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THE COMPLEX ECONOMIC ANALYSIS OF THE POULTRY AND THE PIG SECTORS

Case
Study

Keywords

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Abstract

Meat consumption has always played a prominent role in human nutrition. The pork and poultry industries are the two most important sectors in terms of meat consumption and production in the European Union and Hungary. Pork production has long been well ahead of poultry production but according to the latest research and forecasts it seems that the poultry industry will soon take the lead. The main objective of the paper is a detailed sector-level analysis. Currently the research comprises a small number of analyses of the two sectors. The research reviewed the international and domestic situation of the poultry and pork sectors as well as their development of production and consumption values. The paper focuses on the economic analysis, its theoretical background, role and tasks. It utilises the database provided by the Agricultural Economics Research Institute and uses various types of index numbers and the Du-Pont system for causal relationships among indexes. The database contains various balance sheets and profit and loss accounts for the period 2005-2015. The data for 2015 were available in three categories based on the Standard Production Value. In particular, the paper looks into the development of the asset and capital structure and the analysis of short-term solvency and profitability. The findings show that the development of the two sectors is in tune with international production and consumption trends.

INTRODUCTION

Since 1950 the Earth's population has increased from 2.5 billion to 7.5 billion people, so the global population doubled (Kozák, 2015) over 50 years between 1960 and 2010 and tripled in 60 years. FAO projections of 2018 show that the population will rise over 9 billion by 2050 (FAO, 2018). So far, birth control has been introduced in only one country in the world, China, but it has now been repealed (Wu et al., 2018).

Therefore, it is not surprising that the demand for essential food has also an increasing tendency. The main task of the food industry both currently and in the near future, is to be able to supply a growing number of people with high-quality, biologically high-nutrient food items that are essential for maintaining global health. Every participant in agricultural economy will have to make considerable efforts in order to solve this problem (Horn and Sütő, 2014), as according to FAO forecasts, the Earth's population will increase by another 30% in the next 40 years and demand for food is expected to grow by 60% (FAO, 2018).

However, food production also has to face a serious limiting factor. The global population may increase but the agricultural land devoted farming remains unchanged. Global land covers 13.1 billion hectares, or 29% of the Earth's total surface, of which only 9 billion hectares, that is 18% of the total surface are arable land. Of this area, approximately 5 billion hectares are agricultural land and 4 billion hectares are forests. Only 4% of the oceans, which account for 71% of the total surface of the Earth are fertile, namely suitable for fishing (Popp, 2013). In addition to the above, according to a 2015 study, the increase in meat consumption will also lead to the reduced diversity of wildlife (Machovina et al., 2015).

Humans are omnivores, they have always been, and they still are, therefore they need meat and food of animal origin (Szücs et al., 2017). Meat has played a prominent role in human life for thousands of years, since meat consumption is as old as mankind. Basic forms of meat processing such as cutting and chopping were already present in prehistoric times, while early preservation procedures such as salting were used in ancient times. Meat production and consumption is largely linked to agricultural production, while meat production and consumption are regulated by most religious standards and prohibitions, which are still present in the meat consumption habits of certain countries. Meat is one of the essential foods, but it has never been as cheap and readily available as currently (Szücs et al., 2017 and AKI, 2016).

The structure of food consumption is in constant change, as the consumption of higher value-added food - mainly meat and dairy products - is increasing due to the increased household income

resulted by economic development (Popp et al., 2017).

A study by Marques et al. (2018) draws attention to the fact that population and income growth will entail a global food demand in the upcoming years. Animal husbandry and livestock products are closely related to this tendency, and meat industry will have to face serious sustainability problems. The study also points out that meat consumption has a serious impact on economic growth and sustainability. Thus, a solution should be to reduce meat consumption, otherwise it has a negative effect on economic growth.

In 2016, global meat production grew by only 1% compared to the previous year to 317 million tonnes. Meat production of the USA and Europe counterbalanced the decline recorded in China and Australia. In terms of the sectors of meat production, the production of poultry and bovines has increased, while the production of pork and sheep meat has slightly decreased.

