

THE USE OF ECONOMIC RETRO RESEARCH FOR THE METHODOLOGICAL PROVISION OF CAPITALIZATION OF ENTERPRISES

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Abstract. The purpose of the article is to determine indicators that objectively allow attracting own or debt sources for capital expansion of enterprises. Dynamic development of the agro-processing sector of the economy of Ukraine is considered on the basis of interaction of agricultural and processing complexes of Mykolaiv region of Ukraine. *Methodology.* Determining indicators of formation and use of capital of enterprises is carried out after studying analytical support for the factor evaluation of market trends in the production of processing enterprises of AIC (agro-industrial complex) of Mykolaiv region that has developed processing industry and is based on studies of the period from 2005 to 2009 when a situation regarding the provision of processing enterprises significantly improved but, much as today, the state of business in relation to animal products was ambiguous. *Results* of the research show that it was expedient to conduct a trend analysis, which purpose is comparison of the volume of agricultural products sold to processing enterprises and the production of core products by processing enterprises, determination of the main trend of dynamics of selected indicators by means of comparing each of positions in the period of 2005–2009. This allowed finding indicators for determining the requisite capital of enterprises. *Practical implications.* Substantiation of the financial restructuring of the capital of enterprises of AIC enables their further development in terms of European integration and will ensure the attractiveness of investing in the agricultural complex of Ukraine. *Value/originality.* The authors formed an approach to identifying a need for a capital of processing enterprises based on developed economic models and analytical support for the factor evaluation of production market trends that made provisions for prerequisites for adequate determination of the potential of processing enterprises of AIC.

Key words: processing enterprises of agro-industrial complex, factor evaluation of production market trends, financial restructuring of capital.

JEL Classification: Q12, O21, G32

1. Introduction

Capital formation process is one of the prerequisites of functioning and conducting production activity, creating attractive investment image, ensuring firmness of modern domestic enterprises and successful realization of possibilities of their development in the long run, which defines necessity of identifying indicators of activity that determine the formation and rational use of enterprise capital. Limiting possibilities of enterprises in relation to production, capital due to its mobility contributes to solving such economic tasks as: a combination of production and product demand; innovative development of production activity; reducing and cheapening costs of production and services.

In 2017, Ukraine sold agricultural products in the amount of 17.9 billion USD (2016 – 15.5 billion). In a total volume of foreign trade in agricultural and food products, the share of export is 79.4%. The most exported are grain crops – 36.2%, vegetable oil – 25.1%, and oil seeds – 11.3%. Supplies of Ukrainian processed and food products considerably increased for the 2017 year. However, the export of crop production (mainly raw materials) increased by 2.1 billion USD and was 16.7 billion USD. More important for the economy export of animal products grew by 371.4 million USD and reached about 1.3 billion USD [[/zn.ua/ECONOMICS/6](http://zn.ua/ECONOMICS/6)]. Thus, the need for capital is growing and requires using developed and proven methodological approaches to its formation and use.

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2. The modern use of economic retro research

Processing chain of the agro-industrial sector has the most efficient ties with agricultural enterprises, which are based on the organizational-economic unity of production, storage, and processing of products.

Analytical support for the factor evaluation of production market trends of processing enterprises of AIC of Mykolaiv region characterised by developed processing industry is

based on research of the period from 2005 to 2009 when a situation regarding the provision of processing enterprises significantly improved but, much as today, the state of business in relation to animal products was ambiguous since the volume of sales of cattle and poultry increased but of milk and eggs – decreased.

