

INTERACTION OF PRODUCTION COST, PRICE AND LABOUR FACTORS IN INCREASE OF COMPETITIVENESS IN AGRARIAN SECTOR OF AZERBAIJAN

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Abstract

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Production cost, interaction of price and labor factors in increase of competitiveness in agrarian sector of Azerbaijan has been studied in this article. There are theories that reflect role of economic development in this article. Taking into consideration that price and production cost is the main index in comparison competitiveness in agriculture in research; it has been applied to theoretical thoughts and research work about these categories. Among indices used in study of current situation and competitiveness in agriculture it is emphasized role of macroeconomics, economic and financial index. In analysis part it is introduced models that reflect dependent of selling price of agricultural product on prime cost and labor cost which is main factor in increase of agriculture of Azerbaijan and conducted analysis of complex (multiple regression) correlation-regression. Excluding some products, it is defined line dependent of selling price of many agricultural product on prime cost and labor cost.

Key words: agrarian sector; competitiveness; price; prime cost; labor cost; complex (multiple regression) regression

Introduction

In the period of prosperity in industrial revolution, the role of agrarian sector did not have any formal theory in economic development. So there was no development, including in agrarian farm. There is an argument that in the beginning of XIX century approximately 75-90% of population worked in agrarian farm (Johnson, 1997). Classical economists value agrarian sector as traditional sector of low productivity affecting to economic increase, which supply other part of economics with food, labor and capital (Hazell and Thurlow, 2007). Attitude to agrarian sector was changed in the 1950s due to authors like Lewis (1954). He approved that industry revolution is effective joint with agrarian revolution

and agrarian revolution will lead to high productivity. That will guarantee food supply for long-term economic increase. Change of attitude to the role of agrarian sector in economics was in progress in the 1960s too. Positive result of green revolution highlighted that agrarian farm was able to play active role in economic development (Hazell and Thurlow, 2007). So, Schultz (1964) emphasized that applying green revolution with science, technology can modify agrarian sector to modern sector in a short period. Besides it Johnston and Mellor (1961) with their famous original articles identified the role of agrarian farm in economic development. In additional, they valued it as main dynamics in different stages of economical increase, especially, of industrialization. Hazell and Thurlow (2007) noted that agrarian sector

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plays active but not passive role in economical increase.

In 1980-1990 debuts about role of agrarian sector in development shifted to villages and proceeded to regional level, regional flatness (Hazell and Röell, 1983; Haggblade and Hazell, 1989; Haggblade et al., 1991).

In 1970 nearly all researchers searched the role of agrarian sector in economic development. In that case they bothered about total product increase, volume of production per capita, but not income distribution (Fields, 2004).

Literature Summary

Taking into consideration that price and production cost is main index in comparison of competitiveness of agrarian farm in research, let's apply to theoretical thoughts and research work about these categories. Price theory is interested in disclosing economic activity in terms of creating and transferring values, including trade in goods and services between different economic agents (Tellis, 1986). Friedman (1990) clarifies how price is generated, formed and how is price functioned to coordinate economic activity. Later Friedman generally explained in details two reasons why we didn't know pricing and pricing theory. The first reason is that we should comprehend what the society like with what we are surrounded, has been formed. The second reason is that we should understand how the price is defined, how important it is in understanding of many economic problems, prices defined in wrong way is in the root of the several economic mistakes.

Many scientists put forward different conceptions about product price. So according to Agwu and Carter (2014) price is an only generator of profit and is valuation set on product. In addition, price is sum of all value that customer gives for concession to purchase and use product (Kotler et al., 2001). Baker et al. (1996) noted that the price is a mechanism that supplies two powers to stay equal. Stanton (1981) said that the price is just an offer and experiment that seller uses for exchange. Price is a money-credit valuation that a seller uses for exchange. Ezeudu (2005) noted that price is an exchange valuation of commodity and service. Schewe (1987) defined the price as fee for commodity and service.

Methodology

Competitiveness means to endurance the world economics, appropriate increase of population's real life level, fair division of profit, to provide with job the people who desires to work, economic condition stimulates increase of life level of future generation (Landau, 1992). In addition, in order to specify competitiveness in national level, it is needed

to search productivity determinates and productivity norms in some sectors of industry and industrial segment but not in general economics (Porter, 1990). However modern real world denies many provisions of comparative domination of trade, agriculture and tax politics. Comparative domination belongs to effective, well-functioned, undistorted markets. Competitiveness belongs to factual, real world (Barkema, 1990). To possess competitiveness in certain sectors means to have customers who are positively different from other potential sellers in foreign countries, to be able to supply with commodity and service in reasonable price, in necessary way and on time. In this case it meant at the worst to return alternative costs to use of recourses (Sharples and Milham, 1990). To be competitive industry is to obtain share in internal and/or external markets and to be able to keep it for a long period (Agriculture Canada, 1991). Competitiveness of economics, its separate areas, also agriculture was researched by several economists. We can group them as following. Competitiveness of agricultural and agrarian product in European Union countries was researched by economists such as Mulder et al. (2004), Ball et al. (2006), Carraresi and Banterle (2008), Drescher and Maurer (1999), Banterle and Carraresi (2007), Wijnands et al. (2008), Venturini and Boccaletti (1998), Mulder et al. (2004).

Among the scientists who researched international competitiveness of separate countries were: Bavorova (2003), Toming (2007), Nivievskyi and Von Cramon-Taubadel (2008).

A lot of scientists, such as Bojnec and Fertö (2009), Van Berkum (2009), Qineti et al. (2009) researched competitiveness of agrarian division in Central European and Eastern European countries. Some scientists researched competitiveness of agrarian division of new members of EU (Gorton et al., (2000), Gorton and Davidova (2001). Competitiveness of separate product production was approved by the following scientists: Thorne (2005), Bavorova (2003), Van Berkum (2009).

It is analyzed economic indicator and effect in competitive environment without subsidy and later with subsidy in planting in mountain and less satisfactory regions of Greece (Oxouzi. et al., 2012). Kizilaslan, et al. (2011) researched competitiveness of cattle-breeding. In addition, it is researched effect of decrease of transport fees on corn's competitiveness in the world markets (Lopes et al., 2017). It was studied possibilities of decrease of milking cost at the expense of module approach in cattle-breeding in Bulgaria (Sabkov et al., 2016). It was analyzed prime cost, profitability and agrarian industry risks of separate product in plantations (Bendlin et al., 2016). Comparative analysis of agrarian farms was conducted Bulgaria and Norway, factors affecting

development and state policy was researched (Stoykova and Asheim, 2011).

Many scientists studied product costs in agrarian farm: Ahearn and others (1990), Cesaro et al. (2008), Gallagher et al. (2006), Sharples (1990). Besides it, Celik and Peker (2009) were studied mushroom production costs in developed countries. Keskin et al. (2010) analyzed tomato product costs and efficiency of manpower. It is researched definition of product unit cost in main areas of production. Erdal et al. (2009) studied potato product production and price proportion.

As we will use complex (multiple regression) regression in research, let us use it in methodology too. According to Pedhazur (1997) regression analysis has 2 using are in scientific literature: prediction and explanation. Complex (multiple regression) regression (MR) with dependent and independent variables is used for analysis of dependent and independent variables on basis of data (Pedhazur, 1997). It is an important component of common line model (Zientek and Thompson, 2009). In fact, MR includes most of the mathematical methods generally taught in education. (Henson et al., 2010). It is impossible not to touch “collinearity” or “multicollinearity” which creates difficulty while we use MR in our research. “Collinearity” or “multicollinear” indicates the non-zero correlation of the free variables. (Thompson, 2006). Independent variables are mostly correlated each other in practice.

