

## THE INFLUENCE OF INVESTMENT DECISIONS ON CHANGES IN EMPLOYMENT IN PRODUCTION ENTERPRISES IN POLAND\*

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**Abstract:** The article attempts to find a relationship between investment decisions taken in manufacturing companies and changes in the level of employment, and to determine the correlation between the intensity of changes in analyzed relationships. The aim of the article is to analyze the relationship between the value and intensity (rate) of changes in investment decisions taken by small, medium and large production companies, and their impact on the change in employment in the surveyed size classes of enterprises in Poland in 1995-2018. In order to indicate the existing correlation, the value of investment outlays and their impact on employment change for the current period was compared. Linear regression models were used to assess the degree of interdependence, and the results of the analysis indicated that investment decisions made by manufacturing companies are not a determinant of changes taking place in the level of their employment. In addition, the results of correlations showed in manufacturing enterprises that there was a negative correlation between the measures analyzed excluding medium units. The research showed that not only investment growth and its impact on employment are important, but also its appropriate level (rate).

**Keywords:** investment, employment, manufacturing, enterprises.

### 1. Introduction

Investment decisions taken in enterprises constitute all kinds of economic expenditures for reproduction of all types of tangible and intangible economic resources (human, material and monetary). The functioning of the enterprise, considered in particular in the long-term perspective, is generally associated with the indispensability of making investment decisions. They are not only the basis for development, but above all, by reconstruction decisions, they enable maintaining the current position of the company or increasing its potential.

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\* Publication financed by funds granted to the Management Faculty of Cracow University of Economics under the scheme for subsidising university research potential.

The importance of investment decisions in shaping the directions and scale of further business operations makes the issue of investment decisions crucial for the company's operations (Zygmunt, 2013). They condition further development of all economic entities and their business activities that make up the whole of the management processes in individual countries. Investment decisions are also called spending of funds for the purchase of certain economic objects, securities or intangible assets in the form of rights enabling the execution of economic processes, recovery of capital and obtaining additional benefits in the future in the form of an increase in own potential (Walica, 1998; Towarnicka, 1996). The interdependence of investments and technical progress is reflected in the methods presented in the literature on measuring the economic effects of investments, in the form of economic relations such as: investing in fixed assets growth, investment in employment growth or technical utilities. The issue of investment decisions is devoted to a number of considerations, both theoretical and empirical. It should be emphasized that the multifaceted nature of issues related to the aforementioned decisions determines the relatively large diversity of issues addressed in this area. They include identification of the relationship between investment and financial decisions of the enterprise (Modigliani, and Miller, 1958) or the relationship between investment decisions and the choice of specific sources of investment financing (see also: Myers, and Majluf, 1984; Harris, and Raviv, 1991; Rajan, and Zingales, 1995; Shyam-Sunder, and Myers, 1999; Gajdka, 2002).

Creating appropriate conditions conducive to investing in the economy seems to be not only the main factor of growth, but also a condition for positive changes on the labor market. The basic condition for improving the situation on the labor market is to accelerate economic growth, especially through the revival of investment processes. From Keynesian growth models, the employment growth rate is directly proportional to the investment rate (savings). Assuming a continuous increase in labor productivity, which is characteristic of the Polish economy, the increase in employment requires a correspondingly high growth rate of investment. It should be emphasized that from the point of view of creating new jobs and the demand-side effects of investment, not only is the high level of investment important, but also the increase in investment size compared to the previous period (Kwiatkowski, and Tokarski, 2004).

The main aim of this article is to identify and analyze investment decisions and their intensity and their impact on employment change and the pace of growth of manufacturing companies, grouped by their size classes in the years 1995-2018, a period covering the structural changes in Poland after the change of regime, and the period covering Poland's accession to the European Union and the global crisis. On the basis of the available data, the relationship between investment decisions of the production area enterprises and the changes in the number of employees according to the distinguished size classes of enterprises (small, medium, large) in Poland and the tendency, relation and dependence of the observed changes were analyzed.