The production of poultry has registered rapid development in recent decades, due to the industrial production systems (Popp, 2013). According to OECD - FAO estimations, global poultry meat production amounted to approximately 118 million tonnes in 2017 and it might reach 131 million tonnes by 2026. The largest poultry meat producing countries, the USA, China and the EU, produce nearly two-thirds of the global production. At the end of 2017, the European Commission envisaged that the poultry meat production of the European Union will continue to grow by 2030 and that the 2018 production of the EU is expected to be close to 15 million tonnes, which is a slight increase compared to the previous year (AKI, 2017). The EU consumption of poultry meat per capita has been steadily increasing since 2013, and although it has not kept the same pace, the tendency remains. In 2017, the average annual consumption of poultry meat exceeded 24 kg. Total consumption in 2017 exceeded 14 million tonnes, which is expected to grow further in the upcoming years (AKI, 2017). Hungarian poultry meat production also shows quite large fluctuations during the examined period. According to the latest available HCSO (Hungarian Central Statistical Office) data, Hungary produced 490 thousand tonnes of poultry meat in 2015, of which nearly 230 thousand tonnes were exported. Our imports are insignificant compared to this volume. Since 1970, the poultry meat consumption per capita has doubled, reaching nearly 30 kg / person in 2015.

Global production and consumption of pork is quite different from that of the previously studied poultry meat. China is clearly outstanding in terms of both production and consumption, and the European Union is ahead of the United States. In China, consumption has been on an upward tendency since 2000, with the exception of smaller fluctuations.

This results in a similar tendency in production as well. Research by Chen et al. (2017) argues that one of the foundations of the success of the Chinese pig industry is that in 2005 several meat companies were integrated into co-operatives. According to the 2018 forecasts of FAO, this trend will not change later. By 2026, production and consumption are expected to increase by nearly 20 million tonnes compared to 2000, from 40 million tonnes to 60 million tonnes, with a further 8% increase between 2018 and 2026. In 2017, these three countries accounted for 80% of the global pork meat production and this is predicted to be the same situation this year (AKI, 2018). Pork production in Hungary shows fluctuations during the examined period; however, there has been a slowly growing tendency over the last ten years. Our imports have increased sharply after the year 2000 despite the fact that our consumption has dropped by 130 thousand tonnes since the 1990s. Pork exports in Hungary are lower than the imports but in terms of their actual value exports are higher than imports. Most of the pork is delivered to Romania, Japan, China and Italy.

Considering the tendencies of previous years, a number of researchers involved in the subject found that the production of poultry meat would exceed the production of pork. In his publication, József Popp in 2014 predicted that this change would take place in the early 2020s. According to the latest FAO data, poultry meat production already surpassed the production of pork in 2016, and according to further forecasts, this tendency will continue in the upcoming years.

MATERIAL AND METHOD

Special data was required for a deeper and more accurate analysis of the two sectors, which was provided by the Agricultural Economics Research Institute. The purpose of the economic analysis, which was never done before is to process the available data and to use the acquired information to increase the efficiency and productivity of management (Bán et al., 2017).

The research looked in to the database provided by the Agricultural Economics Research Institute. The database contains data on the various balance sheets and profit and loss accounts of enterprises operating in the Hungarian poultry and pig sector from 2005 to 2015. Thus, the investigation covers 11 years. The figures for 2015 were not only aggregated, but also available in three categories for two sectors, based on the Standard production value.

Two important issues need to be clarified in connection with the database. First of all, not all entries of the balance sheets and profit and loss accounts were available; the research relied only on

the data that was shared by the institute. Secondly, the data for the year 2015 are the most recent and the most suitable for the analysis since the data for the year 2016 are available with less detail from the Agricultural Economics Research Institute and the data for the year 2017 is only partially available.

The vast majority of the data in the database was provided in 1000 HUF / livestock unit. Some of the key figures in the balance sheet and profit and loss accounts were available in other units as well, e.g. 1000 HUF/farm, 1000 HUF/1000 EUR standard production value. Calculations were mostly carried out using the 1000 HUF / livestock unit format.

The research on the sectors forming the database started by reviewing the basic data, namely by analysing the key figures of the balance sheet and followed by the vertical and horizontal analysis of balance sheet data, as well as the calculation and analysis of its ratios and index numbers. As described earlier in the introduction of the database, the data for 2015 in both sectors were further narrowed down to three size categories, so for 2015, all the analyses were performed separately in order to compare the performance of these size categories.

The solvency of the two sectors was then looked into by calculating and analysing the different liquidity ratios and the debt ratio. Since solvency alone was considered insufficient the analysis continued with the analysis of profitability (Brealey and Myers, 2011).

The examination of profitability included the analysis of the trends in revenue changes, the calculation of various revenue-proportional ratios and the analysis of their content. The analyses were completed by applying the Du-Pont index system, as this allows the objective comparison of different sectors (Brealey and Myers, 2011).