Multicollinearity can cause complication of research results and can create difficulty in interpretation of research. Nimonidr (2010) noted that correlated independent variables can complicate interpretation of results. This makes many researchers avoid from multicollinearity among observed variables. Stevens (2009) said that multicollinearity is a real problem for the researcher, who uses complex regression. Nonetheless, Henson (2002) noted that if we consider more analytical information, multicollinearity should not be considered a problem. The essence is that if the researcher additionally adds structural coefficients to the standard weights, multicollinearity will not be problematic during the complex regression and eventually in any other common analysis a linear model.

Although multicollinearity MR does not act as a direct statistical condition, its effect to regression influence makes it difficult to interpret as a function. (Osborne and Waters, 2002). Many researchers interpret MR results as predominantly standardized (beta, β) or non-standard (inclined) regression influence. (Courville and Thompson, 2001; Zientek and Thompson, 2009). When it comes to multicollinearity, focusing on regression influence is a good source of limited information. In some cases, it causes incorrect interpreta-

tion. However, in many cases, it is seen that the authors have acknowledged the importance of the free variables based on the results of the statistical significance tests of the zero hypothesis (H_0) of the regression, due to the inadequacy of multidimensional complex relationships between free and dependent variables. As a regression line for complicated regression, the following will be used.

$$y = a + b_1 \times x_1 + b_2 \times x_2 + \dots + b_n \times x_n$$

Analysis of the Current Situation and Competitiveness of the Agrarian Sector

The role of macroeconomic, economic and financial indicators is crucial among the indicators used in the analysis of the current situation and competitiveness of agriculture. They are a comprehensive and extensive database of information about the economy, industries, and agrarian sector. Let's look at the economic indicators of economic entities in this area, which are the foundation of economic development in the agrarian sector.

The specific weight of service and intermediary organizations has increased at the expense of decrease of special weight of specified special weight. Simply, there was a very small increase in the share of state-owned enterprises.

During the analyzed period, the aggregate profit of agricultural enterprises at actual prices in 2016 increased by 76.0 times compared to 2000, 5.8 times more than in 2005, and by 18.7% compared to 2010, compared with 7.5% in 2013 and 17.3% in 2014.

It should be noted that the aggregate output of agriculture by actual prices of relevant years is 17.3 times more than in 2016, 4.7 times as compared to 2005, 99.5% compared to the year of 2010, labor productivity – total product per employee was 26.9 times in 2016, 5.1 times more than in 2005, and increased by 22.8% compared with the same period last year. 2.2 times more than in 2010, an increase of 17.3 percent compared to 2013 and 0.1 percent compared to 2014. Productivity of main type of agricultural crops for last 16 years categorized into groups and introduced below.

So, in the period between 2016 and 2000 the cotton productivity increased slightly more than 2 times, and the productivity of the remaining plants decreased from 114.4% (tobacco) to – 184.4% (seed for sunflower). The production of tobacco and potato declined by 1.2% and 8.7%, respectively, between 2016-2005, except for sugar beet (287.9%), and the growth of other crops was 7.4-44.8%. However, in 2016-2010 the productivity of potatoes decreased (6.2%), and the productivity of other crops increased from 1.7-52.8%, the decline in tobacco has been 10.6% in the last three years, in potatoes – by 10.5%, in

sunflowers by 8.8% and in cotton by 2.6%. Over the past three years – in 2016-2013, the decline in tobacco has been 10.6%, in potatoes – by 10.5%, sunflowers for seed by 8.8% and in cotton by 2.6%. Productivity of other products increased with 2.6-14.6%. Finally, with the exception of tobacco (a decrease of 1.5%) in the period from 2016 to 2014, the productivity of other remaining plants increased from 2.3 to 31.3%.

One of the key factors in raising the competitiveness of the Republic's agriculture is the relative decline and decline of the prime cost.

It is clear from the statistical data of the prime cost of one centner of separate agricultural products that in 2016 the prime cost of cereals and cereal legumes are 1.8 times less than in 2000, 2.1 times more than in 2005, 10.3% compared with 2010, and decreased by 1.3% compared to 2013 and dropped by 13.3% compared to 2014, with 41.4%, 70.8%, 1.2% percent increase compared to 2013 and 28.2% and 46.5% respectively, while the sugar beet prime cost for processing was 37.2%, 42.1%, 50.3%, 38.0% and 21.3%, while tobacco increased by 11.5%, 89.6%, 60.9%, 19.1% and 41.6% respectively.

As for the change in the cost of green tea leaf, the cost of green tea leaf increased 2.6 times, 2.7 times, compared to the comparable years in 2016, decreased by 7.9%, 25.5% and 22.7%, the cost of potatoes fluctuated and fell to 63.1 percent in 2015 compared to 2000, an increase of 95.7 percent compared with 2005, which is 28.7 percent less than in 2010, down 2.3% percent more than in 2013 and decreased by 12.7% compared to 2014. The prime cost of vegetables grown on open areas increased by 63.9%, by 2.7 times and by 14.5% in 2016 compared with 2000, 2005 and 2014 and compare to 2010 and 2013 there was decrease of 16.2% and 9.8%, the prime cost of melons increased by 2.3 times, 36% and 0.3% in 2016 compared with 2000, 2005 and 2010, decreased by 10.5% and 14.3% compared with 2013 and 2014. Prime cost of fruit and berries constantly increased. Thus, there was increase in 2016 by 7.5 times, 6.1 times, 77.9%, 71.8% and 32.7% compared with 2005, 2010 and 2014. The grape was noted to increase by 2.6 times, 56.9%, 15.5% and 11.1% according to this year.

Because the price factor is an indisputable factor in the competitiveness of agricultural products, it is possible to look at the labor productivity of one centner of agricultural products in order to justify the factors of its dynamics and to suggest increasing the wages of workers in this field. Thus, labor productivity per centner of cereals and cereal legumes increased by 7.8%, 11.1% and 0.9% in 2016 compared with 2000, 2010 and 2013, and in 2005 and 2014, and 0, 6% and 2.7% respectively, while labor costs per one centner of raw cotton fell by 10.2%, 3.3%, 0.2%, 0.2% in the same year and did not change compared with 2014 Although labor productivity for a centner of sugar beet,

intended for processing, in 2015 decreased by 16.1% compared to 2000 compared with 2005, 2010 and 2013, the employment rate was 2.6%, 0, 8%, an increase of 0.8% and remaining unchanged in 2014 compared to 20.2% in 2015 compared to 2000 and 8.8% in 2005 compared to 2010, 3.2%, which is 1.3% more than in 2013, and remains unchanged compared to 2014. Labor cost to one centner of green tea leaves increased by 14.4% in 2016 compared with 2000 and 2005, decreased by 15.3%, 7.8% and 1.4% compared with 2010, 2013 and 2014, labor cost to one centner of potato decreased by 10.0%, 11.0% and 2.6%, remained unchangeable compared with 2013 and increased by 0.4% compared with 2014, labor cost to one centner of vegetable on the open area decreased by 8.7% and 3.0%, increased by 0.4% compared with 2010, remained unchangeable compared with 2013 and 2014. Labor cost to one centner of melons increased by 5.2%, 2.5%, 0.8% compared with comparable years, decreased by 0.2% compared with 2013 and 2014, labor cost to one centner of fruit and berries decreased by 5.8%, 2.6%, 2.1%, 0.5% and increased by 7.5%, labor cost to one centner of the grape increased by 1.9% in 2015 compared with 2000, decreased by 1.1 %, 0.5% 1.4% and 0.5% compared with 2005, 2013 and 2014.

