

The importance of labour and capital inputs in the evolution of the food industry in Poland

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Abstract: The issue of modernisation of the job market for international needs in every country, even those well developed economically, arouses wide interest not only among practitioners acting in the broadly understood world economy, but also among analysts and researchers. Human capital is one of the most important resources of economies, societies and businesses. The main aim of this article is to show that the modern job market is closely connected with human capital, it evaluates with human capital and strengthens financial results, which is shown in the article on the example of food industry businesses in Poland in the post-accession period. The research process is supported by survey conducted in the period from the beginning of March to the end of May 2016 on a group of 438 businesses. The second stage of studies was conducted in 2018 and concerned research into human capital in the period 2011-2016. On the basis of certain indicators, an evaluation was made of the effectiveness of the human capital possessed, through effective of management. The results of the study confirmed that, in the research period, there was an increase in the role of human capital in businesses dealing with the manufacture of food products and beverages. This capital has enabled increases in work quality and an increasing ability to generate profit. In addition, in the businesses studied, there were different levels of use of human resources through those years, which demonstrates that the production capital of food industry enterprises was not always fully used.

Keywords: capital, labour, evolution, food industry

JEL: E24, J24

Introduction

The modern job market, approaching the end of the political and economic transformations in Poland, faced a special kind of challenge. The economy was exposed to new demands, especially in the period when it became a symbol of economic success in Europe. This kind of opinion, supported by statistical data showing twice the amount of GDP per capita than at the beginning of the transformation, underlines the developmental possibilities of a national economy supported by the resources possessed. The issue of the modern job market is closely connected with the quality of human capital, which is the one of the most important resources in every economy. Human capital most often determines the final level of functioning of the economy in total. Human capital is also very useful to gain a competitive advantage,

so it affects companies' market position. It is treated as a resource in companies because it combines capital, labour and entrepreneurship as well, as it is the knowledge, efficiency and skills of a human being which determine the growth in productivity. As A. Poczowski underlines '... the new economy emerging, whose main determinants are globalisation, computerisation and knowledge, prompts new developments that are challenges in the field of human resources management. The main among them include changes in the content and conditions of work, building involvement around organisational learning, changes in traditional managerial roles, appreciation of cultural diversity, maintaining a balance between work and personal life, and personal risk" [Poczowski 2003, p. 9]. Human capital focuses on primary values such as the knowledge, skills and qualifications of employees, the relations between them and their potential for development. Human beings develop their ability to work, which is a source of their future income, and skilfully adapt to changes in environment, try to solve the problems they meet efficiently, and thus obtain satisfaction, while businesses generate income proportional to the quality of work performed. On the other hand, a market economy forces enterprises to search for new sources of competitive advantage, which can include the strategic use of intellectual capital [Firlej 2008, pp. 85-89]. Intellectual capital is a vital factor that distinguishes enterprises in the current economy, where knowledge, its related elements and their total use influence the results achieved by a company [Firlej, Palimąka, Mierzejewski 2016, pp. 190-209]. Owing to the proper management of intellectual capital, it may be possible to significantly influence a company's success in implementing the adopted strategies.

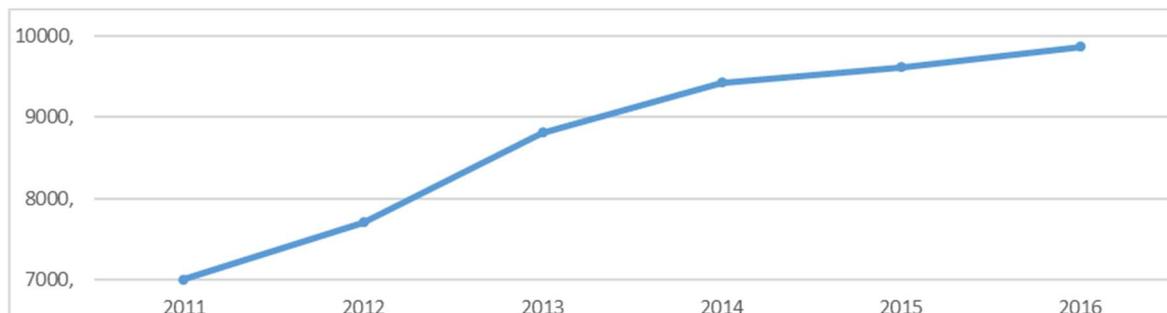
The role of human capital in the development of the food industry – theoretical aspects

