting not only the macro but also the microstructure of the economy (interaction) (Janasz, 2006). It is therefore necessary and desirable to study the interdependence between the dynamics of effectiveness and those of the processes shaping it at the mesoeconomic level. This is particularly true in the case of the transformation period economy, which is still the case in Poland. The key development processes are: structural changes, growth of competitiveness, restructuring and development of entrepreneurship and enterprises. In the article the subject of interest is competitiveness.

The ambiguity of the definition of competitiveness translates into its assessment, in which theoretical measures are much broader than the possibilities of their application in practice. At the macroeconomic level, synthetic, simplified or partial measures are used, developed. Another method of evaluation is the use of multi–indicator analysis with a weighting system and determination of a synthetic index (Zinnes, Eilat & Sachs, 2001). Microeconomic competitiveness assessment uses measures of efficiency (financial results and share of export sales), sources of building competitiveness potential and ways of shaping the microenvironment. From among the four previously distinguished streams of research on competitiveness, two ways of assessing changes in competitiveness are most often used. In the first case, coverage ratios (export to import ratios) and export ratios (export commodity structure) are used. In the latter case, competitiveness is assessed by examining relative price movements, efficiency changes (total productivity, unit costs, labour costs) and changes in export share indices (Marsh & Tokarick, 1994; Aiginger, 1998). This method of assessment has become a premise for the development of a method for measuring competitiveness at the mesoeconomic level, which is the subject of research in the article.

The review of the literature indicates a significant gap of knowledge, mainly in the field of empirical cognition, referring to the study of competitiveness at the mesoeconomic level. The numerous constraints on the limited access to figures, as well as the multiplicity of elements necessary to cover the analysis and their structural links, are the main reasons for this gap and for this reason the research has to be undertaken. Their results are presented in the article. For the purposes of these studies, the objectives referred to in the introduction to the article have been defined. They became the basis for the formulation of research questions, and the proven hypotheses for the Polish economy are:

H1:   Development of manufacturing mesostructure is characterised by phase, objects diffusion and increasing permanency of their rank positions.

H2:   Factor of manufacturing mesostructure competitiveness growth is based on export rather than labour productivity.

H3:   Profiles of manufacturing submesostructures according to enterprise size classes are different.

METHODOLOGY OF MESOSTRUCTURE RESEARCH

In the article, I presented, as the key information, the results of own research of manufacturing mesostructure characteristics in the Polish economy in 1990–2017, considering the assessment of its competitiveness. The PKD divisions constitute the objects of tested mesostructure being created completely of units i.e. enterprises (all group research)[1]. I applied my own model in the survey and constructed the multivariate (synthetic) competitiveness measure (CM) (Fig.1).
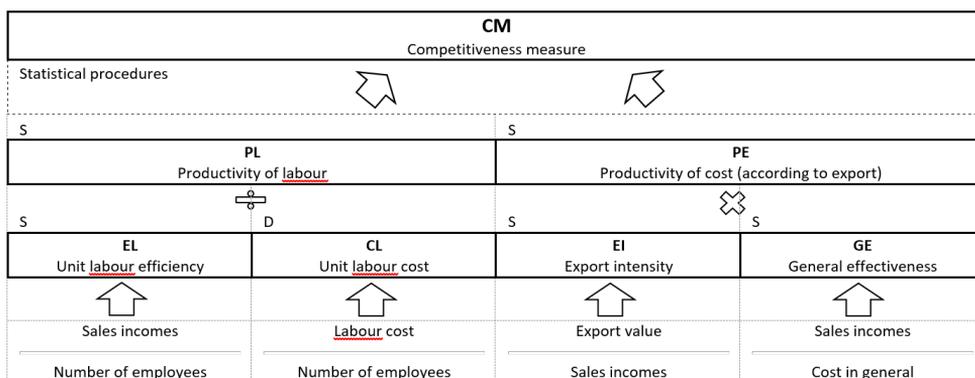
Figure 1. Elements of research and construction scheme of competitiveness measure (CM)
Notes: S – stimulant, D – destimulant. For the higher values of CM – positive, high assessment.
Source: own elaboration.

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[1] Privately paid research – whole group of enterprises included in the public statistics (unit data). In 2007–2017 (classification of PKD 2007) the research included 14,290 enterprises – non–financed subjects of number of employees from 10 people who submitted the statistical statement F–01/–01and F–02 and SP) in scope of 24 PKD divisions of industrial manufacturing. For years 1990–2007 (classification of PKD 2004), it included 14,974 enterprises and 22 PKD divisions. The share of manufacturing enterprises in research in the value added of manufacturing activity equals 61.9%. The source of primary figures: commercial data base of PONT Info – Gospodarka (SŚDP).

This measure uses four factor elements creating two partial measures and the statistic procedures aimed to describe a multivariate measure.

In its construction, the objects were transferred at first from the original multidimensional space to the new one that was created as the result of applying the linear transformation on axes of original coordinate system (standardisation). Further, the destimulants were changed into the stimulants and their negative values were eliminated by scalar subtracting (variable negative value). Finally, the Euclidian distance d_{i0} was determined for the particular objects from the coordinate of anti–pattern which created the beginning of coordinate system in this case. All of this created multivariate measurement presented by the formula:

$$d_{i0}(CM) = \sqrt{\sum_{j=1}^{K}(x_{ij} - x_{0j})^2} \tag{1}$$

where:

$x_{0j} = (0, \dots, 0)_K$;

K - number of multivariate measure components ($j = 1, \dots, K$).

In the field of competitiveness measure (CM), the characteristics and results of the following areas are mixed: efficiency and unit cost of labour[2] as well as export intensity and general effectiveness[3].

Cost of labour (CL) and unit efficiency of labour (EL) are crucial economic relations describing the use of human labour factor. Their size, and primarily the direction and dynamism of changes (CL advance factor by EL) enable to explain the value of result in the form of productivity of labour cost stream (PL).

The intensity of export activity (EI) quantifies the share in the international division of labour and is the element of position assessment and competitive ability of economic unit. Using the measure of overall cost measure, the general effectiveness (GE) of its functioning can be assessed. Relating these two factors with each other, the strength of their impact on result size (cost productivity in regard to export – PE) and the level of advance level of factors (GE by EI) were tested.

The analysis and assessment included density of mesostructure objects, position of focal point[4] and its way. The classification of objects was also conducted. It was performed with the use of average rank position[5] and its variability[6]. Other four groups of objects (normative patterns) are characterised in the scope of competitiveness (CM) by: I – high and stable position, II – high position of significant variability, III – low but stable position, IV – low position of significant variability[7].

During survey, the test of similarity level of manufacturing mesostructure profiles was conducted with the application of average rank position, variability of this position

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[2] Unit efficiency of work is described by the relation of incomes in general to the number of employees and the unit cost of work by the relation of work cost (cost of remuneration, social insurance and other) to the number of employees.

[3] Intensity of export is described by the relation of incomes from export to incomes in general, and effectiveness is defined as the relation of incomes to the cost in general.

[4] The mesostructure focal point is expressed by the reference of sums of objects factors sizes (and not result–related).

[5] As the solution of problem with related ranking, the method of average rank was chosen. The rule was to assign the smallest ranking value to the highest value of analysed measure.

[6] The standard deviation was applied as the variation measure. Lower values of deviation are accompanied by observations being closer to the average (lower variation).