Labor cost to one centner of weight gain of cattle during analyzed year decreased by 10.1% in 2016 compared with 2000, 5.9% compared with 2005 and 0.1% compared with 2013, increased by 0.3% and 0.5 compared with 2010 and 2014, labour cost to one centner of weight gain of sheep and goat decreased by 0.5%, 0.8%, 0.2% and 0.1% in 2015 compared with 2000, 2005 and 2014, increased by 1.4% compared with 2010, labor cost to one centner of pig increased by 37.8% and 15.8% in 2015 compared with 2000, 2005, increased by 0.3%, 4.9% and 3.5% compared with 2010, 2013 and 2014, labor cost of one centner of weight gain of poultry increased by 4.5 %, 0.6 % and 0.1 % compared with 2000, 2005 and 2013, decreased 0.4% compared with 2010 and remained unchangeable compared with 2014.

Labor cost to one centner of weight gain of milk increased by 11.7% and 0.4% in 2015 compared with 2000 and 2005, decreased by 0.4%, 0.6% and 0.8% compared with 2010, 2013 and 2014, labor cost to one centner of weight gain of wool decreased by 2.6% in 2016 compared with 2000, increased by 2.61%, 4.2%, 2.1% and 2.7% compared with 2005, 2010, 2013 and 2014, labor cost to one centner of egg gain (one thousand pieces) was 5.8% and 0.2% in 2015 compared with 2000 and 2013, decreased by 6.6% and 2.2% compared with 2005 and 2010, remained unchangeable compared with 2014.

As for the selling price for one centner of agricultural products, we can say that the selling price of centner of cereals and cereal legumes increased by 2.7 times in 2016 compared with 2000, by 1.8 times compared with 2005, decreased by

3.3% compared with 2010, 7.0% compared with 2013 and 3.0% compared with 2014, selling price for one centner of raw cotton increased by 3.1 times, 43.8%, 6.5% and 3.8% in 2016 compared with 2000, 2005, 2010 and 2013 and decreased by 3.6% compared with 2014, selling price for one centner of sugar beet decreased by 97.9% and 1.3% in 2015 compared with 2000 and 2010, increased by 65.0%, 1.9% and 0.2% compared with 2005, 2013 and 2014, selling price for one centner of tobacco relevantly increased by 2.3 times, 2.1 times, 43.0%, 30.8% and 27.9%, selling price for one centner of green tea leaf increased by 3.0 times, 3.2 times and 7.2% in 2016 compared with 2005 and 2010, decreased by 10.6 %, 11.4% compared with 2013 and 2014, selling price for one centner of potato increased by 87.2%, 2.2 times and 29.7% in 2016 compared with 2000, 2005 and 2013, decreased by 37.1% and 2.9% compared with 2010 and 2014, selling price for vegetable on the open area increased by 3.7 times, 3.5 times, 4.9% and 9.6% in 2016 compared with 2000, 2005, 2010 and 2013 and decreased by 14.3% compared with 2014. Selling price for one centner of melons increased by 3.9 times, 90.3% and 8.0% in 2016 compared with 2000, 2005 and 2014, decreased by 1.5% and 1.2% compared with 2010 and 2013, selling price for one centner of fruit and cherries increased by 7.4 times, 3.7 times, 11.8%, 48,0 % and 3.9% in 2016 compared with 2000 relevantly to those years, selling price for one centner of grape increased by 3.5 times, 19.4% and 17.5% in 2016 compared with 2000, 2005 and 2010, decreased by 1.9% and 3.2% compared with 2013 and 2014.

Selling price for one centner of weight gain of cattle and poultry increased by 2.3 times in 2016 compared with 2000, increased by 46.1% compared with 2005, decreased by 5.3% compared with 2010, increased by 6.6% compared with 2013 and 1.6% compared with 2014, selling price for one centner of weight gain of cattle increased by 3.3 times, 92.3% and 25.7% in 2016 compared with 2000, 2005, 2010, decreased by 13.2% and 4.9% compared with 2013 and 2014, selling price for centner of weight gain of sheep and goat increased by 4.5 times, 2.6 times and 41.0% in 2015 compared with 2000, 2005, 2010, decreased by 4.8% and 3.2% compared with 2013 and 2014, selling price for one centner of weight gain of pig increased by 88.7% and 25.0% relevantly to those years, decreased by 58.0%, 54.5% and 25.7% compared with 2010 and further comparable year, selling price for one centner of weight gain of poultry increased by 75.5 %, 42.1 %, 6.9 % and 0.9% in 2016 compared with 2000, 2005, 2013 and 2014 compared with 2000, 2005, 2013 and 2014, decreased by 6.2 compared with 2010. Selling price for one centner of weight gain of milk decreased by 5.0% in 2015 only compared with 2013, increased by 2.5 times, 2.0 times, 25.1% and 4.8% compared with the rest of the years, selling price increased by 3.6 times,

2.0 times and 2.2% in 2016 compared with 2000, 2005 and 2013, decreased by 5.3% and 1.3% compared with 2010 and 2014, selling price for one centner of egg gain (one thousand pieces) increased by 2.6 times, 86.9%, 13.5%, 15.3%, 15.8% relevantly. It is clear from the above that indices of yearly deviation are natural, but there must be certain legality. All of this calls for a serious approach to this area and elimination of uncertainties, in particular, minimizing differences in economic and financial outcomes in the years. Such difference of gain rates of prime cost, labor cost and selling price for one centner of calculated and introduced agricultural product is evidence to presented deviation. We can note it from dependent models of selling price of one centner of separate agricultural product in prime cost and labor cost.

Econometric Analysis

It is clear from analysis (Table 1, Figure 1) that between 1995-2016 gain rate of prime cost of a centner of manufactured product in agricultural prices was average 8.92% annually, gain rate of labor cost to a centner of product was average 0.09% annually, gain rate of selling price for a centner of product was average 16.95% annually. This, naturally, can be evaluated as a result of the intermediaries' price additions.

In order to increase competitiveness in agriculture and its enterprises it is important to improve structure of cost spent on production. Thus, if we compare with 2015 it appears that special weight of salary payment in structure of cost spent on production of agricultural products approximately increased by 4.2% between 1990–2015, being subject to deviation the material costs increased by 3,5%, amortization of main means 11.8%, insurance cost 27.1%, other costs 30.8%. Special weight of salary costs in structure of cost spent on production of agricultural product in planting increased by approximately 5.7% between 1990-2015, being subject to deviation the material costs increased by 8,8%, amortization of main means 13.5%, insurance cost 19.5%, other costs 5.4%. Special weight of salary costs in structure of cost spent on production of agricultural product in cattle-breeding decreased by approximately 3.8% between 1990-2015, being subject to deviation the material costs increased by 0.5%, amortization of main means 14.8%, insurance cost 51.7%, other costs 2.9%. As special weight of insurance cost is very small, it can leave neglected.

If we add to the general structure of costs for agricultural production (9.33%), payment for services rendered by other organizations and non-residents in the structure of expenses amounted to 13.57% of outsourcing services, which is 19.49%, we can assume that we have significant weight. 22.90%. It is not less.