The food industry plays a number of roles in a market economy, among the most important should be listed: production, responsible for producing and processing products; a social function, creating jobs, the development of production techniques and improving living conditions; a spatial function that facilitates the development of cities, accelerates urbanisation processes and influences all kinds of transformations in the environment; an economic function, that is de facto the most important for entrepreneurs and fulfilled by the production of various goods [Firlej 2017, p. 13]. The social function of industry takes the main role in human capital development and this function is reflected not only in the development of production technologies but also contributes to the improvement of living standards and is responsible for providing decent jobs. Especially in the food industry, this function is performed and strengthened by innovative business activities that are often connected with people's qualifications and the proper organisation of work. Carrying out this function also means

creating jobs for local people. The second function in the development of human capital is the production function, which determines the production capacity of a business, and so the theoretical production volume possible within a defined time with a fixed amount and structure of investments. A production method is usually defined by the general structure of the inputs, which includes human resources.

In the period of transformation, businesses functioning not only in the food industry but in the economy as a whole, invested a lot in development and strengthening the human capital they possessed, and it became a basis for the economic upturn in Poland (fig. 1). Investment outlays on the manufacture of food products and beverages in Poland increased year on year (between 2011 and 2016 by 40.88%).

Fig. 1. Investment outlays in the manufacture of food products and beverages in Poland in the years 2011-2016 (at constant 2011 prices)



Source: own studies based on the Central Statistical Office (GUS).

J. Czapiński emphasises that ‘... human capital involves individual competitiveness based on intellectual, motivational and symbolic resources (e.g. prestige) and the indexes of these resources may include: education, job experience, migration and – less frequently taken into account – skills [Hause 1972, pp. 108-138], physical health [McDonald, Roberts 2002, pp. 271-276; Mushkin 1962, pp. 129-157] and, completely ignored, mental well-being [Luthans, Luthans, Luthans 2004, pp. 45-50]. In the literature concerning this subject human capital was also defined as a resource useful in achieving the economic aims of an organisation, conditioning economic success, which in the global economy determines the market power of enterprises [Czapiński 2008, pp. 5-7]. In the Polish literature, the definition by Domański is most often quoted, that human capital is a resource of knowledge, skills, health, strength and a person’s vital energy [Domański 1993, pp. 35]. B. Wawrzykowski sees human capital as a resource composed of the skills, knowledge, health and energy of an employee determining their abilities to learn, work and create new values, as well as their ability to adapt to changes and, at the same time, to anticipate and taking advantage of the opportunities that appear. Thus, it is a set of inherent qualities of a given employee that only they possess, it is a personal

resource that may be used to fulfil their needs, or implement company's aims [Wyrzykowska 2008, p. 163]. The development of human capital directly influences the growth of modern technologies through research and inventions, as well as being a proper response to changes in the market, with the absorption of innovations which continually appear. This evolution most often takes place due to the employees themselves, who try to perform many transformations, being the de facto creators of innovations and the initiators of modernisation in their enterprises. As R. Urban [Urban 2014, pp. 2-6] emphasises, one of the main opportunities for the development of the food industry is the development of qualitative and innovative advantages. In addition, he notes that the development of human labour and human capital is fast, therefore increasing the productivity and effectiveness of management should be supported by productive capital.