## 2. Objectives and directions of investment activity

Investments are recognized as the subject of economic activity and are defined as investment activities based on certain management decisions and aimed at increasing the potential of enterprises. It is oriented on the development of each economic entity and decides not only about the future development of business entities, but also their current operation, or their activities. Investment decisions are of considerable importance in the functioning of the enterprise and its subsequent development and are a key factor determining the development of the company and shaping its long-term effectiveness (Finance, 1999, p. 361). They can be treated as the basis for the implementation of the overriding objective of the company's operation expressed in maximizing its value measured by various measures. It can be stated, therefore, that investment decisions significantly influence the future direction of the company's development. In this context, Halina Towarnicka defines these decisions as "strategic economic decisions" (Towarnicka, 2003).

Taking into account the definitions of investment and the ways of understanding the investment (see also: Blanket, Waślicki, 2001; Felis, 2005; Kasprzak-Czelej, 2013; Smolen, Urban, 2010; Rudkowski, 2006; Henzel, 2005; Michalak, 2007), their essence, presented in the literature, is expressed in investing, i.e. incurring investment outlays in order to obtain best economic effects of investments in the current or deferred period. The significance of time and its impact on investment effects comes from such understood essence of investments.

Investment decisions as a subject of enterprise development activity, the national economy and its particular areas or operation are distinguished by higher risk and uncertainty occurring at every stage of investment implementation regarding expenditures, expected outcomes, payback period and the need to accumulate significant cash and more.

The purpose of the investment and the expenditure incurred for their enactment is to obtain the planned effects. These include substantive effects, structural, micro- and macroeconomic quantitative, qualitative and social effects. The effects that create the material and immaterial and legal conditions of further development by increasing the production potential and increasing the degree of utilization and efficiency of managing the available resources are of particular importance.

The conditions and factors shaping changes in the size and structure of investment outlays and their economic effects are strongly correlated with the conditions and factors for the development of (economic) enterprises. This, in turn, is characterized by the integrity of growth links (quantitative changes) with structural changes in the effects obtained. Increasing or decreasing the dynamics of investment growth causes the increase or decrease of dynamics (intensity) of structural transformations and their direction. The interrelations between economic growth and structural changes are characterized by a strong positive feedback. Such changes do not cause small economic growth. With a small economic growth,

the tendency to petrify structures is strengthening. Similar interdependencies occur between the size of investment outlays and changes in the size and structure of economic effects. The economic effects of investments, which are significant for the future development of enterprises, are obtained in the appropriate from the point of view of development goals, the size and structure of investment outlays. What is important is not only their size and dynamics, but also the directions of investment. When they are subordinated to rationally defined goals of economic development, investments ensure their achievement. Thus, they depend to a large extent on the reliability, versatility and accuracy of analyzes and assessments of the purposefulness and feasibility of investments made in the preliminary phase of their implementation, taking into account their type, scale, location and investor (Xin, Ma, and Gao, 2009; Pakdeenurit, Suthikarnnarunai, Nanthi, Rattanawong, Wanchai, 2014).

The main goal of the article is to analyze the relation of investment decisions and their impact on the employment in production enterprises in Poland, grouped according to their size classes. In making this analysis one should, of course, remember that the situation on the labor market depends on the majority of phenomena and processes taking place in the economy, as indicated earlier in accordance with the subject literature and empirical research (Tokarski, Roszkowska, and Gajewski, 2005; Wiśniewski, and Salejko-Szymczak, 2004; Gawrycka, 2002). Herein, the investment process is closely correlated with the number of jobs generated. Investment decisions put into place especially by enterprises allow the creation of new jobs, and their constant level allows one to maintain one's existing job. When making this analysis, it should be borne in mind that not all investments generate new jobs or contribute to the maintenance of existing jobs, as they can only increase the level of labor productivity. The impact of investment on labor productivity can be complex, especially in a low-growth economy. They may entail difficulties in maintaining existing jobs, which results from the need to adjust the quality and level of employees' qualifications to the positions of work offered by enterprises (Bremond, Couet, Salort, 2005). On the other hand, increasing labor productivity improves the efficiency of operations, which makes enterprises more competitive, and investments that increase competitiveness may be conducive to increasing employment levels (Pakdeenurit, Suthikarnnarunai, Nanthi, Rattanawong, Wanchai, 2014). Critical analysis of the subject literature allows us to observe that despite the discrepancies in defining the scope of factual investment decisions, there is no doubt that there is consistency regarding indicating investments in fixed assets as the main direction of making investment decisions (Zygmunt, 2013; Idris, Rejab, & Ahmad, 2008).