Table 1
Econometric Analysis

	const.	C	LC	R ²	F	P- (F)	DW
1	2	3	4	5	6	7	8
Y1	-7.95241 (-0.7758)	1.57948*** (6.487)	0.620474 (0.6245)	0.735561	F(2. 19) 26.42511	3.25e-06	0.709935
Y 1 A	-1.77194 (-0.6735)	1.63622*** (7.356)		0.730132	F(1. 20) 54.11039	4.16e-07	0.631254
Y 2	219.786*** (5.196)	0.293508** (2.528)	-3.16649*** (-4.764)	0.606283	F(2. 19) 14.62902	0.000143	1.334392
Y 3	6.27450 (1.670)	-0.979306* (-1.733)	0.060393 (0.2479)	0.142397	F(2. 19) 1.577387	0.232391	0.634722
Y 3A	7.10443*** (4.268)	-0.990661* (-1.802)		0.139623	F(1. 20) 3.245613	0.086711	0.691667
Y 4	326.210*** (11.01)	0.249518* (1.951)	-0.643585*** (-8.872)	0.807137	F(2. 19) 39.75769	1.62e-07	0.940033
Y 5	28.8523** (2.286)	0.884160** (2.681)	-0.614077 (-1.617)	0.338537	F(2. 19) 4.862096	0.019715	0.819058
Y 5A	11.3584 (1.683)	0.879276** (2.565)		0.247561	F(1. 20) 6.580217	0.018463	0.670904
Y 6	9.27919 (0.9521)	1.88066*** (8.675)	-0.485409 (-1.278)	0.825182	F(2. 19) 44.84227	6.38e-08	1.557818
Y 6A	-2.94765 (-1.548)	1.95650*** (9.238)		0.810143	F(1. 20) 85.34263	1.18e-08	1.423969
Y 7	-14.2812*** (-3.090)	2.06351*** (13.87)	0.918023** (2.194)	0.935951	F(2. 19) 138.8244	4.59e-12	1.549290
Y 8	13.2914 (1.471)	1.42439*** (10.53)	-0.498944 (-1.246)	0.865457	F(2. 19) 61.10914	5.30e-09	0.842949
Y 8A	2.46121 (0.9858)	1.35545*** (10.84)		0.854470	F(1. 20) 117.4283	8.06e-10	1.110231
Y 9	-60.7001* (-1.861)	1.24946*** (4.970)	1.41562* (1.898)	0.590310	F(2. 19) 13.68827	0.000208	0.654092
Y 10	4.24494 (0.1522)	1.04486*** (7.511)	-0.0181425 (-0.1517)	0.787879	35.28566	4.00e-07	0.956509
Y 10A	0.137747 (0.02096)	1.03506*** (8.612)		0.787621	F(1. 20) F(1. 20)	3.66e-08	0.954002
Y 11	392.296 (1.523)	1.07611*** (4.392)	-1.54742 (-1.695)	0.574663	F(2. 19) 12.83524	0.000297	0.232066
Y 11A	-36.5771 (-0.7225)	1.15086*** (4.565)		0.510323	F(1. 20) 20.84324	0.000188	0.337403
Y 12	-245.611*** (-3.225)	1.70851*** (19.87)	0.804666** (2.430)	0.956196	F(2. 19) 207.3758	1.24e-13	0.862775
Y 13	-185.377** (-2.852)	0.0181354 (0.8573)	1.74431*** (5.177)	0.652553	F(2. 19) 17.84233	0.000043	1.317128
Y 13A	-195.968*** (-3.092)		1.85098*** (5.951)	0.639113	F(1. 20) 35.41901	8.06e-06	1.330217
Y 14	-636.481* (-2.024)	-0.317242 (-1.623)	6.65203** (2.850)	0.492305	F(2. 19) 9.212007	0.001597	0.574333
Y 14 A	-904.669*** (-3.250)		8.32283*** (3.820)	0.421882	F(1. 20) 14.59503	0.001070	0.780878
Y 15	52.4813* (1.879)	1.07833*** (3.050)	-1.05627 (-1.689)	0.337398	F(2. 19) 4.837410	0.020040	0.314614

Table 1
Continued

1	2	3	4	5	6	7	8
Y 15A	7.91843 (0.8288)	0.858449** (2.499)		0.237939	F(1. 20) 6.244626	0.021282	0.156938
Y 16	150.365 (0.7136)	-0.157829 (-0.2071)	-0.789423 (-0.2737)	0.004069	F(2. 19) 0.038812	0.962007	0.049739
Y 16A	117.923 (0.8573)		-0.428023 (-0.1910)	0.001820	F(1. 20) 0.036469	0.850475	0.047802
Y 16B	93.8072** (2.333)	-0.0316839 (-0.05347)		0.000143	F(1. 20) 0.957890	0.957890	0.048918
Y 17	152.255 (1.140)	0.638590*** (4.097)	-0.362199 (-1.119)	0.574541	F(2. 19) 12.82884	0.000298	0.553033
Y 17A	3.43298 (0.2884)	0.707464*** (4.909)		0.546502	F(1. 20) 24.10166	0.000085	0.383409

Note: 1.(t-stat); 2. * p < 0.05; ** p < 0.01; *** p < 0.001

Y1 – Cereals and cereal legumes, Y 2 – Raw cotton, Y 3 – Sugar been (processing), Y 4 – Tobacco, Y 5 – Green tea leaf, Y 6 – Potato, Y 7 – Vegetable (in open area), Y 8 – Melons, Y 9 – Fruit and berry, Y 10 – Grapes, Y 11 – Cattle, Y 12 – Sheep and goat, Y 13 – Pig, Y 14 – Poultry, Y 15 – Milk, Y 16 – Egg (thousand pieces), Y 17 – Wool

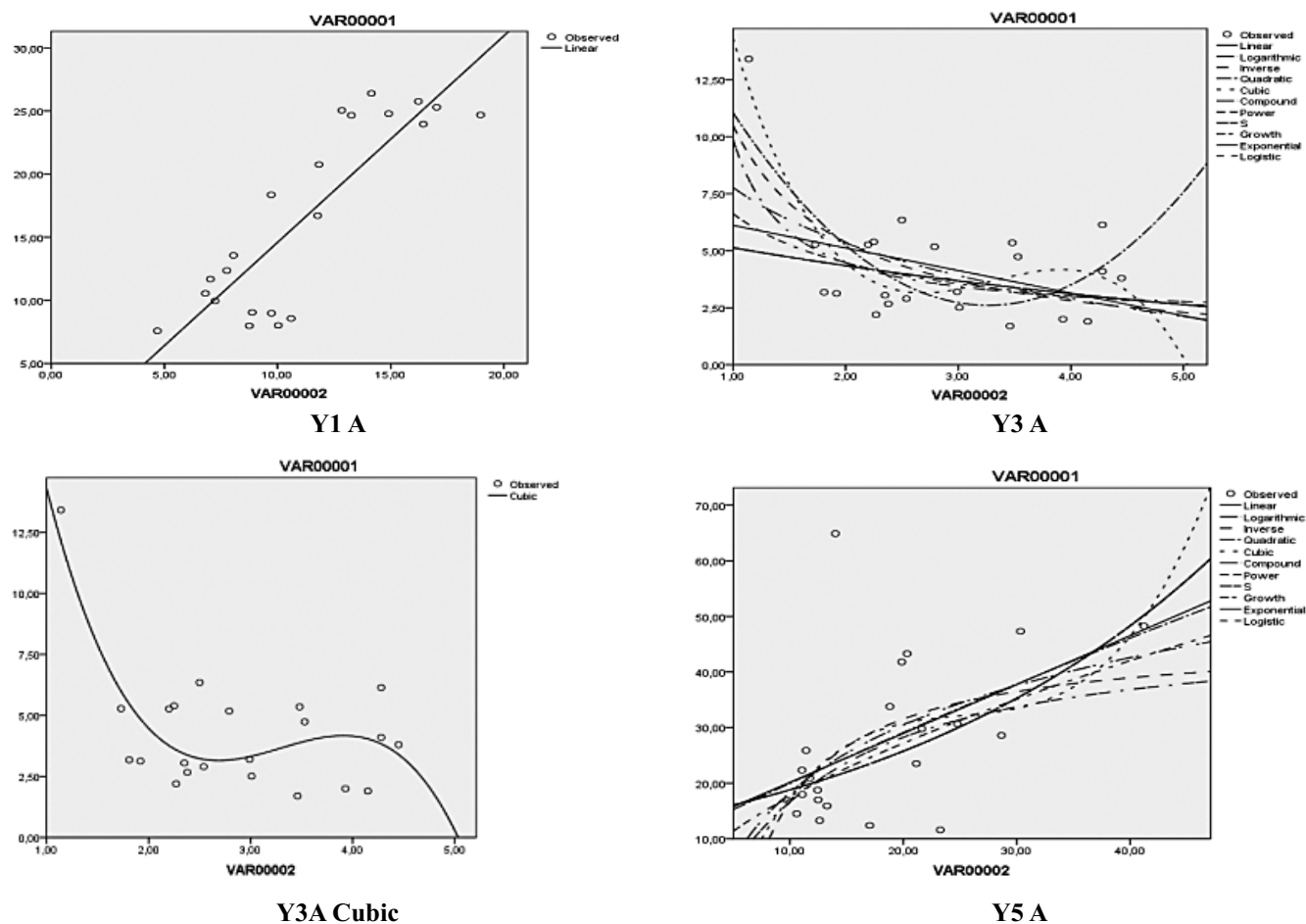
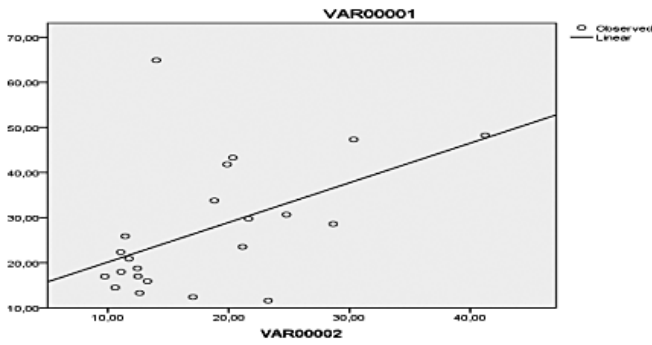
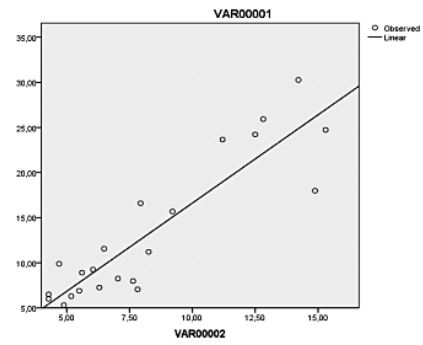