Aim and methodology of the study

For the purposes of this study, in the first stage of the research, food industry enterprises functioning in Poland in the years 2005-2014 were considered as a population, namely those enterprises defined in accordance with the Polish Classification of Businesses Code (PKD 2007) in Section C Industrial processing, Division 10 Manufacture of food products, Division 11 Manufacture of beverages and Division 12 Manufacture of tobacco products. As a random frame, that is a consolidated list of units of the analysed population, the list of enterprises included in the information on national economic entities in the REGON statistical number register determined by the Central Statistical Office (GUS) for 32.12.2015 was adopted.

In order to obtain a representative sample of population units a probabilistic (random) technique of sampling was applied. Within the random technique of sampling, stratified sampling was used. A stratified characteristic in the conducted study was the number of economic entities (food industry enterprises) belonging to the following divisions of Section C Industrial processing, namely Division 10 Manufacture of food products, Division 11 Manufacture of beverages and Division 12 Manufacture of tobacco products (table 1)¹.

¹ Miesięczna informacja o podmiotach gospodarki narodowej w rejestrze REGON,
<http://bip.stat.gov.pl/dzialalnosc-statystyki-publicznej/rejestr-regon/liczba-podmiotow-w-rejestrze-regon-tablice/miesieczna-informacja-o-podmiotach-gospodarki-narodowej-w-rejestrze-regon/>; dostęp 18.01.2015.

Table 1. The number of food industry enterprises in Poland (state as of 31.12.2015)

Section C Industrial processing	Number of entities
Division 10 Manufacture of food products	33 514
Division 11 Manufacture of beverages	1 841
Division 12 Manufacture of tobacco products	81
In total	35 436

Source: own studies based on monthly information on national economic entities in the REGON statistical number register.

During the calculations, the necessary minimum sample size was identified as 267 units (food industry enterprises). Within this number, the necessary number of units in the individual strata was determined:

Division 10 Manufacture of food products – 252 enterprises;

Division 11 Manufacture of beverages – 14 enterprises;

Division 12 Manufacture of tobacco products – 1 enterprise.

The available national and international literature was used in the study, as well as source data from the national and regional Central Statistical Office; the data of the international statistics EUROSTAT and the European Commission, the given trades (The Polish Chamber of Commerce (KIG) Food industry, 'Food industry'), studies and publications of the government administration bodies (the Ministry of Agriculture and Rural Development), publications of economic and business press and trade portals.

As a main research tool, questionnaires were used that concerned the functioning of the food industry and were conducted in the period from the beginning of March to the end of 2016 on a group of 438 enterprises. The coverage of the studies included external and internal factors that limit the functioning of these enterprises in all trades. The structure of the questionnaire provided both broad and detailed data on the studied entities. The statistical part of the questionnaire included the characteristics of the companies during the studied period, their sizes and range of activities, as well as their ownership structure and the organisational and legal forms, and the trade area in which the given entity operated. Most questions gave not only an opportunity to describe the environment of the analysed enterprises, but also effectively specify the degree to which economic processes influence them, and identify challenges for the immediate future. The questions concerned many aspects of the functioning of enterprises, such as financial, legal, organisational, marketing and strategic.

The second stage of the study was conducted in 2018 and concerned research into human capital in the period 2011-2016. In spite of having non-material character, in the process of evaluation of management effectiveness of human capital, financial indexes were also considered, since they are perceived as effective and commonly used instruments for measurement of the trend. Monitoring of ongoing phenomena to a large extent enables us to perceive the changes that took place in a given research area, being at the same time a good source for formulating forecasts. The appropriateness of using indices is based on a complex process of good index construction by rethinking its definition, considering all kinds of variables, the relations occurring between them and analyses showing their suitability in an economic practice. Consequently, the effectiveness of expenditure on human resources was prepared in accordance with the measures of human resources function developed by Fitz-Enza [Fitz-Enz, 2001] and these are used to present the increase of the role of human capital in the food industry enterprises. The study is focused on five indices:

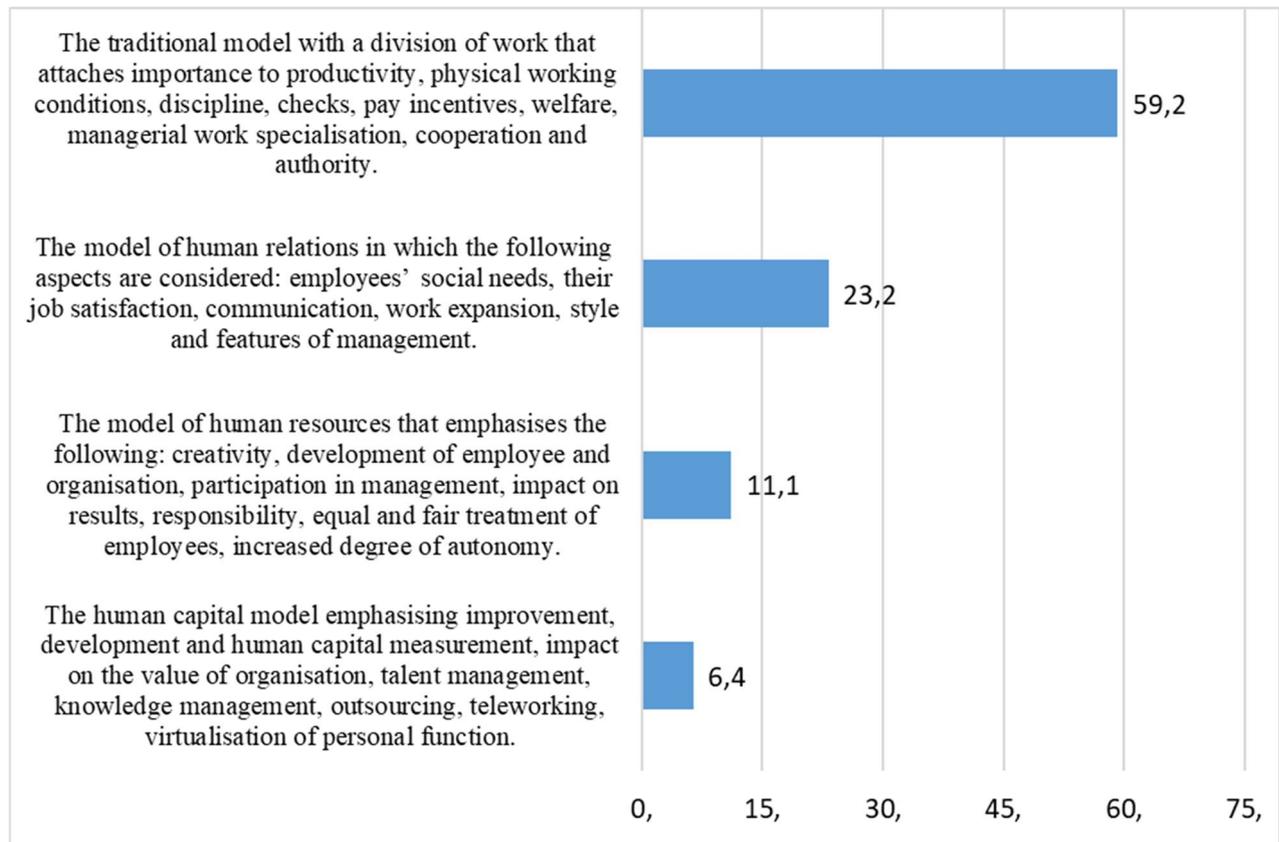
- HCR (*Human Capital Revenue*). This is the main index of human productivity and indicates the amount of time allocated to achieve a specific amount of income. It takes into consideration the total number of working hours invested in generating given revenue.
(1) $HCR = \text{sales revenue} / \text{the number of employees per FTE}$
- Profit per FTE (*Profit per Full Time Equivalent*). This index presents what amount of profit on sales is generated by an individual employee. Sales revenue is corrected by its tax-deductible costs.
(2) $\text{Profit per FTE} = \text{profit on sales} / \text{the number of employees per FTE}$
- Pre tax & interest profit per FTE (*Pre tax & interest profit per Full Time Equivalent*). This is an improved version of Profit per FTE index. It allows us to indicate actual productivity of human capital taking into account profit before deductions.
(3) $\text{Pre tax \& interest profit per FTE} = \text{gross profit} / \text{the number of employees per FTE}$
- The relation between capital input (expressed as the gross value of fixed assets in the manufacture of food products and beverages in Poland (at constant 2011 prices)) to labour input (expressed as the number of people employed in the production of food and drinks).
- Work efficiency dynamics measured by gross value added per employee. This index allows us to identify the amount and economic value added per work unit.