[7] The groups are divided by the average ranking position of 12 and standard deviation – 3.

and normative models. The criterion used to extract the submesostructures was the class of enterprises size (small, medium, large)[8].

The density of objects was checked with the use of density factor (DF) elaborated. It is counted as the square root of covariation matrix determinant and described by the formula:

$$F = \sqrt{s_x^2 s_y^2 \cdot \left(1 - r_{xy}^2\right)} \tag{2}$$

where:

s_x^2, s_y^2 - variance of determinant *x*, variance of determinant *y;*
r_{xy}^2 - Pearson linear correlation factor between *x* and *y*.

The value of this factor is proportional to area of ellipse including the tested set of objects on the level.

The broader discussion on the methodological terms concerning the competitiveness measurement can be found in (Kaczmarek, 2012).

The determinism attitude – logarithm method – was used in the casual research. The starting point was the state of balance between the dynamism of defined variable (D_Y), and the ratio of dynamics of defining variables ($D_{X1}, D_{X2},…, D_{Xn}$).

$$D_Y = D_{X1} \cdot D_{X2} \cdot … \cdot D_{Xn} \; ; \; \log D_Y = \log(D_{X1} \cdot D_{X2} \cdot … \cdot D_{Xn})$$

$$R_Y = \frac{\log D_{X1} + \log D_{X2} + … + \log D_{Xn}}{\log D_Y} = 1$$

$$R_{X1} = \frac{\log D_{X1}}{\log D_Y} \; ; \; R_{X2} = \frac{\log D_{X2}}{\log D_Y} \; ; \; … \; ; \; R_{Xn} = \frac{\log D_{Xn}}{\log D_Y} \tag{3}$$

$$R_Y = R_{X1} + R_{X2} + … + R_{Xn}$$

The application of logarithm function allows for transforming the sequence of defining variables dynamism product into the sequence of sum and further, the comparison of logarithm of defining variable with the unit. In the same way, the partial deviations are indicated (R_X) as the indicators of the structure describing the share of defining variables in the influence on the defining variable (R_Y).

In the test of independence of phenomena (time series), the critical level of significance was α=0.05 compared with the test probability (p–value). P–value being lower than the critical level of significance enables to act ad hoc as if the null hypothesis of no correlation was rejected. The applied measurement of correlation is r–Pearson coefficient (r), and the measure of variation is standard deviations (σ).

FINDINGS AND DISCUSSION

Intensity of change processes in transition countries

In the article, the CEB transition countries (nine, including Poland) and three countries of SEE[9] group, are the subject of analysis of transition processes (marked as ET–12[10]). An

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[8] SSE (small–size enterprises) – 10 to 49 employees, MSE (medium–size enterprises) – from 50 to 249 employees, LSE (large–size enterprises) – above 249 employees.
[9] CEB – Central Europe and the Baltic States, SEE – South–Eastern Europe.

assessment of the intensity of these processes is provided using[11] a transition rate (TR)[12]. Its broadening is the assessment of structural changes – SC[13] measure. The assessments constitute the background for the competitiveness analysis.

The intensive transformation changes in the ET–12 countries took place in the 1990s, including the decrease in dynamics and proceeding stabilization. From 2012, their dynamism lapsed in fact.

Entering onto the way of changes, the countries of ET–12 were characterised in 1989 by the value of transition rate (TR) – the average constituted barely 30% of level of EU15 countries (the countries of "past" EU – 4.3). Five countries were distinguished: Slovenia, Croatia and Serbia, Poland and Hungary. After 28 years of transformations, the average value for the ET–12 countries increased almost 3–times reaching the level of 88% of EU15 countries. In 2016, the leader was Estonia, and then Poland, Hungary, Czech Republic and Slovakia.

Except Serbia, the changes proceeded in a rather narrow transition channel. In its scope, the process of changes was rather varied for the countries, distinguishing the models and strategies of their implementation (Kaczmarek, 2016) (Fig. 2).

Weakening of transition dynamism from 2012 described by transition rate (TR) – or in fact its stopping – is confirmed also by the low dynamism of structural changes (SC). The noticeable and positive changes that occurred in 2010–2016 concerned the road infrastructure, MSME financing and the application of natural sources of energy. Worsening concerned the production of electric energy, railway infrastructure and insurances and other financial services.

Saturation of structural changes is strongly varied – ET–12 countries are assessed highly for the changes in industry, real estate market and ICT. They are still weak at the development of road infrastructure, agriculture and balanced energy production. The greatest distance to the EU15 countries concerns the development of financial sector – MSME financing, capital market and Private Equity.

The differences between the ET–12 countries are clear – Czech Republic, Estonia, Poland and Slovakia (this one showed the highest positive average annual pace of structural changes) are the leaders. However Hungary has significantly withdrawn from its level in recent years (Fig. 3).

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[10] Poland – POL, Czech Republic – CZE, Slovak Republic – SVK, Hungary – HUN, Estonia – EST, Lithuania – LTU, Latvia – LVA, Croatia – HRV, Slovenia – SVN, Serbia – SRB, Bulgaria – BGR, Romania – ROU.

[11] Methodology of research and construction of indicators available for the publication series of Transition Report, EBRD, London. For 2015–2016 own research using EBRD methodology. http://www.ebrd.com/what–we–do/economic–research–and–data/data/forecasts–macro–data–transition–indicators/methodology.html, access on: 28.03.2018.

[12] TR measure includes 6 partial measures: Governance and enterprise restructuring, Price liberalization, Trade and Foreign exchange system, Competition Policy, Small scale privatization, Large scale privatization. Point–based grading scale 1.0–4.5.