RESULTS AND THEIR EVALUATION

The research debuted with the analysis of the development of the most important balance sheet values of the two sectors, as represented in Figure 1. Between 2005 and 2015, the total asset value of the pig sector shows a clear and steady growth, since by the end of the period this value increased to more than double. The total asset value of companies operating in the poultry sector was almost three times higher at the beginning of the same period, but in this case there is an approximately 10-20% fluctuation year after year. Equity values of both sectors show a similar trend to the value of all their assets. The values of after-tax earnings and profit or loss clearly show a much higher growth rate in the poultry industry than in the pig sector. The after-tax earnings of the poultry sector increased almost sixfold between 2005 and 2014, and after-tax earnings increased tenfold. In

the same period, the after-tax earnings and the annual profit of the pig sector fell by 10%.

As a next step, the liquidity of the sectors was examined as these indexes measure the ability of the company to meet its short-term liabilities. The ratio compares the liquid assets of the company to its short-term liabilities (Fenyves et al., 2016). Several types of liquidity ratios were calculated. General liquidity ratios of both poultry and pig sectors developed favourably between 2005 and 2015. The development of the quick liquidity ratio of poultry keepers can be considered more stable and balanced while in the case of pig farmers, the value of this ratio shows larger fluctuations.

Following the analysis of the liquidity ratios, the debt ratio of the two sectors was calculated and analysed. The debt ratio shows the extent to which the company finances its assets through foreign capital. It therefore helps deduce the capital strength of a company or in this case, a sector (Brealey and Myers, 2011). Debt ratios of the poultry sector came close to 50% at the beginning of the period under discussion, which means that companies operating in the sector could finance only half their assets based on their equity. By 2015, the value of the ratio seems to be stabilizing, as it decreased by approximately 10%. Debt ratio of the pork sector can be considered favourable, as the highest value of the indicator was 40% between 2005 and 2015, which is not a critical value and it was several times below 30%. These findings are shown in Figure 2.

Subsequently, the development of the revenues of the two sectors was examined. This is a very important factor in terms of the analysis of profitability. Figure 3 shows the development of the revenues of the sectors. Profitability is influenced by various factors. It is not sufficient to analyse different indexes separately as they provide an overall picture of companies or in this case of the two sectors. An industry might be extremely profitable despite the fact that profits are average or unfavourable compared to the invested capital. Therefore, it is necessary to evaluate the profitability indexes together with other indexes (Karai et al., 2015). After examining the changes of revenues, it was clear that the next step was to calculate the revenue-proportional. These indexes compare an earnings category to net sales revenue. Depending on what earnings category is considered, multiple ROS ratios can be calculated, which are summarized in Table 1 below. With regard to the indexes, it needs to be emphasized that the poultry sector is performing better in this regard, while the pig sector is declining.

Finally, calculation of the Du-Pont index system was applied to obtain a more accurate picture of the two sectors. Calculation and analysis of the Du-Pont index system was important because it breaks down the two ROI indexes into components; the

individual components allow comparisons within the sector or between different sectors, which is the main direction of the present research, as comparing the productivity of domestic poultry and pig keepers was the research objective. These values are illustrated in Figure 4. The high ROE values in the poultry sector may even represent a business risk, but in this case, the high ROE value reflects the increase of equity within the poultry sector through the equity multiplier. However, ROE values of the pig sector show fluctuations year after year, due to the continuous deterioration of the after-tax profit, which affects the return on equity through the ROA ratio.

Values of the ROA ratio are influenced by the velocity of turnover ROS ratio. According to technical literature, velocity of turnover varies widely among sectors, and a value around 1 can be acceptable for sectors with high asset demand (Reilly and Brown, 2011, Siklós and Veress, 2016). The poultry sector achieves a turnover velocity above 1 every year of the research, however in the case of the pig sector the value of this index is below 1. This is due to the fact that the revenue of the pig sector in each analysed year is lower than the total value of their assets, as opposed to the poultry sector, where their sales revenues exceed the value of their total assets. Thus, the effect of the above is reflected in the return on assets index, which of course, seems to be reflected in the return on equity.

CONCLUSIONS

The primary goal of the present research was to analyse the situation of the poultry and pig sector in Hungary in terms of their wealth, capital structure, financial situation and profitability between 2005 and 2015.

The research examined the data of available annual statements using index numbers. In particular, the study dealt with the changes of asset and capital structure, and the analysis of short-term solvency and profitability. The Du-Pont system was applied to show the causal relationship among the indexes, because this approach provides a potentially objective comparison.