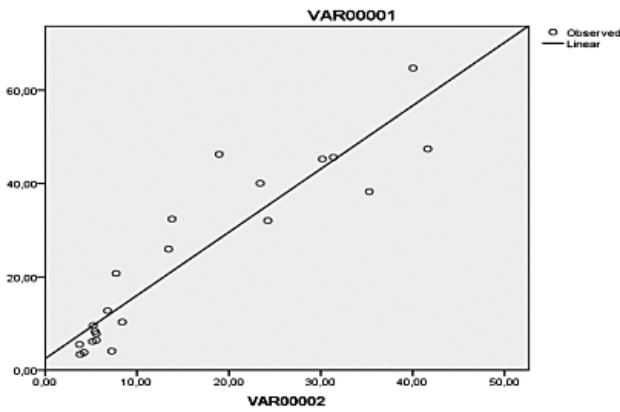
Fig. 1. Econometric Analysis



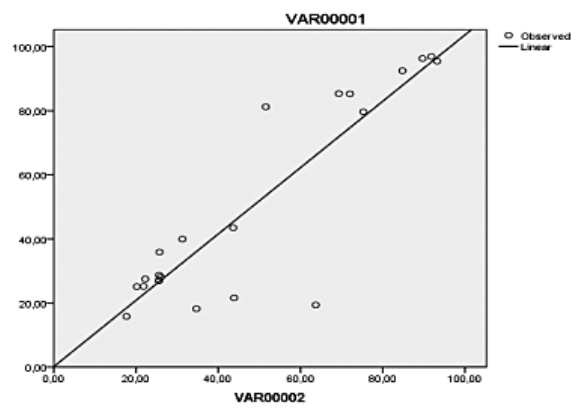
Y5ALinear



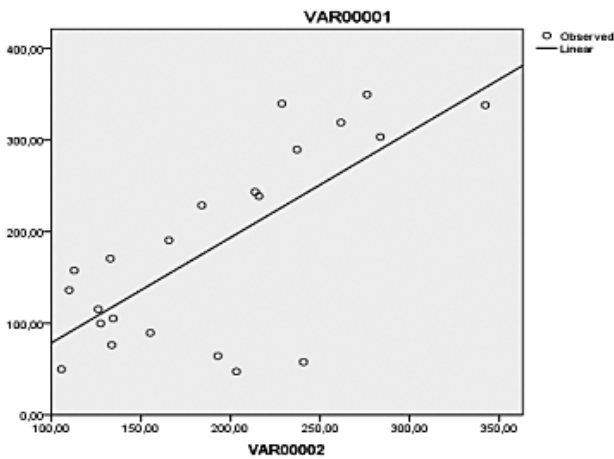
Y6ALinear



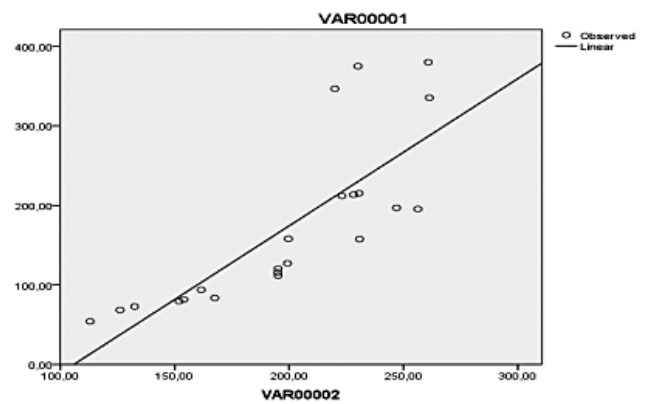
Y8ALinear



Y10ALinear



Y11ALinear



Y13A

Fig. 1. Continued

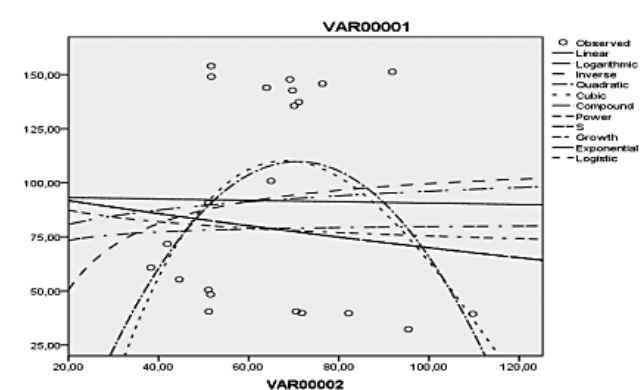
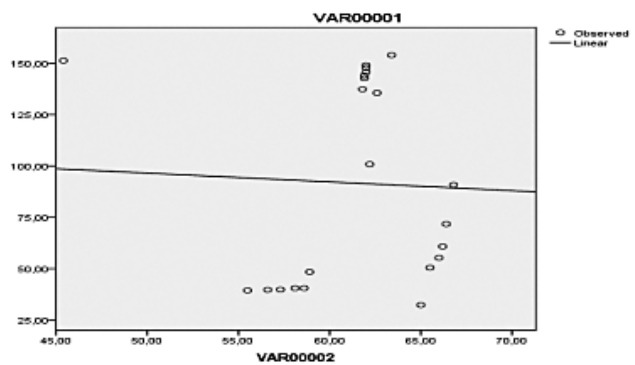
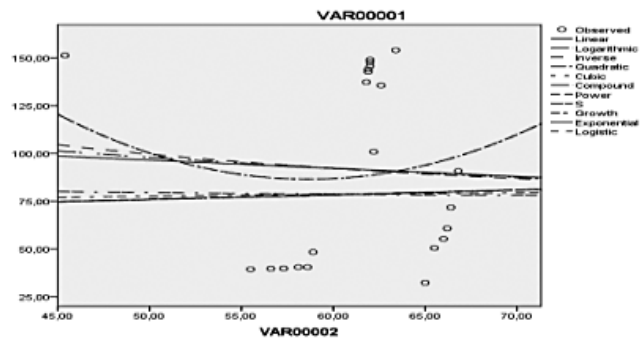
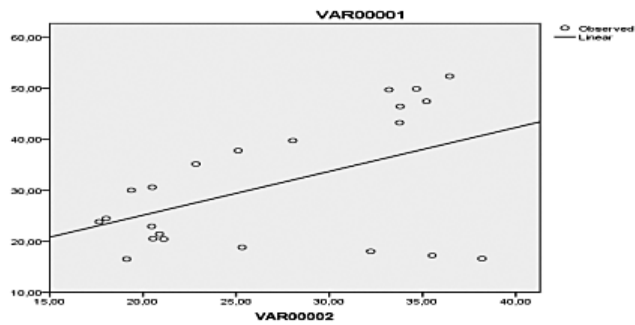
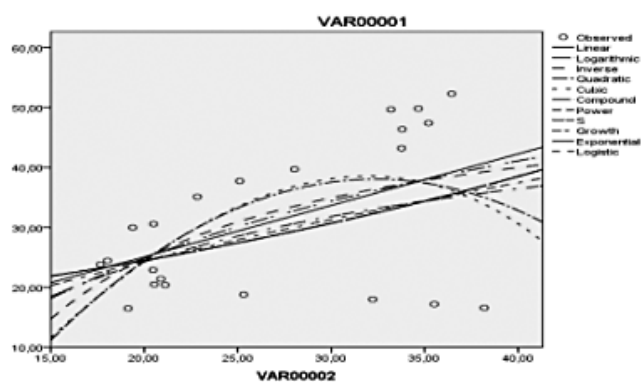
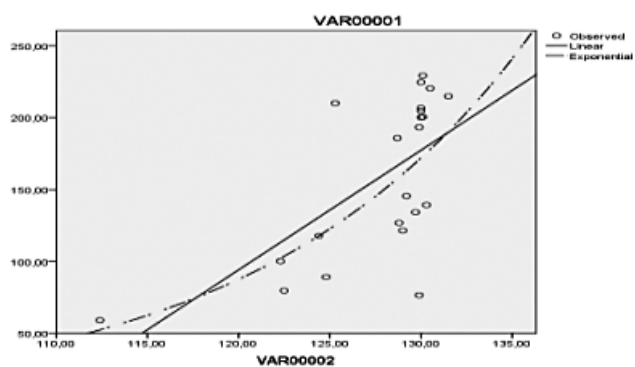
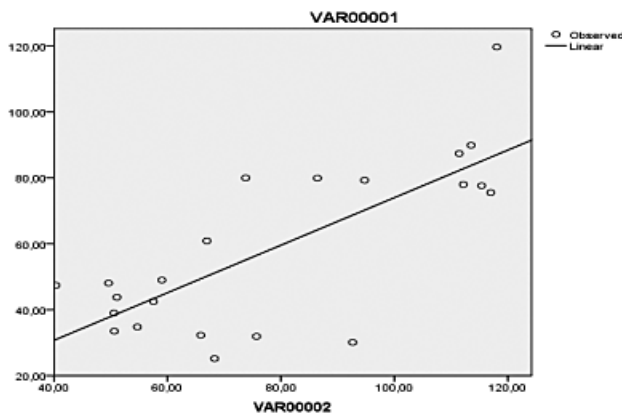


Fig. 1. Continued



Y17B Linear.

Fig. 1. Continued

Due to obtained models one can say that in models reflecting dependent of price of cereal and cereal legumes, raw cotton, tobacco, potato, vegetable (in open area), melons, fruit and berries, grape, cattle, sheep and goat, pork and wool on prime cost and labor cost is $R^2 > 0.5$. However in models reflecting the dependent of price of sugar been (processing), green tea leaf, poultry, milk, egg (one thousand pieces) on prime cost and labor cost is $R^2 < 0.5$. There is no connection price of egg with prime cost and labor cost. In models reflecting dependence of price of raw cotton, tobacco, vegetable (open area), fruit and berries, sheep and goat on prime cost and labor cost coefficient of both factors has statistical significance. It is introduced dependent of price of cereals and cereal legumes, sugar been (processing), green tea leaf, potato, melons, grapes, cattle, milk on only prime cost in other models. It is shown dependence of price of pork, poultry on labor cost. In addition, in models reflecting dependence of price of cereals and cereal legumes, raw cotton, tobacco, green tea leaf, potato, vegetable (in open area), melons, fruit and berries, grapes, cattle, sheep and goat, pig and wool on prime cost is given in linear equation. Dependence of price of sugar been (processing) on prime cost and labor cost is introduced in better cub dependent equation. However it is not defined dependence of price of egg (one thousand pieces) on its prime cost and labor cost.

Discussion and Conclusion

Gain rates of prime cost, labor cost and selling price for one center of agricultural product. Quality and safety of product manufactured in Azerbaijan in increase of competitiveness of agrarian sector must meet international standard. However increase of such competitiveness is due to other factors, competitiveness of price of product, prime cost and labor cost. In other

words it shouldn't be more expensive than world markets.