[13] SC measure includes 16 partial measures collected in four groups: Corporate sectors: AB – Agribusiness, GI – General industry, RE – Real estate, ICT – Information and communication technologies, Energy sector: NR – Natural resources, SE – Sustainable energy, EP – Electric power, Infrastructure sector: WW – Water and wastewater, UT – Urban transport, RO – Roads, RA – Railways, Financial sectors: BA – Banking, IN – Insurance and other financial services, MSME – Micro–Small–Medium Enterprises finance, PE – Private equity, CP – Capital markets. Point–based grading scale 1.0–4.5.
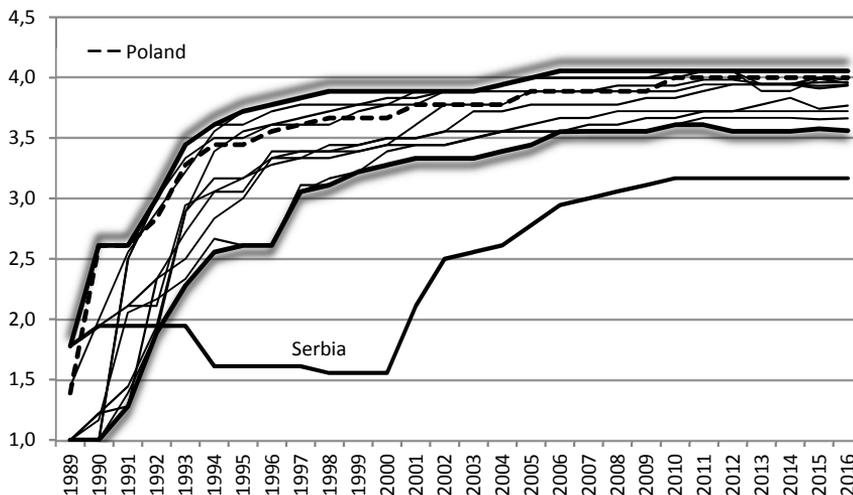
Figure 2. Values of transition rate (TR) of ET–12 countries in 1990–2016
Source: own elaboration based on: http://www.ebrd.com/what–we–do/economic–research–and–
data/data.html, access on: 18.03.2018; for 2015 and 2016 own calculations based on EBRD methodology and
data bases: http://ec.europa.eu/eurostat/data/database, access on: 12.03.2018; https://data.oecd.org, access
on: 14.03.2018; http://www.imf.org/en/data; http://data.worldbank.org, access on: 14.03.2018.
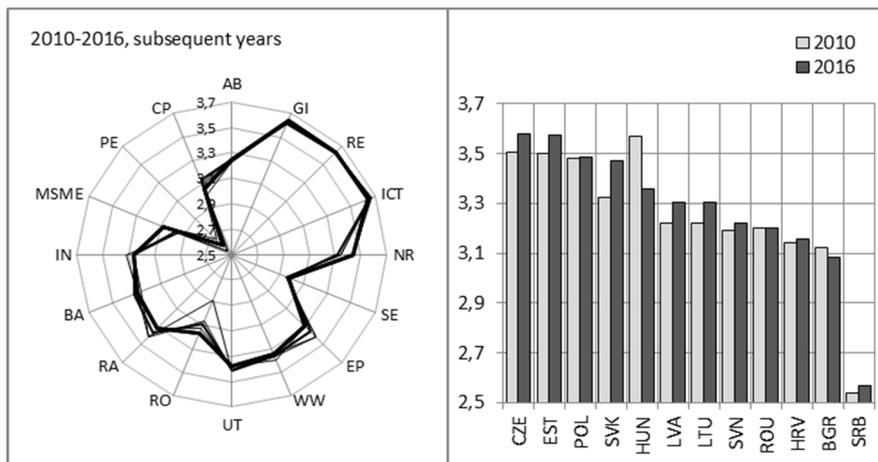
Figure 3. Value of structural changes measure (SC) for ET–12 countries in 2010–2016
Notes: AB – Agribusiness, GI – General industry, RE – Real estate, ICT – Information and communication tech-
nologies, NR – Natural resources, SE – Sustainable energy, EP – Electric power, WW – Water and wastewater,
UT – Urban transport, RO – Roads, RA – Railways, BA – Banking, IN – Insurance and other financial services,
MSME – Micro–Small–Medium Enterprises finance, PE – Private equity, CP – Capital markets.
Source: same as Figure 1.

Macroeconomic competitiveness

The place of Poland on the map of economic transformation – of accomplished transition and structural changes – has been still high, including the group of ET–12 countries. The pillar for development is competitiveness – it is also the main aim of transformational changes. Poland took the 39th place in the rank of World Economic Forum in 2017 edition of research (key data for 2016) according to GCI (Global Competitiveness Index[14]). In reference to place from the beginning of 1990s, it is a significant improvement.

Poland with its GCI value of 4.59 (18th place in Europe) achieved 78.3% of leader's result (Switzerland), 81.2% of Germany's result – its greatest trade partner, and 91.4% of the EU15 result. In the group of analysed ET–12 countries, Poland is taking third place after Czech Republic and Estonia. In 2007–2017, it achieved 7.4% of competitiveness assessment but the leader of dynamism of changes in the group was Bulgaria (14.5%) and then Romania (8.3%) (Fig. 4).

It is important to look at its structure, i.e the creating factors. GCI measure is supported by 12 pillars[15] built on 114 variables. The countries of EU15 are characterised by the relatively balanced system of competitiveness pillars. The greatest predominance is shown by pillar 4 (Health and primary education) and 9 (Technological readiness), 2 (Infrastructure) and 5 (Higher education and training). In this background, the distance of Poland to EU15 model (average) indicates the predominance only for pillar 10 (Market size) and 3 (Macroeconomic environment). However, the significant shortages (above 10%) concern six pillars: 12 (Innovation), 1 (Institutions), 11 (Business sophistication), 2 (Infrastructure), 9 (Technological readiness) and 7 (Labor market efficiency). The image of competitiveness potential structure achieved by Poland is close to the development of Italy and Spain, but distant from Germany (referring to the level and degree of competitiveness pillars balance). These characteristics are also appropriate for description of the differences between the model (average) of ET–12 countries and EU15 countries.

Within last ten years (data available from 2007), the countries of ET–12 expressed the improvement in pillars 2–6 and 9–10, stagnation in pillar 12, and decrease in pillars 1, 7, 8 and 11. The visible success are only the changes in pillar 2 (Infrastructure) and 9 (Technological readiness). In that time, Poland showed the decrease of pillar 7 (Labor market efficiency) and 8 (Financial market development). The situation has improved in other pillars, but the significant change occurred only in pillars 2 and 9 (Fig. 5).

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[14] Methodology of research and construction of indicators available for the publication series of The Global Competitiveness Report, WEF, Geneva. http://reports.weforum.org/global–competitiveness–index–2017–2018/#topic=methodology, access on: 29.03.2018.

[15] Pillars of GCI include: 1– Institutions, 2 – Infrastructure, 3 – Macroeconomic environment, 4 – Health and primary education, 5 – Higher education and training, 6 – Goods market efficiency, 7 – Labor market efficiency, 8 – Financial market development, 9 – Technological readiness, 10 – Market size, 11 – Business sophistication, 12 – Innovation.

Country	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
CZE	4,6	4,6	4,7	4,6	4,5	4,5	4,4	4,5	4,7	4,7	4,8
EST	4,7	4,7	4,6	4,6	4,6	4,6	4,7	4,7	4,7	4,8	4,8
POL	4,3	4,3	4,3	4,5	4,5	4,5	4,5	4,5	4,5	4,6	4,6
LTU	4,5	4,4	4,3	4,4	4,4	4,4	4,4	4,5	4,5	4,6	4,6
BGR	3,9	4,0	4,0	4,1	4,2	4,3	4,3	4,4	4,3	4,4	4,5
SVN	4,5	4,5	4,6	4,4	4,3	4,3	4,3	4,2	4,3	4,4	4,5
LVA	4,4	4,3	4,1	4,1	4,2	4,3	4,4	4,5	4,5	4,5	4,4
SVK	4,4	4,4	4,3	4,2	4,2	4,1	4,1	4,1	4,2	4,3	4,3
HUN	4,4	4,2	4,2	4,3	4,4	4,3	4,2	4,3	4,2	4,2	4,3
ROU	4,0	4,1	4,1	4,2	4,1	4,1	4,1	4,3	4,3	4,3	4,3
HRV	4,2	4,2	4,0	4,0	4,1	4,0	4,1	4,1	4,1	4,2	4,2
SRB	3,8	3,9	3,8	3,8	3,9	3,9	3,8	3,9	3,9	4,0	4,1
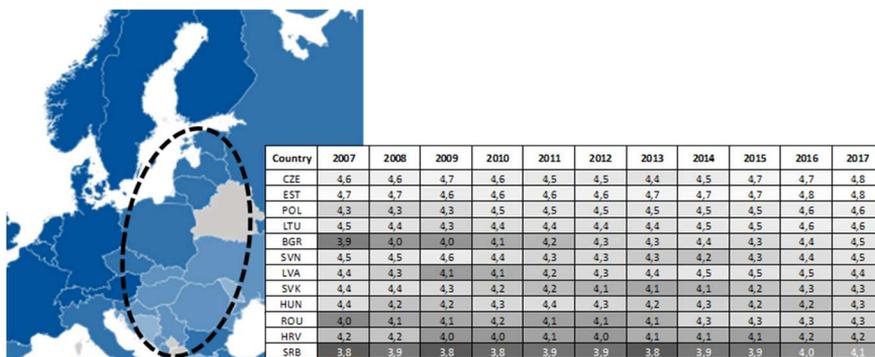
Figure 4. Competitiveness 'heat map' (GCI) for ET–12 countries in 2007-2017
Source: own elaboration based on The Global Competitiveness Report (2006/2007 … 2017/2018,
http://reports.weforum.org/global–competitiveness–index–2017–2018/#topic=data, access on: 29.03.2018.