Study results

The questionnaire on food industry enterprises enabled us to assess the level of awareness of a company's mission statement by management and employees. The results of the study indicated an over 82%, very good company's mission statement awareness by management, and a good degree of awareness, of 62%, by employees. The group that was not aware of the company's mission statement amounted to 3.5% in the case of management and 7.1% in the case of employees. Analysing the results concerning the classification of the essential elements of the company's mission statement by employees, it was stated that they were recognised as an essential area of business specialisation at a level of 24.9%, and regarding responsibility, sensitivity to the needs and requirements of stakeholders, and priorities in their realisation at a level of 24.2%. After that, they were indicated in descending order as standards of success and a measure of long-term functioning in the finance, market and marketing area (23%), as key competences, skills and technologies necessary for success (18.4%) and as a vision of organisation seen as a system of hierarchies in the business, culture, tradition and internal folklore (17.7%). The study results showed that, in spite of the different perceptions of the essential elements of a company's mission statement by employees, they appear to have the characteristics of a professional approach to its realisation as a whole, and engenders optimism concerning pro-developmental issues of units.

Considering the role and importance of human capital in the food industry, the respondents were asked to define the model of personal functioning used in their company (fig. 2). It turned out that the most important, and at the same time the most useful element in the practical functioning of a company was the traditional model, in which employees pay most attention to such categories as division of work, work productivity, physical working conditions, discipline, control, pay incentives, welfare, managerial work specialisation, cooperation and authority (59.2%). Second, the model of human relations was indicated, in which employees' social needs were considered as well as their job satisfaction, communication, work expansion, management style and features (23.2%), and third, the model of human resources, that emphasises the following: creativity, development of employee and organisation, participation in management, impact on results, responsibility, equal and fair treatment of employees, increased degree of autonomy, system organisation and personal activities (11.1%).

Fig. 2. Classification of the main models of personal functioning used in food industry enterprises in the years 2005-2014 (in percents)



Source: own studies.

The least popular was the human capital model emphasising improvement, development and human capital measurement, impact on the value of an organisation, talent management, knowledge management, outsourcing, teleworking, virtualisation of personal function, social responsibility of an enterprise, leadership, internationalisation, use of information technologies (6.4%). The study results show that not only technology, but also identical managerial skills are necessary and required in all sectors of economy [Stonehouse, Hamill and others 2001, p. 177]. On the basis of these results, it may be concluded that the entrepreneurs functioning in the food industry apply very pragmatic solutions in their enterprises regarding the realisation of personal functioning, as well as a common sense and considered approach in the implementation of planned activities and development in the achievement of goals set.