It is obvious from the research, though gain rate of prime cost agrarian product during 2000-2016 periods increased by 165.5%, selling price 3.1 times labor cost remained unchangeable. Though gain rate of prime cost of agrarian product during 2000-2016 periods increased by 3.4 times, selling price 2.1 times labor cost decreased by 0.1%. We can come to conclusion that result of econometric analysis is true. Connection of labor cost with price is very slight. Consequently, it is worthy to think about decrease of price of prime cost and selling price of product in order to increase competitiveness of product. For this purpose we can use perfection of structure of prime cost of product.

References

- Agbonifoh, B., Ogwo, E., Nnolim, D. and Nkamnebe, A., 1998. Marketing in Nigeria: Concept, Principles and Decisions. 1st ed., Afritower Limited Publisher, Aba, Nigeria. *African Journal of Business Management*, 2 (12), December 2008. <http://www.academicjournals.org/journal/AJBM/article-full-text-pdf/80AA2DA17418>
- Agriculture Canada, 1991. Task Force on Competitiveness in the Agri-Food Industry. Growing Together: Report to Ministers of Agriculture. Agriculture Canada, Ottawa, June.
- Agwu, M.E and A.L. Carter, 2014. Mobile phone banking in Nigeria: benefits, problems and prospects. *International Journal of Business and Commerce*, 3 (6): 50-70. <https://pdfs.semanticscholar.org/3718/f4744e0c2869eba078b0b6e7df297da81e38.pdf>.
- Ahearn, M., D. Culver and R. Schoney, 1990. Usefulness and limitations of COP estimates for evaluating international competitiveness: a comparison of Canadian and U.S. wheat. *American Journal of Agricultural Economics*, 72 (5): 1283-1291.
- Baker, N.L. and R.A. Haugen, 1996. Commonality in the determinants of expected stock returns. *Journal of Financial Economics*, 41: 401-439. <http://www.quantitativeinvestment.com/documents/common.pdf>.
- Ball, E., J.-P. Butault, S.J. Mesonada and C.R. Mora, 2006. Productivity and international competitiveness of European Union and United States agriculture (1973-2002), paper presented at the AIEA2 International Meeting „Competitiveness in Agriculture and the Food Industry: United States and EU perspectives“, Bologna, *Agricultural Economics*, 41 (6): 611-627. https://e-archivo.uc3m.es/bitstream/handle/10016/15898/productivity_sanjuan_AE_2010_ps.pdf?jsessionid=C97A69082D41D9313617B45A425DB5EC?sequence=1
- Banterle, A. and L. Carraresi, 2007. Competitive performance analysis and European Union trade: The case of the prepared swine meat sector. *Food Economics – ActaAgricScand C*, 4: 159-172. <https://ageconsearch.umn.edu/bitstream/10058/1/sp06ba11.pdf>.
- Barkema, A., M. Drabenstott and L. Tweeten. It's Competitiveness of U.S. Agriculture in the 1990s in Agricultural Policies. In the 1990s in Agricultural Policies in the New Decade, Kristen Allen (ed.), Resources for the Future, *National Planning Association*.
- Bavorova, M. 2003. Influence of policy measures on the competitive-