Analysing production volumes of core products of processing enterprises of AIC of Mykolaiv region for

Table 1

Production of core products by processing enterprises of AIC of Mykolaiv region for 2005–2009, tons

Production	2005	2006	2007	2008	2009
Fresh (fresh-killed) or chilled beef and veal	789	1001	659	421	391
Fresh (fresh-killed) or chilled pork	730	786	1030	774	945
Fresh or chilled meat and edible offal of poultry	86	58	31	13	6
Dried, salt or smoked pork	183	447	606	641	381
Salt, in brine, dried or smoked poultry meat	37	141	201	235	190
Sausage products	2620	3066	3142	3542	2607
Semi-finished meat products (including poultry meat)	65	146	641	6139	540
Smoked fish, including fillets	130	132	136	140	53
Dried or salt fish except for fish fillets	225	213	154	120	81
Fruit and vegetable juice, nectars	240648	289566	489781	463205	348625
Juice for children	61308	74408	5947	4013	4288
Natural canned vegetables	15861	19865	12637	19265	28678
Unrefined sunflower oil	29822	59748	59618	25421	69094
Processed fluid milk	15681	15053	15406	14856	9760
Cream with fat content more than 8%	22	99	152	150	63
Butter	3541	3658	3752	3931	2599
Fat blends and spread products	2623	1813	3280	3460	3156
Fresh unfermented cheese and sour milk cheese	16487	17616	18212	16784	15509
Fat cheeses	10038	8760	10410	12286	11644
Milk and cream condensed with sugar or without sugar or other sweetening matter	13735	9781	12150	10152	13381
Fermented milk products	24365	25812	27947	27794	20983
Flour	84257	81049	93681	83576	71332
Groats	6061	2704	1385	1181	1686
Prepared feed for cattle and poultry	49638	33479	31673	26388	30240
Bakery products	51948	47208	44755	42690	37801
Viennoiseries	1273	1103	1069	774	789
Pryaniki and related products, sweet cookies; waffles	2100	2330	2877	2227	1221
Noodles, not stuffed, not heat-treated or prepared in any other way	1140	886	610	599	515
Grape wine, ths. dal	2213	2581	3059	3493	2822,8
Natural non-carbonated mineral waters, ths. dal	11,4	43,3	95,2	71,7	96,4
Natural carbonated mineral waters, ths. dal	839,1	837,9	1333	1360,5	1337,1
Soft drinks, ths. dal	1763,4	1320,8	1851,3	2414,2	2994

Table 2

Indicators of primary production for processing enterprises of AIC of Mykolaiv region for 2005–2009, thousand tons

Indicator	2005	2006	2007	2008	2009
Gross collection of grain and leguminous crops in all types of households (in weight after completion)	1763,4	1950,6	640,9	2385,9	2465,1
Gross collection of sugar beets (industrial) in all types of households	145,5	283,0	53,1	14,3	12,67
Gross collection of sunflower seeds in all types of households (in weight after completion)	426,8	499,2	259,7	517,3	553,1
Gross collection of vegetables in all types of households	266,7	297,2	151,6	274,4	334,2
Meat production in all types of households (live weight)	44,8	44,4	50,7	46,0	39,9
Milk production in all types of households	432,3	413,1	379,2	368,8	367,7
Egg production in all types of households, mln. pcs	313,7	327,0	336,7	386,3	473,9

2005–2009, decline of production of meat packing factories and fish canneries should be noted, which is caused by lack of raw materials in the sector, high credit interest rates for considerable raw material base recovery, low demand for products over the non-creditworthiness of the population and high price for products.

Indicators of primary production for processing enterprises of AIC of Mykolaiv region for 2005–2009 are presented in Table 2.

During 2005–2009, volumes of a gross collection of grain crops by all categories of farms of Mykolaiv region are increasing that is also peculiar to the present time, however, reduction of cattle and cow population in all types of households is also observed.

3. A methodological approach to determining indicators of the enterprise capital formation

In order to find results of the analysis of supply of processing enterprises of Mykolaiv region, a trend analysis is conducted, which purpose is to compare volumes of agricultural products sold to processing enterprises and production of core products by processing enterprises, determine the main trend of dynamics of selected indicators by means of comparing each of positions in the period of 2005–2009.