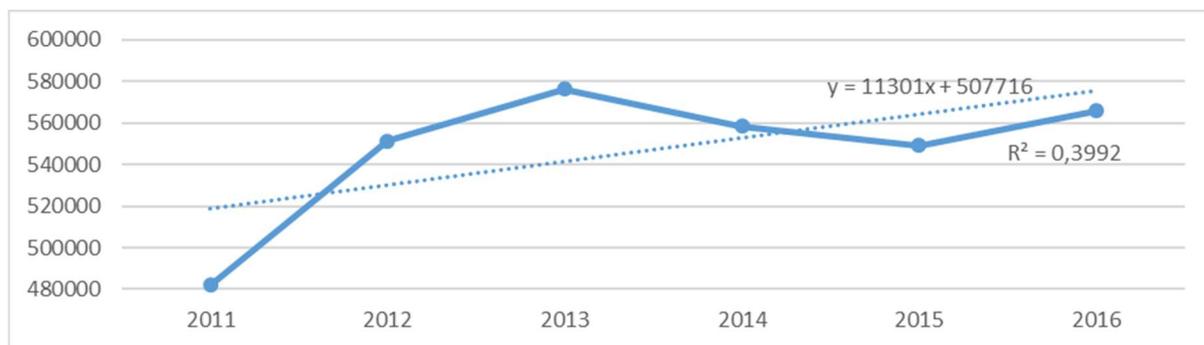
In the second stage of the study, which concerned the evaluation of the effectiveness of the human capital possessed through the effectiveness of management the following indices were used: HCR, Profit per FTE, Pre tax & interest profit per FTE, the relation of capital input to labour input for manufacturing food products and beverages in Poland and the level of work

efficiency dynamics measured by gross value added per employee in the manufacturing of food products and beverages in Poland.

The starting point is to present the trends in the number of people employed in the manufacture of food products and beverages (fig. 3). In the years 2011-2012, there was a decrease in the total number of people employed in the manufacture of food products and beverages in Poland (a decrease of 2,500 people between 2012 and 2011). In the following years, a steady increase was recorded until 2016 (up to a total of 414,300 people). Over the analysed period, the number of people employed in the food industry increased by 3.86%.

Between 2011 and 2016 the HCR index increased by 17.41% in enterprises manufacturing food products and beverages (fig. 4). The rising tendency over these years shows the increase in the level of productivity of human capital, and the process of the food industry adapting to the requirements of competition. In 2014 and 2015, a decrease in value was recorded (respectively by 3.1% and 1.7%), mainly caused by the decreasing level of sales revenues generated.

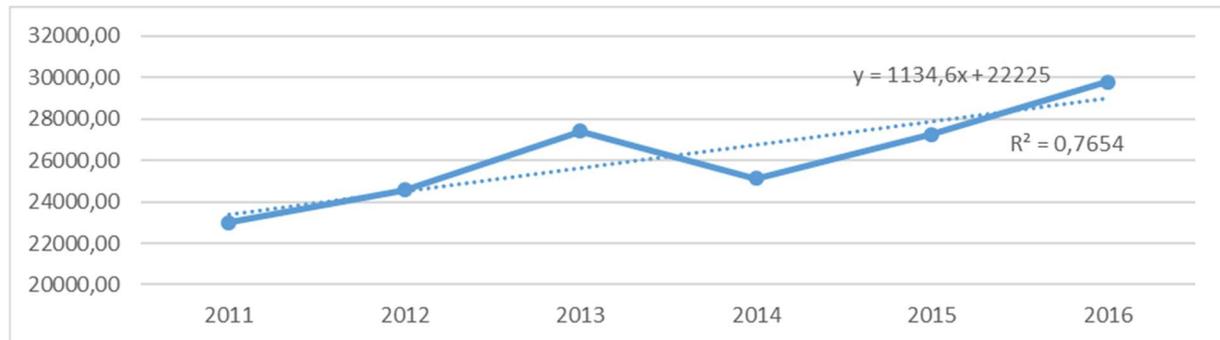
Fig. 4. HCR index for the manufacture of food products and beverages in Poland in the years 2011-2016 (at constant 2011 prices)



Source: own studies based on the Central Statistical Office (GUS).

In the later years, profits from sales in relation to the number of employees per FTE maintained an upward trend (fig. 5). In 2016, one employee of an enterprise manufacturing food products and beverages generated a profit on sales amounting to 29,788.97 PLN (the value of this index increased compared to 2015 by 9.26%, and compared to 2011 by 29.49%). The upward trend mainly resulted from sales revenues growing year by year. A decrease in value took place only in 2014, when, despite an increase of employment in the manufacture of food products and beverages (of 1.95%) profits from sales were more dynamic (a decrease in value between 2014 and 2013 of 6.49%).