The objective of the study is therefore achieved, as the findings show that the economic development of the two sectors follows the same pattern as international production and consumption trends, and it has a clear impact on the financial situation and income as well.

The research findings clearly reflect the wealth, financial situation and profitability of the domestic poultry and pig sectors and the fact that these sectors are worth researching.

At the same time the limitations of the conducted research are clear as its main conclusions might

change in the future along with the changing data. Updating the database can be an important research task in the future. The analyses can be further expanded by utilizing efficiency indexes.

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TABLES & FIGURES

Table No. 1
ROS ratios of the poultry and pig sectors between 2005 and 2014

<u>Poultry</u>	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gross ROS	27%	26%	22%	24%	22%	20%	19%	22%	20%	25%	24%
Operational ROS	4%	1%	1%	5%	3%	3%	5%	6%	5%	7%	11%
ROS before taxes	3%	0%	-1%	3%	2%	2%	4%	6%	5%	7%	10%
Net ROS	2%	0%	-1%	3%	2%	2%	3%	5%	4%	7%	10%
<u>Pig</u>	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gross ROS	41%	40%	26%	24%	27%	28%	24%	27%	15%	25%	24%
Operational ROS	14%	5%	-1%	2%	4%	4%	8%	10%	-2%	7%	0%
ROS before taxes	10%	2%	-2%	1%	3%	3%	7%	9%	-3%	5%	-1%
Net ROS	9%	1%	-2%	1%	3%	3%	6%	8%	-3%	5%	-1%