Figure 5. Competitiveness measure (GCI) for Poland and group of countries in 2007 and 2017
Notes: 1– Institutions, 2 – Infrastructure, 3 – Macroeconomic environment, 4 – Health and primary education,
5 – Higher education and training, 6 – Goods market efficiency, 7 – Labor market efficiency, 8 – Financial mar-
ket development, 9 – Technological readiness, 10 – Market size, 11 – Business sophistication, 12 – Innovation.
Source: https://www.weforum.org/reports/the–global–competitiveness–report–2017–2018,
access on: 29.03.2018.

Intensity of export and general effectiveness

The long horizon of productivity observation (PE) enabled to separate three phases of
changes as the result of research. The first one is started by the period of transforma-
tional recession (1990–1992) with the rapid decrease of PE value and its both factors (EI
and GE). Then, the stabilization and gradual increase of PE started from 2000, with the
still worsening general effectiveness (GE). The second phase (from 2007) was a rapid
growth of export intensity (EI) and the improvement of general effectiveness – the level
of productivity PE increased significantly. In 2008, the short–term negative effects of
crisis started to be noticeable. In 2009, the increase of productivity PE started due to the
increase of EI, and stabilization of GE (3rd phase). In the analysed period (1990–2017)
factor EI revealed very strong and statistically significant correlation with the result
measurement PE (r=0.99, p–value=0.00…<α=0.05) (Fig. 6, left panel).
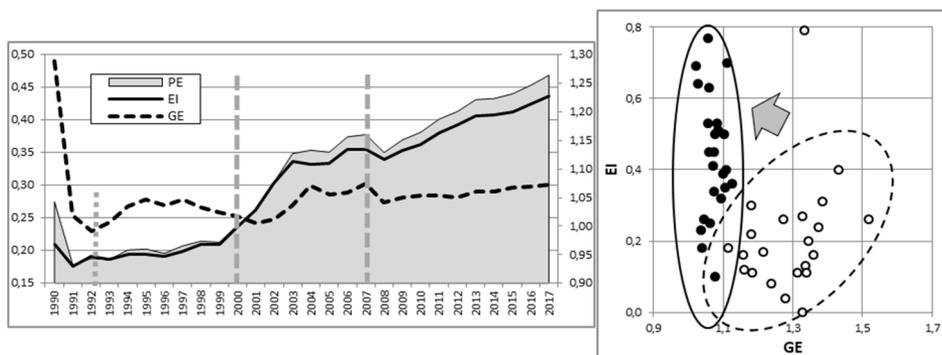
Figure 6. Productivity factors of PE of manufacturing mesostructure in 1990–2017 (left panel) and the change of its objects positions (right panel)
Notes: values of measures given as non–nominated. PE – Productivity of cost (according to export),
EI – Export intensity, GE – General effectiveness (right axis).
Source: own elaboration based on commercial data base of PONT Info – Gospodarka (SŚDP),
http://baza.pontinfo.com.pl/index.php, access on: 29.03.2018.

The mesostructure at the beginning of transformation period in the scope of PE productivity (after the shock and transformational recession) is the collection of objects without any significant grouping, rather quite diffused. The results of observation in 2017 draw attention to the assimilation of mesostructure objects regarding to the factor GE and factor EI became the factor differentiating the objects (Fig. 6, right panel).

The way to focal point of mesostructure can be divided into three fragments: 1990–1992 – decrease in EI value especially GE, 1999–2003 – significant increase in EI value and lower increase in GE, 2009–2016 – increase in EI value and stabilization of GE. There are two periods of changes, visible between these fragments, without a clear tendency (multiple changes of direction). Therefore the most advantageous and intensive period of mesostructures transformation with regard to PE was the 1999–2003 period and the second phase of changes (before and at the beginning of entering into EU). The last phase had strong and dominant impact on factor EI.

The densification of objects had lasted until 1997, and then with the changeable intensity, the process of their diffusion started to proceed especially between 2010–2012. The conducted test of time series correlation of measurements DF and PE indicated the weak and statistically insignificant dependence (r= –0.26, p–value=0.0753>α=0.05).

Labour cost and efficiency

In the longer perspective, from the point of view of labour cost productivity (PL), I distinguished three phases of changes. The first one (1990–2001), with the starting period of transformation recession is the alternating fluctuation of PL with slightly progressive trend – from 1993, the efficiency (EL) and unit cost of labour (CL) started to increase. The second phase – there is a significant growth of PL from 2002 until 2011 (disturbed by the observation of financial crisis in 2007). The dominating years are those with the value of CL pace advance rate by EL above the unit (positive assessment). The third phase – from 2012, PL reveals the downward trend with decrease in EL and continuous increase in CL

(negative assessment). In the analysed period (1990–2017), EL factor showed really strong and statistically significant correlation with PL measure (r=0.91, p–value=0.00…<α=0.05) (Fig. 7, left panel).
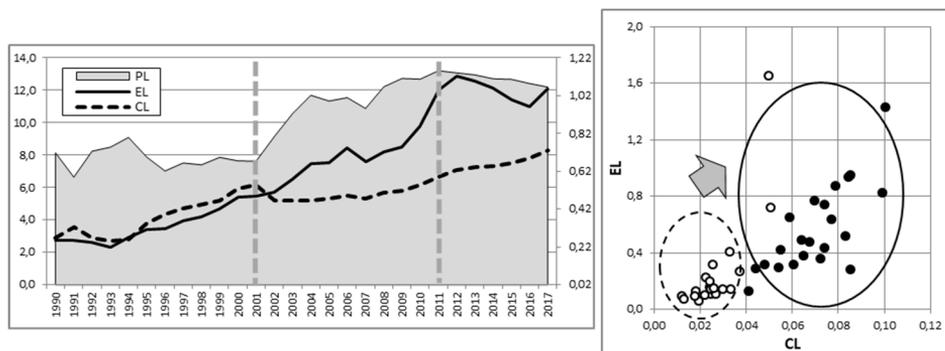
Figure 7. Productivity factors of PL of manufacturing mesostructure in 1990–2017 (left panel) and the change of its objects positions (right panel)
Notes: measure values given as standardised. PL – Productivity of labour,
EL – Unit labour efficiency, CL – Unit labour cost (right axis).
Source: same as Figure 6.