- ness of the sugar industry in the Czech Republic. *Agricultural Economics – Czech*, **49** (6): 266-274.
<http://www.agriculturejournals.cz/publicFiles/59373.pdf>.
- Bedlin, L., C.O. Senff, C. Kudlawicz-Franco, A. Souza, C.P. Da Veiga and L.C. Duclós**, 2016. Agribusiness management of *Phytolacca peruviana* L. fruit in Brazil. *Bulg. J. Agric. Sci.*, **22**: 691-704.
<http://www.agrojournal.org/22/05-01.pdf>.
- Bojnec, S. and I. Fertő**, 2009. Agro-food trade competitiveness of Central European and Balkan countries. *Food Policy*, vol. **34**: pp. 417-425.
http://ageconsearch.umn.edu/bitstream/134888/2/3_Former.pdf.
- Carraresi, L. and A. Banterle**, 2008. Measuring competitiveness in the EU market: a comparison between food industry and agriculture, paper presented at the 12th EAAE Congress, Gent, Belgium, 27-30 August.
<https://ageconsearch.umn.edu/bitstream/43692/2/187.pdf>.
- Celik, Y. and K. Peker**, 2009. Benefit/cost analysis of mushroom production for diversification of income in developing countries. *Bulg. J. Agric. Sci.*, **15**: 228-237.
<http://www.agrojournal.org/15/03-07-09.pdf>.
- Cesaro, L., S. Marongiu, F. Arfini, M. Donati and M. Capelli**, 2008. Cost of Production: Definition and Concept, deliverable 1.1.2, FP7 project FACEPA „Farm Accountancy Cost Estimation and Policy Analysis of European Agriculture“, October.
http://facepa.slu.se/documents/Deliverable_D1-1-2_LEI.pdf
- Courville, T. and B. Thompson**, 2001. Use of structure coefficients in published multiple regression articles: is not enough. *Educ. Psychol. Meas.*, **61** (2): 229-248.
 CrossRef Full Text ([dx.doi.org/10.1177/00131640121971211](https://doi.org/10.1177/00131640121971211))
www.researchgate.net/profile/Bruce_Thompson12/publication/238069002_Use_of_Structure_Coefficients_in_Published_Multiple_Regression_Articles_B_Is_Not_Enough/links/5540e6970cf2718618dc24f9/Use-of-Structure-Coefficients-in-Published-Multiple-Regression-Articles-B-Is-Not-Enough.pdf
- Drescher, K. and O. Maurer**, 1999. Competitiveness of the European dairy industries. *Agribusiness*, **15** (2): 163-177.
- Erdal, H., G. Erdal and K. Esengun**, 2009. An analysis of production and price relationship for potato in Turkey: a distributed lag model application. *Bulg. J. Agric. Sci.*, **15**: 243-250.
<http://www.agrojournal.org/15/03-09-09.pdf>.
- Ezeudu, I.J.**, 2005. Principles of Marketing, *Cecta Nigeria Limited*, Enugu, Nigeria.
- Fields, G.**, 2004. Dualism in the labor market: a perspective on the Lewis model after half a century. *The Manchester School*, **72** (6): 724-735.
<http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1270&context=articles>.
- Friedman, D.D.**, 1990. Price Theory: An Intermediate Text, *Southern Prestige Publishing Co*
https://cobe.boisestate.edu/ireynold/WEB/Intermediate/PRICE%20THEORY_%20Friedman_text.pdf.
- Gallagher, P., G. Schamel, H. Shapouri and H. Brubaker**, 2006. The international competitiveness of the U.S. corn-ethanol industry: A comparison with sugar-ethanol processing in Brazil. *Agribusiness*, **22** (1): 109-134.
http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1441&context=econ_las_pubs.
- Gorton, M. and S. Davidova**, 2001. The international competitiveness of CEEC agriculture. *World Economy*, **24** (2): 185-200.
<https://www.staff.ncl.ac.uk/matthew.gorton/baseses2001.pdf>.
- Gorton, M., S. Davidova and T. Ratinger**, 2000. The competitiveness of agriculture in Bulgaria and the Czech Republic vis-à-vis the European Union. *Comparative Economic Studies*, **42** (1): 59-86.
<http://www.freepatentsonline.com/article/Comparative-Economic-Studies/62216453.html>
- Haggblade, S. and P. Hazell**, 1989. Agricultural Technology and Farm-nonfarm Growth Linkages. *Agricultural Economics*, vol. **3**: 345-364.
<http://ageconsearch.umn.edu/bitstream/172352/2/agec1989v003i004a009.pdf>.
- Haggblade, S., J. Hammer and P. Hazell**, 1991. Modeling agricultural growth multipliers. *American Journal of Agricultural Economics*, **73** (2): 361-374.
- Hazell, P. and J. Thurlow**, 2007. The Role of Agriculture in Development: Implications for Sub-Saharan Africa. Research Report 153. *International Food Policy Research Institute*.
<http://ageconsearch.umn.edu/bitstream/55405/2/dsgdp29.pdf>.
- Hazell, P.B.R. and A. Röell**, 1983. Rural Growth Linkages: Household Expenditure Patterns in Malaysia and Nigeria. *Intl Food Policy Res Inst*, Washington D.C.
http://pdf.usaid.gov/pdf_docs/PNAA887.pdf.
- Henson, R.K.**, 2002. The logic and interpretation of structure coefficients in multivariate general linear model analyses. Paper Presented at the Annual Meeting of the American Educational Research Association, New Orleans.
<https://files.eric.ed.gov/fulltext/ED467381.pdf>.
- Henson, R.K., D.M. Hull and C. Williams**, 2010. Methodology in our education research culture: toward a stronger collective quantitative proficiency. *Educational Researcher*, Vol. **39**, No. 3, pp.229-240.
<http://journals.sagepub.com/doi/pdf/10.3102/0013189X10365102>
- Jambor, A. and A. Gibba**, 2017. Competitiveness in global agri-food trade: The case of peanuts. *Bulg. J. Agric. Sci.*, **23** (2): 177-182.
<http://www.agrojournal.org/23/02-01.pdf>.
- Johnston, B.F. and J.W. Mellor**, 1961. The role of agriculture in economic development. *The American Economic Review*, **51**(4): 566-593.
- Johnson, G.**, 1997. Agriculture and the wealth of nations. *The American Economic Review*, **87** (2) pp. 1-12.
- Keskin, G., F. Fusun Tatlidil and I. Dellal**, 2010. An analysis of tomato production cost and labor force productivity in Turkey. *Bulg. J. Agric. Sci.*, **15**: 692-699.
<http://www.agrojournal.org/16/06-05-10.pdf>.
- Kizilaslan, H., H. Ebru Onurlubas and N. Yilmaz**, 2011. Development direction of stockbreeding sector in Turkey (Tokat city example). *Bulg. J. Agric. Sci.*, **17**: 195-206.
<http://www.agrojournal.org/17/02-10-11.pdf>.
- Kotler, P., G. Armstrong, V. Wong and J. Saunders**, 2001. Principles of Marketing, Harlow, United Kingdom.
<http://s1.downloadmienphi.net/file/downloadfile8/148/1372857.pdf>.
- Landau, R.**, 1992. Technology, capital formation and U.S. competitiveness. In: International Productivity and Competitiveness, Hickman, B.G. (éd.). *Oxford University Press*, New York. pp. 299-325.