Table 3

Data on dynamics of volumes of agricultural products sold to processing enterprises of Mykolaiv region for 2005–2009

Year	Volume of agricultural products sold to processing enterprises of Mykolaiv region, million UAH
2005	2,24
2006	2,44
2007	1,45
2008	3,26
2009	2,65

During the analysed period, there is observed a tendency for increasing volumes of agricultural products sold to processing enterprises of Mykolaiv region. The exception is a decrease in the indicator in 2007; the value was 1.45 million UAH, which is determined, on the one hand, by general decline in production under the economic crisis, on the other, by low level of capital concentration, which makes it impossible to increase the volume of purchases of raw materials from manufacturing enterprises. Similar problems are also taking place in processing enterprises of AIC today. Thus, directions obtained that point at a need for enterprises' capital expansion can be used in modern practice.

Adjustment of time series is carried out by a right line described by a trend equation as a function:

$$Y_t = a_0 + a_1 t \quad (1)$$

where a_0 , a_1 – parameters of trend equation; t – sequence number of time periods.

Table 4

Data on dynamics of production of core products by processing enterprises of AIC in Mykolaiv region for 2005–2009

Year	Production of core products by processing enterprises of AIC in Mykolaiv region, million UAH
2005	2,16
2006	2,67
2007	3,51
2008	4,35
2009	4,37

We determine trend equation parameters a_0 and a_1 from the system of equations:

$$\begin{cases} a_0 n + a_1 \sum_{i=1}^n t_i = \sum_{i=1}^n y_i \\ a_0 \sum_{i=1}^n t_i + a_1 \sum_{i=1}^n t_i^2 = \sum_{i=1}^n y_i t_i \end{cases} \quad (2)$$

Estimated data for analytical adjustment of time series of production of core products by processing enterprises of AIC in Mykolaiv region, we determined by the linear trend (Table 5).

Table 5

Estimated data for analytical adjustment of time series of volumes of agricultural products sold to processing enterprises of Mykolaiv region

Year	Volumes of agricultural products sold to processing enterprises of Mykolaiv region, y	Conditional sign of time, t	t^2	$y \cdot t$	$y = a_0 + a_1 t$
2005	2,24	1	1	2,24	3,09
2006	2,44	2	4	4,88	6,18
2007	1,45	3	9	4,35	9,27
2008	3,26	4	16	13,04	12,36
2009	2,65	5	25	13,25	15,45
Σ	12,04	15	55	37,76	46,35

We obtain the following trend equation parameters for volumes of agricultural products sold to processing enterprises of Mykolaiv region:

$$a_0 = \frac{\sum_{i=1}^n y_i}{n} = \frac{46,3}{5} = 9,27 \quad (3)$$

$$a_1 = \frac{\sum_{i=1}^n y_i t_i}{\sum_{i=1}^n t_i^2} = \frac{37,76}{55} = 0,69 \quad (4)$$

For the indicator of volumes of agricultural products sold to processing enterprises of Mykolaiv region, trend equation is the following:

$$y = 9,27 + 0,69t$$

According to the computational table, the sum of time series is equal to the sum of time series calculated on the

basis of analytical adjustment, which indicates that the smoothing of a time series is performed correctly.

Table 6

Estimated data for analytical adjustment of time series of production of core products by processing enterprises of AIC in Mykolaiv region

Year	Production of core products by processing enterprises of AIC in Mykolaiv region, y	Conditional sign of time, t	t^2	y'	$y = a_0 + a_1t$
2005	2,16	1	1	2,2	4,45
2006	2,67	2	4	5,3	8,90
2007	3,51	3	9	10,5	13,35
2008	4,35	4	16	17,4	17,80
2009	4,37	5	25	21,9	22,25
Σ	17,06	15	55	57,3	66,75

According to formula 3 and 4, we obtain the following parameters of trend equation for the indicator of production of core products by processing enterprises of AIC in Mykolaiv region:

$$a_0 = \frac{17,06}{5} = 3,41$$

$$a_1 = \frac{57,3}{55} = 1,04$$

The trend equation for the production of core products by processing enterprises of AIC in Mykolaiv region is as follows:

$$y = 3,41 + 1,04t$$

We present obtained results in graphic form in Fig. 1. According to findings, the forecast of volumes of