The mesostructure of the transformation beginning (in the scope of productivity PL) is the collection of objects being clearly dense. The results of observations in 2017 draw attention to diffusion of mesostructure objects – more in regard to EL than CL (Fig. 7, right panel). The access to this image is described by the way of mesostructure focal point being divided into four characteristic fragments: 1990–2001 – close to the proportional changes of EL and CL, 2002–2006 –increase of EL and stabilisation CL, 2008–2012 – changes of EL and CL being close to proportional ones again, 2013–2017 – increase of CL with the decrease of EL. The most advantageous and intensive period were years between 2001–2006 in the second phase of changes (before and at the beginning of entering into the EU). However, the third phase is rather the period of clearly non–beneficial changes.

There was an increase in density factor value in 2004–2012 (DF) – the objects started to move away from each other in regard to the faster increase of EL factor than CL. After 2012, the mesostructure started to become more dense. The performed test of time series measure correlation of DF and PL showed the strong and statistically significant correlation (r=0.81, p–value=0.00…<α=0.05) – the increase of objects diffusion DF occurred jointly with the increase of productivity PL.

The way of manufacturing mesostructure transformations and variation of its objects

H1: Development of manufacturing mesostructure is characterised by phase, objects diffusion and increasing permanency of their rank positions.

The results of long–term research conducted in 1990–2017 let me distinguish clearly the phases of mesostructure changes from the point of view of intensity of competitiveness measure value changes (CM):

1. 1990–1999 – low increase of CM with relatively small fluctuations of PE and greater of PL (decrease after 1994) and concentration of mesostructure at the end of phase,
2. 2000–2006 – high upward trend (until 2004) and further lower intensity of changes CM, its components and DF,
3. 2007–2017 – leap increase of diffusion and stable increase of CM and PE with the decrease of PL from 2012 and stabilization of DF.

The second phase of changes was the most dynamic and advantageous for mesostructure with its strong influence of PL factor at the beginning (the period before and at the beginning of joining EU) and slowing down the CM growth path in 2007–2008. From the half of third phase, with the decrease of PL factor value, PE factor constituted foundation for the increase of CM. The additional statement appropriate for years 1990–2017 is greater amplitude of fluctuations of PL factor rather than PE despite the fact that the second one constitutes the channel connecting the stream of mesostructure exchange with the international environment, defined commonly as more changeable (Fig. 8).
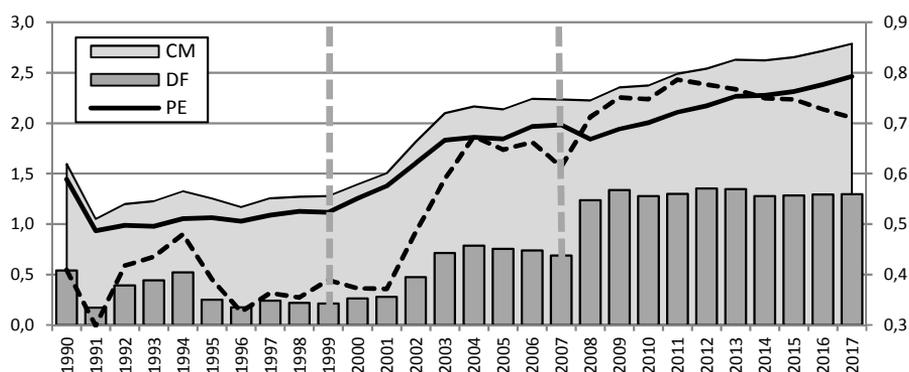
Figure 8. Competitiveness measure (CM), its components and concentration (DF) of manufacturing mesostructure in 1990–2017
Notes: measure values given as standardised. CM – Competitiveness measure, DF – density factor, PE – Productivity of cost (according to export), PL – Productivity of labour (right axis).
Source: same as Figure 6.

The performed test of correlation of time series CM and DF indicated very strong and statistically significant dependency (r=0.94, p–value=0.00…<α=0.05) – the increase of mesostructure objects diffusion (objects moved away from each other differentiating) referred to the increase of competitiveness.

The image of mesostructure at the beginning and end of analysed period is visible by transition of objects along the PE axis rather than PL and their greater diffusion (Fig 9, left panel). The way of CM focal point indicates the multiple turns from 1998 and the marked regression curve[16] describes the way of changes and indicates those being the most beneficial in 1999–2011. After that period, the regression curve is falling to the PE factor and the way of focal point is showing its increasing influence and decreasing influence of PL (Fig. 9, right panel).

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[16] Cubic polynomial – very good match, R^2=0.93.
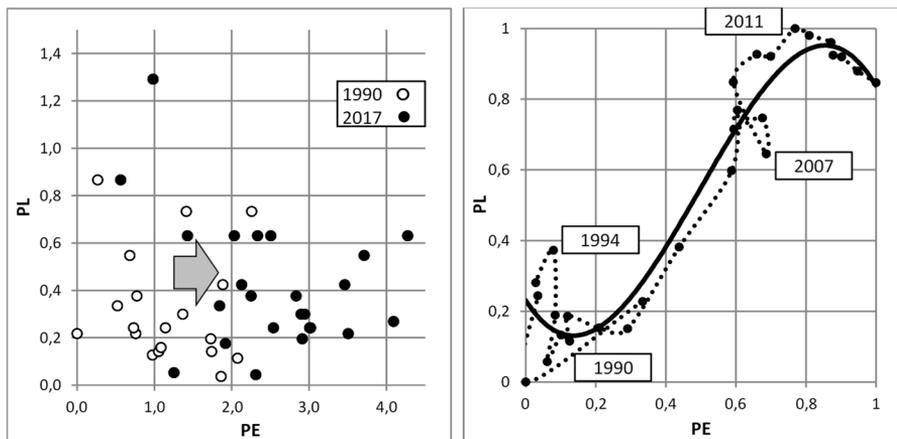
**Figure 9. Distribution of manufacturing mesostructure objects
determined by the factors of competitiveness measure (CM) in 1990 and 2017
(left panel) and the way of focal point (right panel)**
Notes: the way of focal point with the use of unitarized values.
PE – Productivity of cost (according to export), PL – Productivity of labour.
Source: same as Figure 6.

Analysing the obtained results of mesostructure objects ranking, their assessment highlights the division of years between 1990–2017 into three periods: first one (1990–1999) characterised by the visible changes of ranking positions (average variation of ranking position – VRP=2.8), second one (2000–2006) is the image of menostructure of weakening transfer of objects on the ranking lists obtaining gradually the features of permanency (VRP=1.7), third one (2007–2017) is the mesostructure exhibiting the negligible variation – presenting even more clearly the concentration areas of objects having the high permanency (VRP=1.5), especially on the highest and lowest ranking positions (Fig. 10).

The identified property of mesostructure in the form of its increasing permanency finds its reflection in classification of objects from the point of view of average ranking position and its variation. In the first period (years 1990–1999) 31.8% objects were characterised by over average variation of average ranking position (second and fourth group), however in the third period (years 2007–2017) there were only 4.2% of such objects and 45.8% belonged to the first one, and a half (50.0%) belonged to the third group (Fig. 11).

Due to the conducted analysis of mesostructure objects (PKD divisions) formed between 2007–2017, I can enumerate firstly those of over average competitive position and low variation (8 objects), including: manufacturing and processing of coking coal and petroleum products, manufacturing cars, computers, electronic software and optic devices, manufacturing of electronic devices and manufacturing of furniture.

Final ranking positions are allocated to, among others, manufacturing of juice, manufacturing of paper and paper products, manufacturing of metals, production of food products, production of basic pharmaceutical substances and medicines.