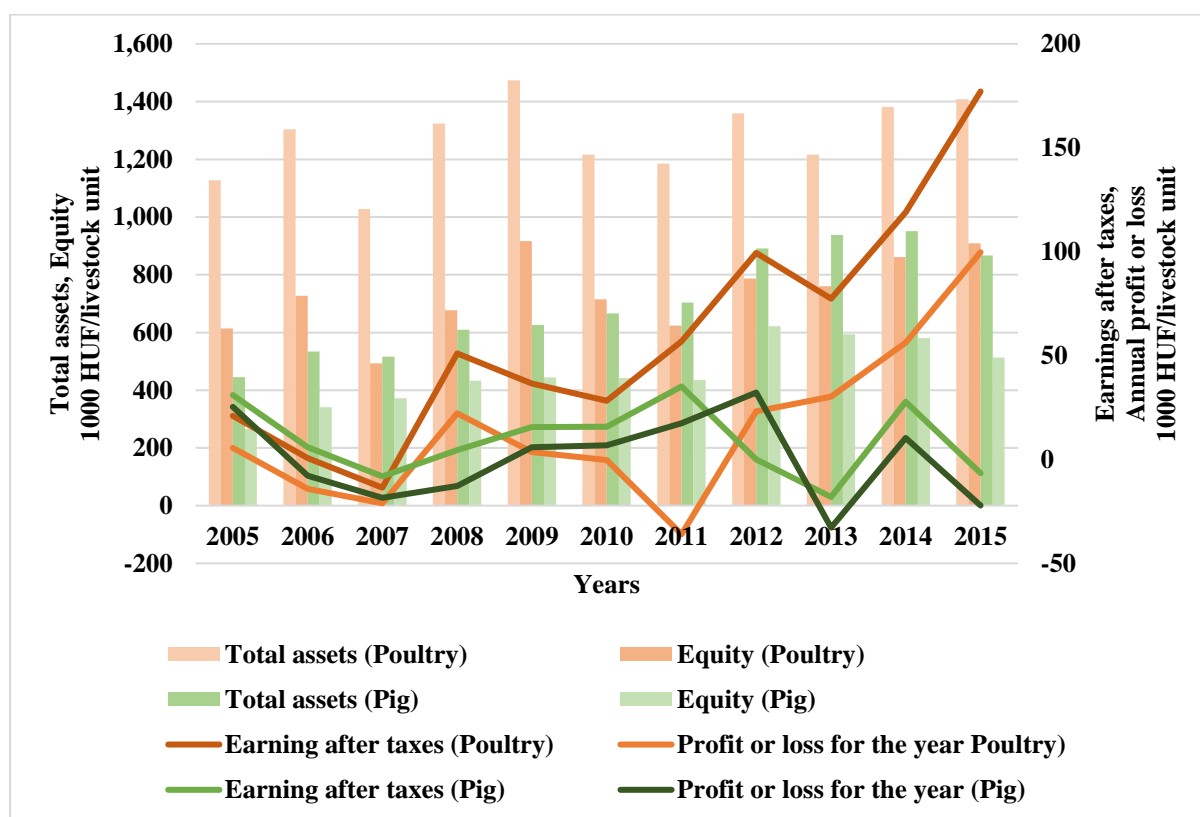
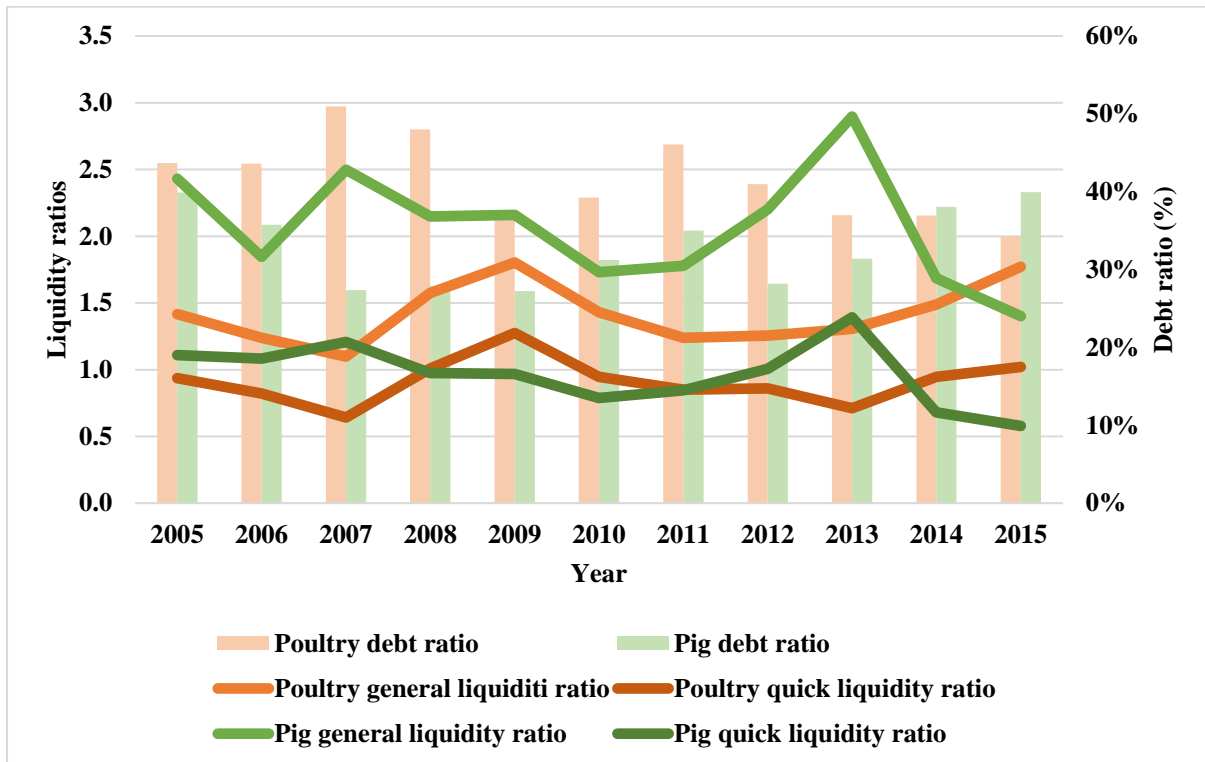


Figure No. 1
Analysis of the total assets, equity, earnings after taxes and annual profit or loss of domestic companies operating in the poultry and pig sector between 2005 and 2015



FigureNo. 2
Liquidity ratios and debt ratios of domestic poultry and pig keepers between 2005 and 2015