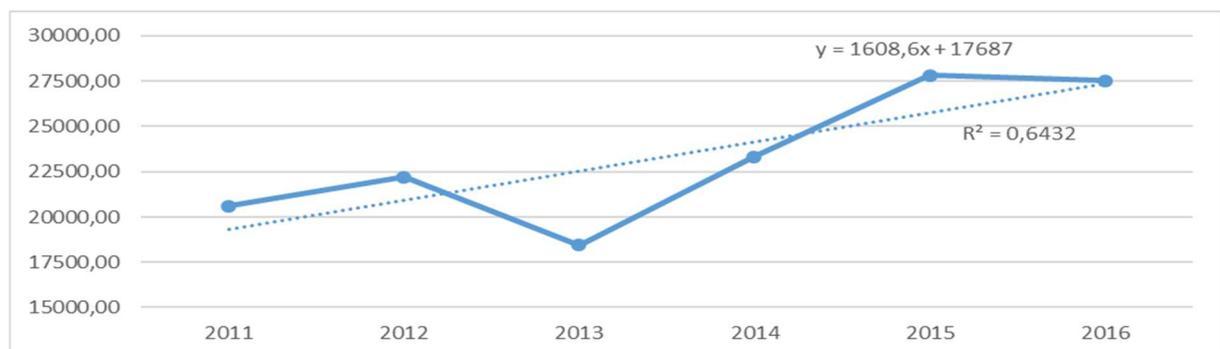
Fig. 5. Profit per FTE index for the manufacture of food products and beverages in Poland in the years 2011-2016 (at constant 2011 prices)



Source: own studies based on the Central Statistical Office (GUS).

As presented in figure 6, gross profit, that is profits not taking into account the part designated for tax and other obligatory payments, per employee in enterprises dealing with the manufacture of food products and beverages in 2016 amounted to 27,513.48 PLN (a slight decrease of 1.14% compared to 2015). The average value of the index in the years 2011-2016 amounted to 23,317.23 PLN (with relative standard error amounting to 3,752.54 PLN) and the actual productivity of human capital between 2011 and 2016 increased by 33,55%.

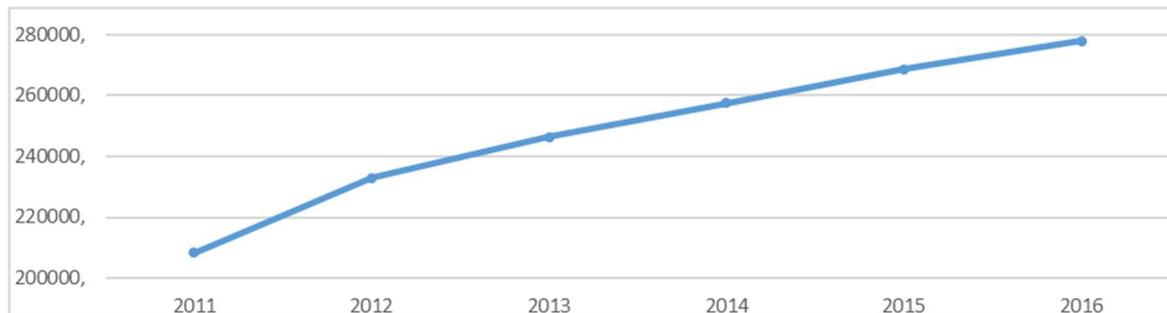
Fig. 6. Profits pre-tax & interest per FTE index for the manufacture of food products and beverages in Poland for the years 2011-2016 (at constant 2011 prices)



Source: own studies based on the Central Statistical Office (GUS).

Another important aspect is presenting the relation of capital to labour input (fig. 7). Also in this aspect, a growing tendency is visible (from 208,429.68 PLN per employee in 2011 to 277,920.57 PLN per employee in 2016). Between 2011 and 2016, the index increased by 33.34%.