The subject of the analysis was the analysis of changes in the value of incurred investment outlays and their impact on the rate and changes in employment in a group of production enterprises employing more than 9 people, and its results were presented as broken down into four groups: total production enterprises (over 9 persons), manufacturing enterprises small (employing from 10-49 people), medium production (50-249) and large production (over 249 people). Micro-enterprises (0-9) were not included in the research due to the high share of self-

employed entities, i.e. enterprises that do not conduct investment activities aimed at improving their competitiveness, increase their productivity and, as a result, increase employment. The enterprises included in this research are, therefore, entities subject to obligatory reporting by the Central Statistical Office (F-01 and F-02). Data regarding their activities for the years 1995-2018 were obtained from the GUS and the PONT INFO databases.

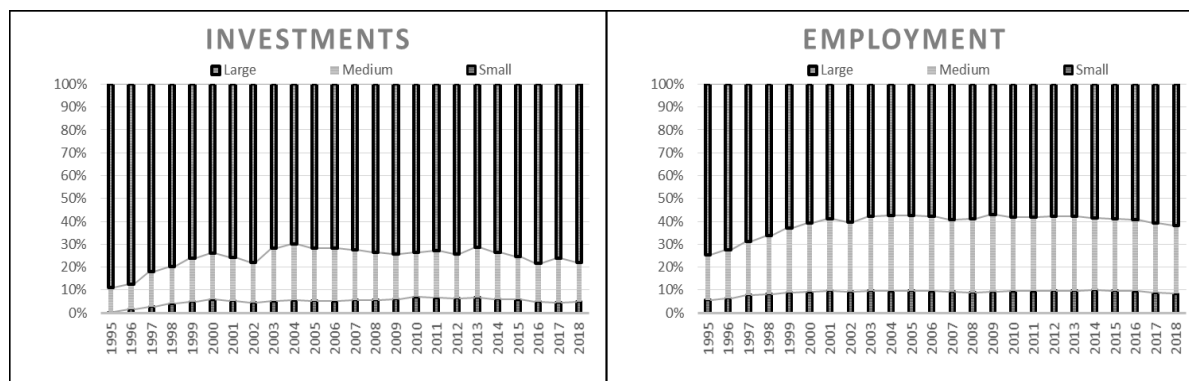
The analysis of data variability was carried out using comparative methods of variability of the analyzed measures and taking into account the comparative aspect of the rate of change. The comparative analysis was enriched with statistical linear regression analysis and correlation analysis.

### **3. Analysis of changes in the size of investment and employment**

In the literature on the subject, research papers are available indicating the existence of dependencies between investment decisions borne by enterprises and change in employment (see also: Szymczak, 2017; Gawrycka, and Szymczak, 2015; Kwiatkowski, and Tokarski, 2004; Kolegowicz, 2017; Zimmermann, 2009), and the conclusions presented in them prove the existence of relations between the variables in question. A certain research gap is the lack of a detailed analysis of the dependencies of the analyzed variables in various industries and answers to questions or proven relationships occur in all size classes (Hunjra, 2011) and types of activity, and whether the intensity of decisions affects the intensity of changes and their intensity. In connection with the above, the article attempts to analyze in detail the relationships between the surveyed amounts (investments and employment) in the group of production enterprises due to their large share in the assets of all enterprises in Poland and the specificity of the conducted activity in which the change of technology forces investments in fixed assets in the form of machinery and equipment, which may result in employment reduction. Production enterprises are characterized by a high degree of technical equipment and high share in total investment and employment. The research in question covered the variability of two measures and their interdependencies and the relationship between the intensity of changes in investments and changes in employment.