- [http://dx.b-ok.org/genesis/511000/a91f651210af44bb8acf-021250c3cad9/_as/\[Bert_G._Hickman\]_International_Productivity_and_C\(b-ok.org\).pdf](http://dx.b-ok.org/genesis/511000/a91f651210af44bb8acf-021250c3cad9/_as/[Bert_G._Hickman]_International_Productivity_and_C(b-ok.org).pdf).
- Lewis, W.**, 1954. Economic development with unlimited supplies of labour. *The Manchester School*, **22** (2) pp. 139-191.
<http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9957.1954.tb00021.x/epdf>.
- Lopes, B.F.R. and A.L.R. de Oliveira**, 2017. The supply chain of Brazilian maize: application of a partial equilibrium model. *Bulg. J. Agric. Sci.*, **23** (5): 717-772
<http://www.agrojournal.org/23/05-05.pdf>.
- Mulder, N., A. Vialou, B. David, M. Rodriguez and M. Castilho**, 2004. La Compétitivité de l'Agriculture et des Industries Agroalimentaires dans le Mercosur et l'Union Européenne dans une Perspective de Libéralisation Commerciale, Working Paper/ Document de travail N°2004- 19, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII), Paris, France, November.
http://www.cepii.fr/PDF_PUB/wp/2004/wp2004-19.pdf.
- Nimon, K., R. Henson and M. Gates**, 2010. Revisiting interpretation of canonical correlation analysis: a tutorial and demonstration of canonical commonality analysis. *Multivariate Behav. Res.*, **45**: 702-724.
CrossRef Full Text <http://dx.doi.org/10.1080/00273171.2010.498293>.
- Nivievskiy, O. and S. von Cramon-Taubadel**, 2008. The determinants of dairy farming competitiveness in Ukraine, paper presented at the 12th EAAE Congress, Gent, Belgium, 27-30 August.
<http://ageconsearch.umn.edu/bitstream/44059/2/329.pdf>.
- Osborne, J. and E. Waters**, 2002. Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research & Evaluation*, **8** (2).
<http://pareonline.net/Getvn.asp?V=8&N=2> Available at: <http://PAREonline.net/getvn.asp?>
- Oxouzi, E., K. Melfou, M. Galea and E. Papanagiotou**, 2012. Economic performance and crop farm efficiency in mountainous and other less favored areas in Greece. *Bulg. J. Agric. Sci.*, **18**: 846-853.
<http://www.agrojournal.org/18/06-05-12.pdf>.
- Pedhazur, E.J.**, 1997. Multiple Regression in Behavioral Research: Explanation and Prediction, 3rd Edn. Fort Worth, TX: *Harcourt Brace*.
<https://www.01074d0e0ca64dd52127d542d631eeff0-original.pdf>.
- Porter, M.**, 1990. The Competitive Advantage of Nations, *Free Press, McMillan*, New York.
<https://www.clustermapping.us/sites/default/files/files/resource/The%20Competitive%20Advantage%20of%20Nations%20HBR.pdf>.
- Qineti, A., M. Rajcaniova and E. Matejkova**, 2009. The competitiveness and comparative advantage of the Slovak and the EU agri-food trade with Russia and Ukraine. *Agricultural Economics – Czech*, **55** (8): 375-383.
<http://www.agriculturejournals.cz/publicFiles/09422.pdf>.
- Sabkov, H., E. Vidinova, E. Raycheva and T. Ivanova**, 2016. Influence of the modular approach on the production costs during introduction of ewes' machine milking. *Bulg. J. Agric. Sci.*, **22**: 158-164.
<http://www.agrojournal.org/22/01-27.pdf>.
- Schewe, C.D.**, 1987. Marketing, Principles and Strategies. *London House, Inc.*, New York.
- Schultz, T.**, 1964. Transforming Traditional Agriculture. *Yale University Press*, New Haven.
- Sharples, J.**, 1990. Cost of production and productivity in analyzing trade and competitiveness. *American Journal of Agricultural Economics*, **72** (5): 1278-1282.
- Sharples, J. and N. Milham**. 1990. Longrun Competitiveness of Australian Agriculture. *Foreign Ag Econ Report*, No. 243, ERS/USDA, December 1990.
<https://ageconsearch.umn.edu/record/147996/files/faer243.pdf>.
- Stanton, W.J.**, 1981. Fundamentals of Marketing; 6th ed., *McGraw Hills Inc.*, USA.
- Stevens, J.P.**, 2009. Applied Multivariate Statistics for the Social Sciences, 4th ed. New York: *Routledge*.
- Stoykova, M. and L-J. Asheim**, 2011. Comparing Bulgarian and Norwegian agriculture with emphasis on experience's lessons. *Bulg. J. Agric. Sci.*, **17**: 368-377.
<http://www.agrojournal.org/17/03-13-11.pdf>.
- Tellis, G.J.**, 1986. Beyond the many faces of price: an integration of pricing strategies; *The Journal of Marketing*, **50** (4): 146-160.
<http://www-bcf.usc.edu/~tellis/faces.pdf>.
- Thompson, B.**, 2006. Foundations of Behavioral Statistics: An Insight Based Approach. New York: *Guilford Press*.
- Thorne, F.**, 2005. Analysis of the competitiveness of cereal production in selected EU countries, paper presented at the 11th EAAE Congress, Copenhagen, Denmark, 24-27 August.
<https://ageconsearch.umn.edu/record/24613/files/pp05th01.pdf>.
- Toming, K.**, 2007. The impact of EU accession on the export competitiveness of Estonian food processing industry. *Post-Communist Economies*, **19** (2): 187-207.
http://dspace.ut.ee/bitstream/handle/10062/17457/toming_kristina.pdf?sequence=3&isAllowed=y
- Van Berkum, S.**, 2009. An Assessment of the Competitiveness of the Dairy Supply Chain in New Member States, Candidate Countries and Potential Candidate Countries, final report, AgriPolicy, May.
http://www.agro-polis.eu/agroimages/ANASSESS_MEN-TOFTHETCOMPETITIVENESSOFTHEDAIRYSUPPLYCHAIN_F22482.pdf.
- Venturini, L. and S. Boccaletti**, 1998. Sophisticated consumers and export success, but problems in the home retail sector: The Italian pasta industry, In: Traill, B., Pitts, E. (eds), Competitiveness in the Food Industry, Chapter 6, *Blackie Academic & Professional*, London, pp. 179-208.
- Wijnands, J., H. Bremmers, B. van der Meulen and K. Poppe**, 2008. An economic and legal assessment of the EU food industry's competitiveness. *Agribusiness*, **24** (4): 417-439.
- Zientek, L.R. and B. Thompson**, 2009. Matrix summaries improve research reports: secondary analyses using published literature. *Educ. Res.*, **38**: 343-352.
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.919.64&rep=rep1&type=pdf>.