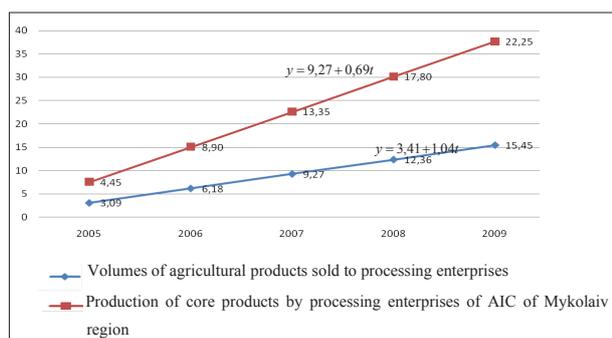


Fig. 1. Results of trend analysis of volumes of agricultural products sold to processing enterprises and production of core products by processing enterprises of Mykolaiv region for 2005–2009

agricultural products sold to processing enterprises and production of core products by processing enterprises of Mykolaiv region for 2010–2019 is made, which will allow grounding on the dynamics of dependence between these indicators.

According to the obtained trend equation for the volumes of agricultural products sold to processing enterprises, the forecast value of the indicator in 2010–2019 will be $Y_{2010}=9,27+0,69x6=18,54$;

$$Y_{2011}=9,27+0,69x7=21,63; Y_{2012}=9,27+0,69x8=24,72; Y_{2013}=9,27+0,69x9=27,81; Y_{2014}=9,27+0,69x10=30,9; Y_{2015}=9,27+0,69x11=33,99; Y_{2016}=9,27+0,69x12=38,07; Y_{2017}=9,27+0,69x13=40,14; Y_{2018}=9,27+0,69x14=43,26; Y_{2019}=9,27+0,69x15=46,35$$

For the production of core products by processing enterprises of AIC –

$$Y_{2010}=3,41+1,04x6=26,7; Y_{2011}=3,41+1,04x7=31,15; Y_{2012}=3,41+1,04x8=35,6; Y_{2013}=3,41+1,04x9=40,05; Y_{2014}=3,41+1,04x10=44,5; Y_{2015}=3,41+1,04x11=48,95; Y_{2016}=3,41+1,04x12=53,4; Y_{2017}=3,41+1,04x13=57,85; Y_{2018}=3,41+1,04x14=62,3; Y_{2019}=3,41+1,04x15=66,75.$$

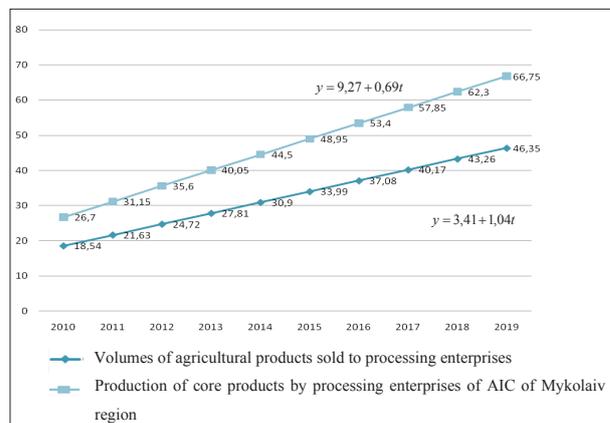


Fig. 2. Forecasted data on volumes of agricultural products sold to processing enterprises and production of core products by processing enterprises of Mykolaiv region for 2010–2019

4. Conclusions

The obtained forecast data allowed asserting about the possibility of growth of production of core products by processing enterprises of AIC of Mykolaiv region during 2010–2019, which took place for 2010–2017 and provides for the possibility of their growth for 2018–2019. The determined benchmarks justify the necessity of financial restructuring of the capital of processing enterprises of AIC of Mykolaiv region for the purpose of its stable growth.

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