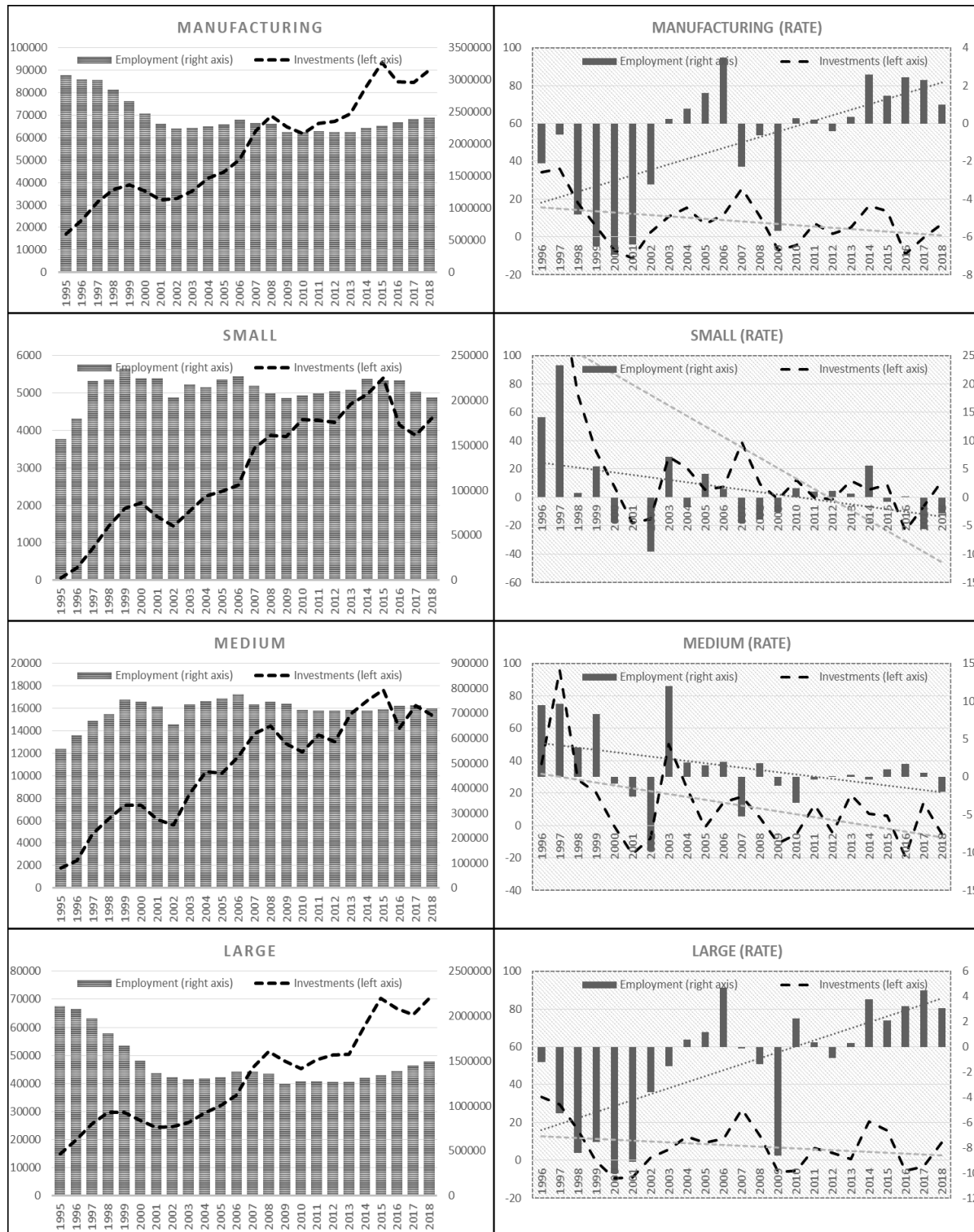
As the first step of the analysis, I present an analysis of the investment and employment structure of manufacturing enterprises by their size classes. Assessment in this form (Figure 1) indicates their significant differentiation and demonstrates the dominance of large enterprises (89% in 1995) throughout the analysis period, with an outlined tendency to reduce their share. At the same time, the importance of small and medium-sized enterprises is seen to increase. Comparative analysis of the structure of investment outlays and employment is similar to their variability, but the greater importance of small and medium enterprises is evident in employment rather than in investment outlays. The intense dominance of large enterprises was

observed in both analyzed measures with simultaneous high volatility of participation ratios, which indicates the necessity to analyze in detail the changes of these measures in particular groups of enterprises.