PKD Division	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
23	2	1	1	1	1	3	4	4	5	5
34	20	20	14	7	7	8	6	9	7	7
32	15	22	21	19	16	10	5	2	1	1
16	12	10	13	9	9	13	19	20	15	17
36	10	4	4	4	3	2	2	3	3	3
35	3	2	2	2	2	1	1	1	2	2
31	6	6	6	8	11	7	8	6	6	6
29	9	13	11	13	15	17	17	15	16	18
20	11	9	7	6	6	12	11	11	9	9
25	17	18	16	16	14	18	15	14	14	15
21	21	11	9	11	10	6	7	10	8	10
27	8	5	5	5	5	9	12	8	11	11
28	13	12	10	14	18	15	13	13	13	12
18	7	7	3	3	4	4	3	5	4	4
24	4	3	8	10	8	11	10	12	12	13
17	18	19	19	18	20	20	20	19	17	16
19	16	15	15	20	19	14	14	16	18	14
33	5	16	18	21	21	21	21	21	21	21
26	19	17	17	15	13	16	16	17	20	20
15	14	14	12	12	12	19	18	18	19	19
30	1	8	20	17	17	5	9	7	10	8
22	22	21	22	22	22	22	22	22	22	22

2000	2001	2002	2003	2004	2005	2006
4	4	2	1	1	1	1
3	2	1	2	2	2	2
1	1	3	3	3	3	3
20	20	7	8	4	5	4
5	3	6	4	5	4	5
2	5	4	6	7	6	6
6	6	5	5	6	7	7
16	16	15	14	14	12	8
8	8	8	10	8	8	9
13	12	11	13	12	11	10
9	9	12	11	9	10	11
12	13	17	15	10	13	12
11	10	13	12	13	9	13
7	7	9	9	11	14	14
10	14	16	16	16	15	15
15	15	14	17	15	16	16
14	11	18	18	17	17	17
21	21	21	19	18	18	18
18	18	20	20	20	20	19
19	19	19	21	19	19	20
17	17	10	7	21	21	21
22	22	22	22	22	22	22

PKD Division	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
19	1	1	1	1	1	1	1	1	1	1	1
29	2	2	2	2	2	2	2	2	2	2	2
26	3	4	4	4	3	3	6	5	3	3	4
30	4	5	5	6	6	6	3	4	6	4	3
27	6	3	3	3	5	5	5	6	5	6	6
31	7	6	7	5	4	4	4	3	4	5	5
15	10	9	12	11	8	9	8	8	8	8	10
28	8	8	8	8	9	11	11	11	11	10	7
32	9	13	9	15	11	7	9	7	7	7	9
22	14	10	10	9	10	10	7	9	10	9	11
13	16	14	13	13	7	8	10	10	9	12	8
12	5	7	6	7	12	12	13	19	19	19	21
20	12	11	14	12	14	13	14	12	13	13	14
24	11	12	17	14	13	14	15	13	12	11	12
25	18	17	15	17	16	15	12	14	14	14	13
17	13	15	11	10	15	17	17	16	15	18	18
14	17	18	18	18	17	16	16	15	16	15	15
16	15	16	16	16	19	18	18	18	18	16	16
21	20	20	19	19	18	19	19	17	17	17	17
18	19	22	22	21	20	22	20	20	20	20	19
10	23	21	21	20	22	20	21	23	22	22	22
23	21	23	23	22	23	23	22	21	21	21	20
11	22	19	20	23	21	21	23	22	23	23	24
33	24	24	24	24	24	24	24	24	24	24	23

**Figure 10. Ranges determined for the objects of manufacturing mesostructured
in regard to the competitiveness measure (CM) in 1990–2017**

Notes: objects included into the last six are marked with dark grey, and light grey – first six objects of
mesostructure. From 2007, there is a new classification of PKD divisions (mesostructure objects).
Source: same as Figure 6.

Left panel (Standard deviation vs Average rank position):
III – 36,4%   IV – 18,2%
I – 31,8%   II – 13,6%

Right panel (Standard deviation vs Average rank position):
III – 50,0%   IV – 4,2%
I – 45,8%   II – 0,0%
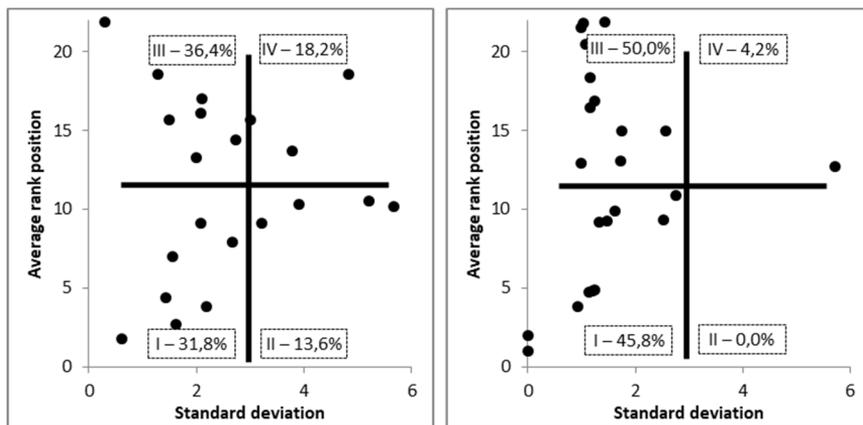
**Figure 11. PKD divisions of manufacturing mesostructure in regard
to the average ranking position of value of competitiveness measure
(CM) and its variation in 1990–1999 (left panel) and 2007–2017 (right panel)**
Source: same as Figure 6.

The detailed analysis in regard to the object of activity can be the subject of further multidimensional research.

H2: Factor of manufacturing mesostructure competitiveness growth is based on export rather than labour productivity.

Referring to the aforementioned results of research concerning the features of manufacturing mesostructure in the scope of phase, diffusion of objects and permanency of ranking positions, I could sublime the results concerning the impact of defined factors on competitiveness – i.e. productivity of labour cost (PL) and productivity of cost in regard to export (PE).

The average pace of PE factor changes in 1990–2017 was highly lower (2.0%) than the PL factor (2.1%), but the dominance of pace of the first one took place in 17 per 27 tested annual periods (63.0%). The cause–effect research in the dynamic regard (determinism attitude, logarithm method) revealed that the factor of mesostructure competitiveness growth correlated with diffusion of its objects (that earlier was proved) is in the scope of productivity in greater degree than on the side of export (PE – 74.5%) than of labour (PL – 25.5%).

The mesostructure of economics shaped in the process of transformation is based mainly on development of export (exogenic factor) and its effectiveness using the comparative difference in cost, including in the cost of labour. However productiveness of labour is low and does not prove the strength of mesostructure. Moreover, recent years have brought weakening of this factor, subordinating the mesostructure even more from export activity. Endogenic factor of competitiveness growth has been neglected then.

Profiles of manufacturing submesostructures

H3:   Profiles of manufacturing submesostructures according to enterprise size classes are different.

The determination of profiles of tested mesostructure was conducted with the application of criterion of enterprise size classes creating its objects (PKD divisions), for the period guaranteeing the comparison of classification of run activity (PKD 2007, years 2007–2017, 3rd phase of changes).