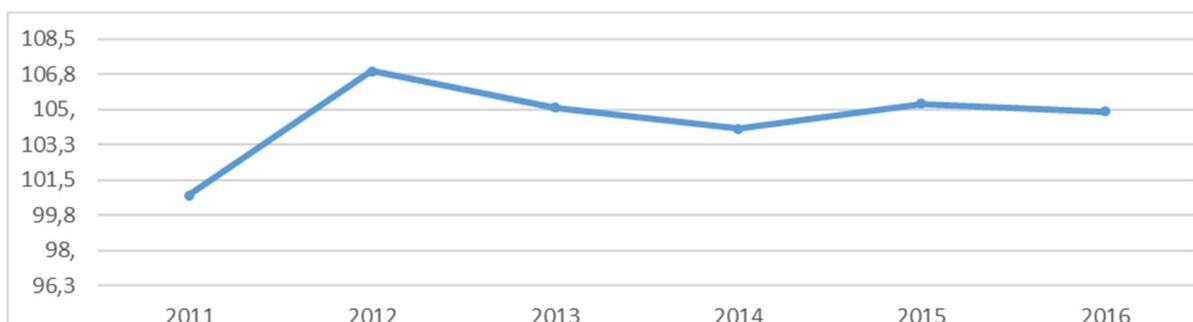
Fig. 7. Gross value of fixed assets in relations to total number of people employed in the manufacture of food products and beverages in Poland in the years 2011-2016 (at constant 2011 prices)



Source: own studies based on the Central Statistical Office (GUS).

In each of studied years, the value of the index of gross value added per employee in enterprises dealing with the manufacture of food products and beverages increased (fig. 8). The average level of increase in the years 2011-2016 amounted to 4.5%. This means that during the studied years the effectiveness of employees manufacturing food products and beverages increased, as well as global production corrected by the value of intermediate consumption generated by a single employee.

Fig. 8. Work efficiency dynamics measured by gross value added per employee for the manufacture of food products and beverages in Poland in the years 2011-2016



Source: own studies based on the Central Statistical Office (GUS).

The results of these studies show that the main index of human productivity HCR in enterprises dealing with the manufacture of food products and beverages between 2011 and 2016 increased significantly. This is a clear signal showing the increase in the level of the human capital productivity and the practical confirmation of the process of the adaptation of the food industry to the requirements of competition. The impact of human capital on the development of food industry companies should also be positively defined, as shown by the significant growth in profits obtained from sales by the enterprises studied in relation to the number of employees, which took place in the case of the FTE. A very good result was achieved on the level of human capital productivity between 2011 and 2016, increasing

by almost a third, after the calculation the of index of Profits pre-tax & interest per FTE for the manufacture of food products and beverages in Poland. The value of gross value added also increased per employee, which means an improvement in the effectiveness of employees dealing with this kind of manufacturing.

Conclusions

Taking into consideration the top-down assumption that the human capital plays one of the most important roles in the process of the development of the modern job market in the food industry, and is closely connected with human capital, the study attempted to show that an improvement in its value strengthens the financial results achieved by enterprises. The source search conducted, as well as the analytical studies performed, indicate several reflections and conclusions.

1. The success of the food industry results from the increase in labour productivity, the inflow of capital, investments in development, increasing concentration of production and the implementation of new technologies and innovations.
2. In the studied enterprises the level of use of human resources varied over the years (the coefficient of variation is 95,7%), which shows that the production capital of food industry companies was not always fully utilised, due to high costs of work, production and energy, as well as competitors' activities.
3. It has been stated that the majority of management staff and employees in food industry enterprises present a good degree of awareness of their companies' mission statements, which enables their goals to be achieved.
4. The entrepreneurs studied used pragmatic solutions during the realisation of personal functioning, as well as a common sense approach to the implementation of planned activities.
5. The increasing productivity indices between 2011 and 2016 are one of the determinants of an increase in the role of human capital, which enables an increase in quality of work and increasing abilities to generate profits for an enterprise.

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