**Figure 1.** Structure of investment of enterprises in Poland in 1995-2018, by sizes. Source: own elaboration on the basis of figures: *System Gospodarka*, Pont Info Warszawa, <http://www.pontinfo.com.pl>; *Wyniki finansowe przedsiębiorstw niefinansowych*, GUS Warszawa, <http://stat.gov.pl/publikacje>; *Podmioty gospodarki narodowej*, GUS Warszawa, <http://stat.gov.pl/publikacje>.

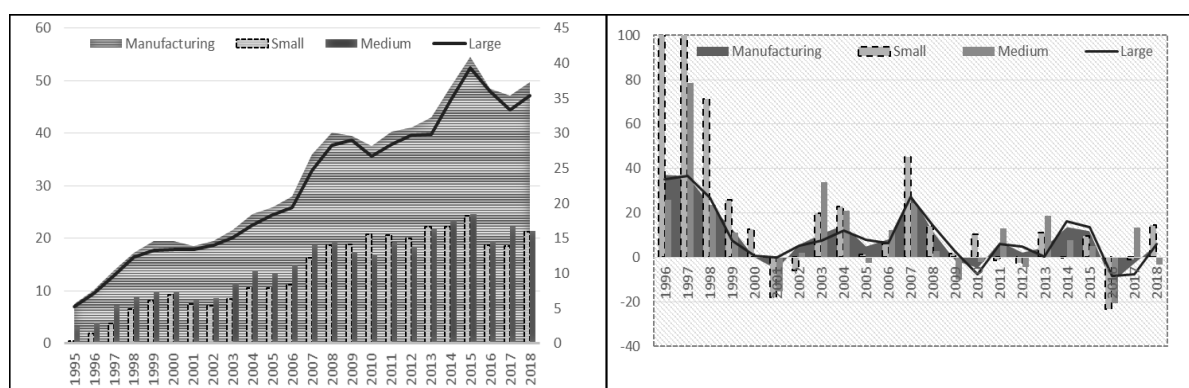
The analysis of the course of capital expenditures indicates a strong upward trend in production enterprises in Poland from 1995 with clearly distinguished three periods of deceleration (2001-2002, 2010-2012, 2016-2017) that were caused by external conditions causing a decrease in investment activity. The volume of employment in manufacturing enterprises in Poland was characterized by its strong reduction until 2002, a subsequent stabilization and a stable growth since 2013, whose course was determined by the volatility of employment in large enterprises. Different types of changes were observed in small and medium production units. In the analyzed period, the average annual rate of change in investment of manufacturing enterprises was at the level of 7.6%, with a simultaneous negative average annual employment rate (-0.68%) and this volatility was determined strongly by the decisions of large manufacturing enterprises. In small and medium-sized enterprises, the average annual rate of change in investment and employment was characterized by positive values (small: 20.35% and 1.12%, medium 9.84% and 1.10%). The analysis of the rate of change in investment indicates its clear downward trend both on the overall level and in all size classes. The change in the rate of employment at the total level and in large enterprises was characterized by an upward trend. Variable waveforms and their pace show the need to conduct a detailed analysis of the relationship between investment decisions of manufacturing enterprises in Poland and their impact on the volume of employment (Figure 2).



**Figure 2.** Investment volume (left panel, in PLN billion) and rate of change (right panel, previous year = 100, in%) of production enterprises in Poland in 1995-2018, by sizes. Source: the same as Fig. 1

#### 4. Decision-making activity and the effect of the variability of the number of employees

In the light of the observed diversity of the analyzed measures, it is advisable to relativize the course of two analyzed measures in the form of a single measure indicating the direction of their changes in investment expenditures borne by enterprises per one employee. This analysis reveals that the largest capital expenditures per one employee were borne by large production enterprises. In small and medium-sized manufacturing enterprises, both values and the course of changes were on similar levels throughout the period. The analysis of the course of change pace indicates a weakening upward trend in the whole period, with clearly distinguished three periods of negative pace values (2000-2001, 2009-2010, 2016-2017). It is worth noting that in a few years the value of incurred investment outlays per one employee in small enterprises was at a higher level than in medium-sized enterprises. Observations of tempo changes unambiguously indicate the cyclical nature of behaviors, while their distinct lengths are shortened.