The level of competitiveness (CM) for the submesostructure of medium size enterprises increased in years 2007–2017 by 25.0%, as compared with 16.3% for large entities, and in the smallest degree for small enterprises (6.3%). The average annual dynamics of changes (STZ) also distinguishes the medium enterprises (STZ respectively: 2.26%, 1.52% and 0.62%). The progressive changes in submesostructures revealed a strong and statistically significant correlation with the competitiveness changes for the entirety of manufacturing enterprises in case of medium and large ones (r=0.94 =0.94, p–value=0.00…<α=0.05). This relation was not statistically significant for small–sized enterprises. They are characterized, though, by the highest amplitude of fluctuations in CM measurement and a strong reaction to economic slowdown in 2008–2009 and 2012–2013 (Fig. 12, left panel).

In regard to relation changes in reference to CM value in general, the medium–sized enterprises revealed the improvement by 8.1%, large ones by 0.5%, and small entities recorded worsening by 8.1%. The shares of enterprises sizes shaped in 2017 are almost equivalent with a slight advantage of large–sized enterprises (small–sized 30.3%, medium–sized 33.1%, large–sized 36.6%) (Fig. 12, right panel).

Manufacturing mesostructure reveals the varied profiles for the classes of enterprise sizes regarding the impact of components of competitive measure. PE is permanent and progressive factor of competitiveness for submesostructure of medium– and large–sized enterprises. The stability of this factor is greater for LSE as well as MSE (standard deviation respectively: 0.18 and 0.23). The level of correlation of PE and CM is though really

strong and statistically significant (respectively: r=0.99, =0.95, p–value=0.00…<α=0.05). The other determination concerns decreasing value and strength of impact of PL factor – turning point for the LSE occurred in 2011 and for MSE in 2013. In both cases, the level of PL in 2017 returned to the one from 2008/2009, which shall be negatively assessed.
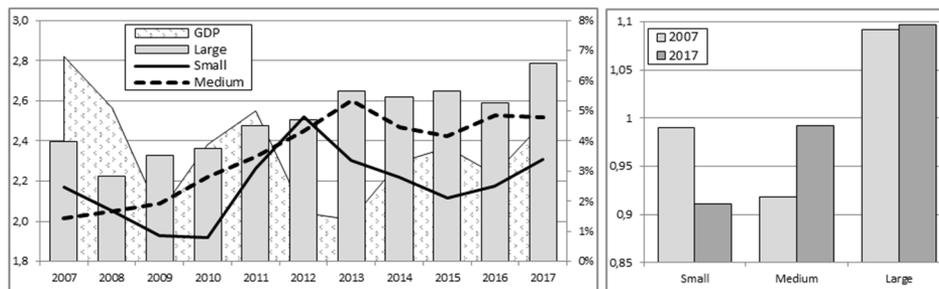
Figure 12. Competitiveness measure (CM) in reference to enterprise size classes of manufacturing mesostructure in 2007–2017 (left panel) and the changes of proportions between them (right panel)
Source: same as Figure 6.

Therefore, the changes in submesostructure of SSE are the significant fluctuations of PL and PE levels. For the last one, the progressive trendline can be marked, but the progressive trendline for PL, apart from the peak in 2012, is not visible. In this class of enterprises, PE factor reveals its strong and statistically significant correlation with changes of MR values as well (r=0.82, p–value=0.002<α=0.05) (Fig. 13).

During the analysis of three submesostructures profiles regarding their average ranking position and fluctuations for every PKD division referring to the classes of enterprise sizes, I presented in my research that they are not similar. In 15 per 24 cases, the average ranking position for the same PKD divisions of MSE submesostructure was higher than in the SSE (62.5%). For the relation of large–medium enterprises, it concerned 13/24 cases, i.e. 54.2%.

The aforementioned notices can be described additionally by correlation measure – it equalled as follows for the pairs for medium rank position: small–medium enterprises, r=0.82 and medium–large– r=0.68 (p–value=0.00…<α=0.05). For the pair of small–large, the correlation was average and statistically significant (r=0.46, p–value=0.024<α=0.05).

The submesostructures are definitely different in ranking fluctuations – for small enterprises it equals 3.36, for medium 2.32, and for large 1.44. Moreover in 18 per 24 cases, ranking fluctuations of the same PKD divisions of medium enterprises submesostructure was lower than in small ones (75.0%), and in large comparing to medium ones in 17 per 24 (70.8%) (Fig. 14).
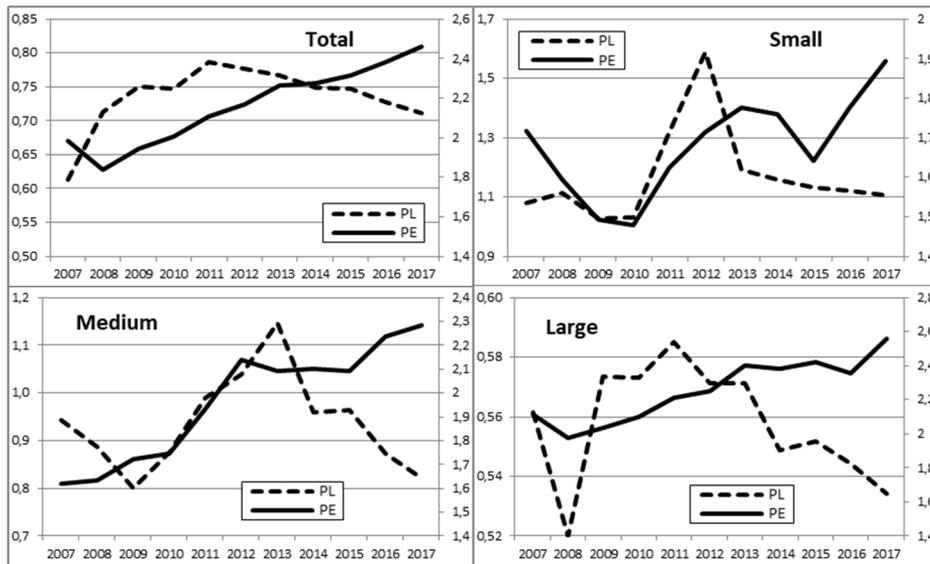
Figure 13. Components of competitiveness measure (CM) of manufacturing mesostructured in 2007–2017 in regard to the classes of enterprise sizes
Notes: PE – Productivity of cost (according to export), PL – Productivity of labour.
Source: same as Figure 6.
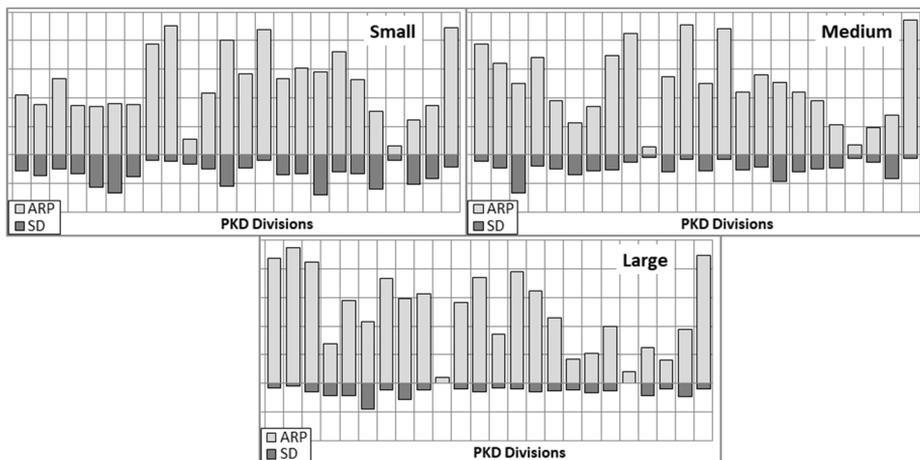
Figure 14. Profiles of PKD Divisions of manufacturing mesostructure in regard to the average rank position (ARP) and its variation (SD) concerning the competitiveness measure (CM) in 2007–2017
Source: same as Figure 6.