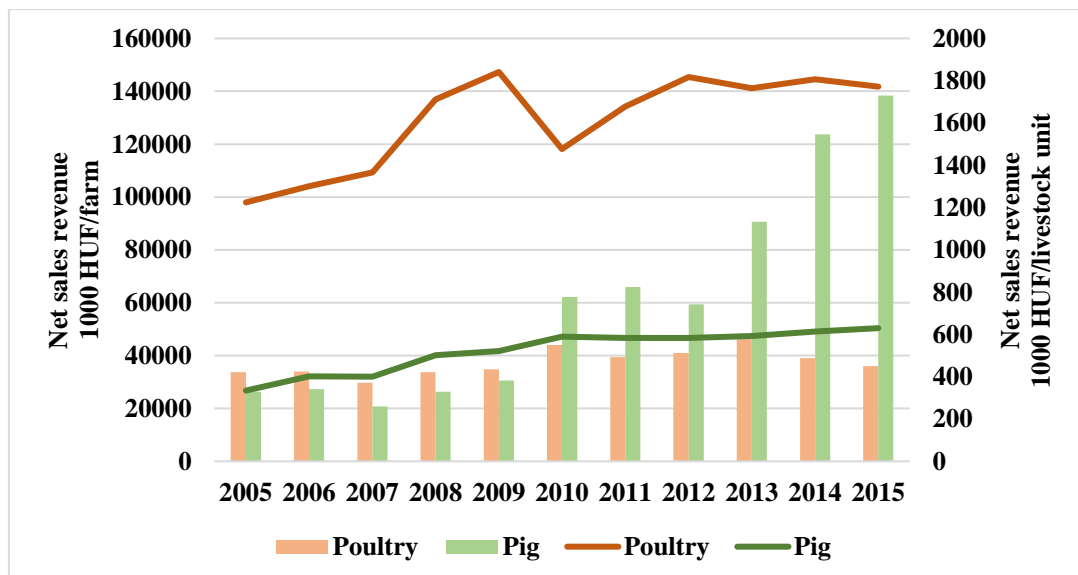


Figure No. 3
Net sales revenues of domestic poultry and pig keepers between 2005 and 2014 expressed in different units

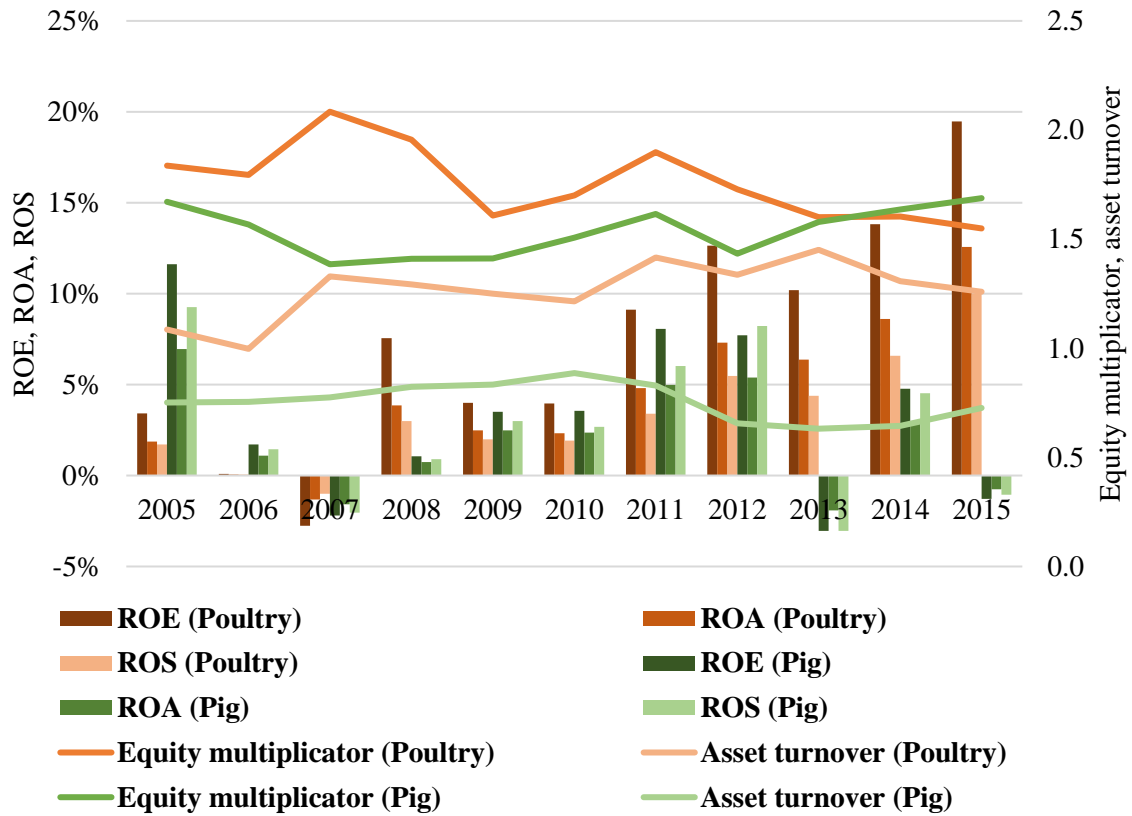


Figure No. 4
 DuPont index values of companies operating in the domestic poultry and pig sector between 2005 and 2015