**Figure 3.** The value of investments (left panel, in PLN billion) and the rate of change (right panel, previous year = 100, in %) per one employed in enterprises in Poland in 1995-2018, by sizes. Source: the same as Fig. 1.

In order to search for the impact of investment decisions on changes in employment in total enterprises in Poland in 1995-2018, linear regression analysis was used (Table 2) and the relationship between investment outlays and employment size as a result of investment decisions and the analysis of the impact of investment intensity on the dynamics of change in the rate of employment was uncovered. For manufacturing enterprises in general, the coefficient of determination was at the level of  $R^2 = 0.35$ , indicating a relatively low adjustment of the regression equation and the inverse relation of changes. Made evident was the low level of matching related to the impact of the intensity of changes in investment decisions on the intensity of employment changes. Herein, a clear relationship between the analyzed measures was not noticeable. The value of Pearson's correlation coefficient ( $r_{xy} = 0.59$  and  $0.19$ ) calculated on their basis also indicates a relatively low correlation between the variables studied.



The  $R^2$  determination factor in small and large enterprises indicates a very low level of matching and does not allow to formulate a statement that there is a relationship between the change in investment outlays and the change in employment in small and large production enterprises, and their increases do not directly intensify changes in the employment.

Linear regression analysis in medium-sized enterprises indicates a relatively moderate adjustment of the regression equation, presenting both direct changes and the rate of change in employment as a function of the rate of changes in the investment of the studied enterprise class. The value of the correlation coefficient ( $r_{xy} = 0.56$  and  $0.71$ ) calculated on its basis, proves a high correlation between the analyzed variables.