My application of normative patterns for PKD divisions, differentiating simultaneously in regard to the rank position and its variation (in regard to CM measure), enabled me to compare the compliance of profiles of analysed submesostructures. This compliance occurred for

the pairs of small–medium in case of 10 PKD divisions (41.7%), medium–large in 15 divisions (62.5%), small–large in 8 cases (33.3%). Therefore the highest similarity exists between the mesostructures of medium– and large–sized enterprises (Fig. 15, left panel).

PKD Division	Small	Medium	Large
10	I	III	III
11	II	III	III
12	III	IV	III
13	II	III	I
14	II	I	III
15	II	II	II
16	II	I	III
17	III	III	III
18	III	III	III
19	I	I	I
20	I	III	III
21	IV	III	III
22	III	III	I
23	III	III	III
24	IV	I	III
25	IV	III	I
26	IV	IV	I
27	III	I	I
28	IV	I	I
29	II	I	I
30	I	I	I
31	II	I	I
32	II	II	I
33	III	III	III

III				IV	
Small	29,2%		20,8%	Small	
Medium	45,8%		8,3%	Medium	
Large	50,0%		0,0%	Large	
Small	16,7%		33,3%	Small	
Medium	37,5%		8,3%	Medium	
Large	45,8%		4,2%	Large	
I				II	

Figure 15. Profiles of PKD Divisions of manufacturing mesostructure in regard to the normative patterns concerning the competitiveness measurement (CM) in 2007–2017
Source: same as Figure 6.

Moreover, the structure of PKD divisions according to normative patterns (the number of PKD divisions included into one particular model) indicates also higher similarity of submesostructure of medium and large enterprises (Fig. 15, right panel).

CONCLUSION

The objective of this article and own research was the assessment of competitiveness and identification of manufacturing mesostructure characteristics of Polish economy. The analysis and assessment included density of mesostructure objects, position of focal point and its way. The classification of objects was also conducted. It was performed with the use of defined normative patterns. During the survey, the test of similarity level of manufacturing mesostructure profiles was conducted with the application of average rank position, variability of this position and normative patterns.

The results of the research resulted in numerous detailed findings presented in the article in the part devoted to the discussion of the obtained research results, including a positive verification of the research hypotheses. These conclusions can be summarised as follows:

1. The mesostructure change phases from the point of view of changes intensity of competitiveness measurement (CM) are years 1990–1999, 2000–2006 and 2007–2017. The most intensive one was phase 2 (before and at the beginning of entering into the EU);
2. There is a very strong and statistically significant correlation of time series of measures CM and DF. The increase in competitiveness (CM) was related to the increase in mesostructure objects diffusion (DF) – the objects were more and more various: more in the sense of cost export productivity than labour productivity;
3. Variation of ranking positions of mesostructure objects decreased by almost half – mesostructure absorbed the features of permanency. The shape of regression curve divides the way of mesostructure focal point into the fragments in the way being close to phases distinguished in regard to the intensity of competitiveness changes (CM);
4. In nearly 2/3 out of 28 tested annual periods, the pace of PE factor changes was higher than of factor PL and the growth of mesostructure competitiveness in 3/4 is on the side of export factor (PE) and only in 1/4 on the side of labour factor (PL) which creates the negative assessment;
5. PE is permanent and progressive factor of competitiveness for the submesostructure of MSE and LSE. From the half of third phase of transitions, the influence of PL factor has become weaker;
6. In over a half of cases (62,5%), the average ranking position of the same PKD division (objects) of submesostructure of MSE was higher than of SSE. For the relation of large–medium enterprises, it took place in 54.2% of cases. Concerning the variation of ranking position, the same regularity occur;
7. Concerning the normative patterns of changes, the similarity between submesostructure of medium and large enterprises is relatively weak (62.5%). The level of similarity is of 1/3 lower for the submesostructure of small and medium–size enterprises.

Summarizing the results of the assessment of competitiveness, its factors and their relationships presented above, the following key properties of manufacturing mesostructure of the Polish economy can be pointed out:

1. Development of manufacturing mesostructure is characterised by phase, objects diffusion and increasing permanency of their rank positions,
2. Factor of manufacturing mesostructure competitiveness growth is based on export rather than labour productivity,
3. Profiles of manufacturing submesostructures according to enterprise size classes are different.

The research whose results are presented in the article constitute an important contribution to the development of knowledge of the essence, course and factors shaping the competitiveness at the mesostructural level. This level of this research, although desirable, is rarely present due to the necessary broad object and subject scope. Own research was based on unique data concerning the whole group of manufacturing enterprises functioning in Poland (over 14,000).

For each research study, it is necessary to indicate the limitations in terms of universality of the conclusions drawn from it. In this respect, it should be noted that an undisputed restriction is the concentration of competitiveness research on manufacturing mesostructure on one transforming Central European country, i.e. Poland. However, it is a country which is at the forefront of countries characterised by high, positive effects of

transformation. Its great potential, with its structure similar to that of the leading transformation countries such as the Czech Republic, Estonia and Slovakia, may be a distinguishing feature of this group of countries in terms of the competitiveness of manufacturing mesostructure. Of course, if there are conditions to obtain comparable data for other countries, it will be possible to conduct a detailed comparative analysis.

On the other hand, there are no limitations as to the universality of applications at the level of the Polish economy. This is due to the increased uniqueness of the surveys carried out – they cover all entities covered by official statistics and classified as manufacturing mesostructure (therefore they are not surveys carried out on a research sample).

This is also a feature of the high added value of the research carried out – it is the first of its kind in Poland. The construction of an analytical model using a combination of factors and sub–measures, which provides a synthetic measure of competitiveness, should be raised as another important added value. In this context, the factor analysis of the competitiveness and variability of the mesostructure and its profiling by size classes of enterprises have a particular value. This is the first such model to be used in the assessment of the competitiveness at the mesoeconomic level of the countries undergoing transformation in Central Europe.

The value of research is also enhanced by a broader perspective on understanding and assessing competitiveness. The research was presented in a broader context of assessment of macroeconomic competitiveness of the Polish economy and the extent to which one of the objectives of its transformation has been achieved, which broadens the context of understanding this complex economic category.

My research and the extended scope of information, resulting from the used data base of full group of enterprises, open the way towards further and broader research exploration of objects and their groups as well as other structures, i.e. PKD sections, or PKD classes. Each group or single object can undergo the exploratory factor analysis of competitiveness, which can constitute the subject of further research.

Thanks to the current access to data, this direction of further research is appropriate for the mesostructure of the Polish economy. If the conditions for obtaining comparable data for other countries are met, it will be possible to conduct a detailed comparative analysis first of all for Central European countries – CEB and DEE. As a further step, it is possible to carry out a comparative analysis of the transforming countries (new EU countries) and the leading EU countries (EU–15) in the field of mesostructure characteristics and factors shaping its competitiveness.

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