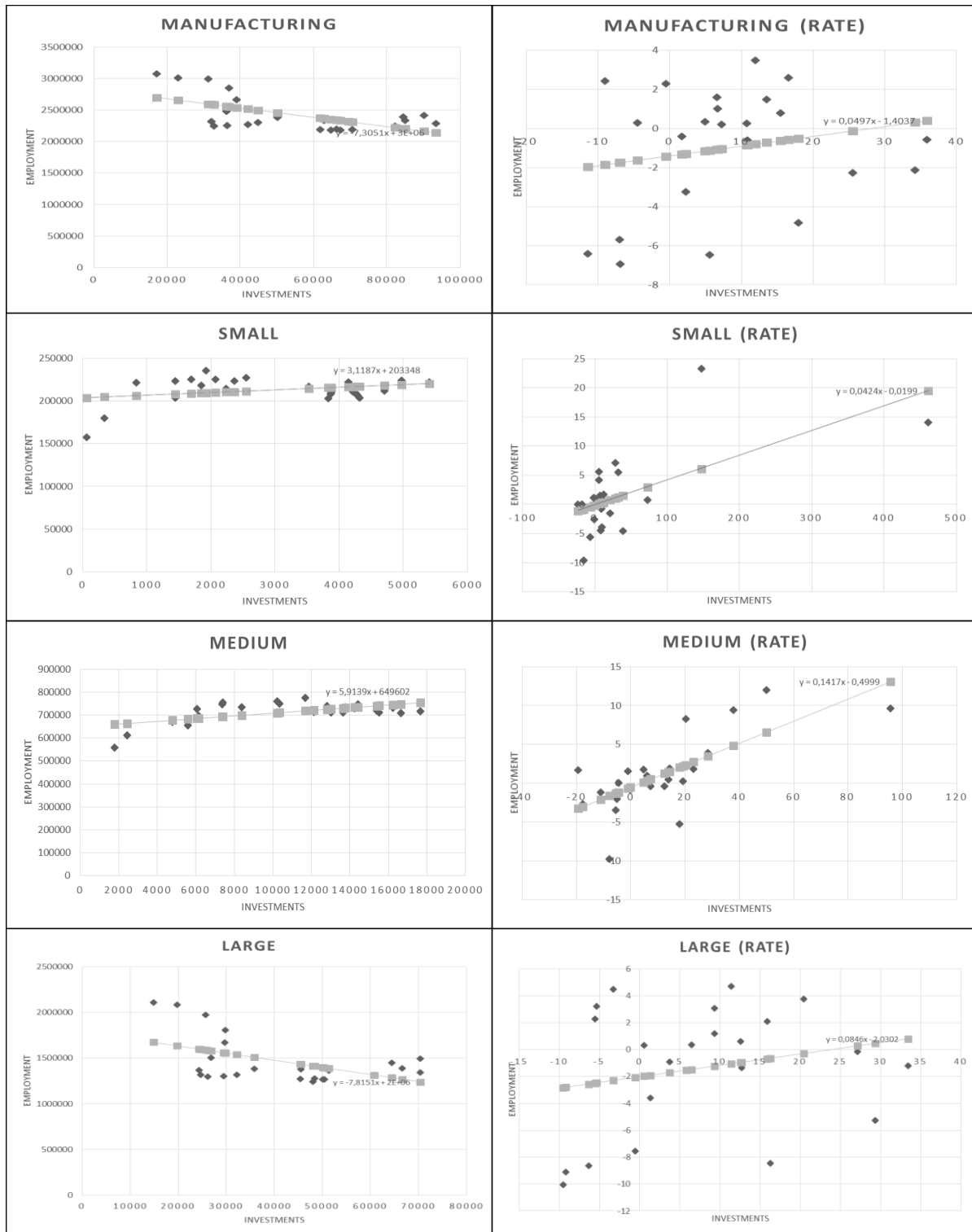
**Table 2.**

*Correlation coefficients and determination of the dependence of the employment growth rate and the growth rate of investment expenditures of manufacturing enterprises in Poland in 1995-2016, by sizes*

	Value		Rate	
	$R^2$	$r_{xy}$	$R^2$	$r_{xy}$
<b>Manufacturing</b>	0,34817	0,5900	0,03897	0,19742
<i>Small</i>	0,08527	0,29202	0,38049	0,61684
<i>Medium</i>	0,32269	0,56806	0,50783	0,71262
<i>Large</i>	0,25135	0,50135	0,04945	0,22237

Source: the same as Fig. 1.

The linear regression curves for production enterprises (Figure 6) show that an increase in investment outlays by PLN 1 million will result in a decrease in employment by 7.3 persons, and, at the same time, a change in the investment rate by 1% results in a change of 0.05% in employment, which is confirmed by low dependence between the analyzed variables and the impact of volatility of investment outlays on the employment in the examined group of production enterprises. Analogous runs were observed in large manufacturing companies. In small and medium-sized enterprises, an increase in investment outlays by 1 million will result in an increase in employment by respectively: 3.11 and 5.9 persons, indicating the reverse relation than at the overall level and in large entities. In medium-sized manufacturing enterprises, the relationship between the intensity of changes in investment decisions and their impact on the rate of change in employment is also stronger.



**Figure 4.** The relationship between investment and employment (left panel), and the rate of their changes (right panel) of enterprises in Poland in 1999-2018, by sizes. Source: the same as Fig. 1.

## 5. Conclusions

The comparative analysis of the value and pace of changes in investment outlays, as well as their statistical analysis, indicates that investment decisions made by manufacturing companies over the past 23 years are not a determinant of changes in the level of employment. On the basis of the conducted research, it was found that the increase in investment outlays of production enterprises in general, as well as large production capacities in particular, does not result in employment growth - only in its reduction. This dependence may result from a high level of workstation automation in production enterprises and, as a result, substitution of human work by machine work. The situation on the labor market may have an impact on this situation, as well as the drive to achieve higher levels of productivity at workplaces. An important observation is the fact that in the entire analysis period, there is a negative correlation between the value of investment decisions made and the size of employment and their low level of dependence in production enterprises in Poland. A correlation was only observed between the studied relationships and the matching values of variables indicated a significant correlation between variables only in medium-sized production enterprises.

Summing up, it can be concluded that stimulating investment in production does not seem to be an important factor in job creation, with the exception of medium-sized enterprises. This underlines the fact that investment decisions in not every enterprise class stimulate employment in the same way. In addition, it is worth noting that not only is the increase of investment and its impact on employment important, but its appropriate level (rate) is far-reaching. The conducted analysis showed the diversity of dependencies of changes in investment outlays depending on the size of the surveyed enterprises. It was noticed that the impact of investments on the change of employment in the size classes of enterprises is different, but also that in small and large production enterprises, this correlation was the weakest and did not allow an indication of dependence.

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