

STUDY OF UNPROFITABILITY OF UKRAINE'S LARGE CONSTRUCTION ENTERPRISES BY THE DUPONT METHOD

Katerina Izmailova¹, Yuliia Zapiechna²

Abstract. Profitability and its varieties remain the key indicator, which helps to explore certain dependencies and consequences of economic activity of each enterprise in the country. The authors study large construction companies in Ukraine to identify general trends in the construction sector. Despite their overall small share in the total number of all construction enterprises, one should note their significant contribution to the development of the construction sector of Ukraine and higher profitability compared to small and medium enterprises. The negative trend of large construction companies during 2010–2020 proves the relevance of a detailed analysis of such an indicator as the loss ratio of equity in order to identify the factors that have the greatest negative impact. *Method.* The authors analyse the impact of operating, investment and financial activities on the loss of equity of Ukrainian large construction companies in 2018 compared to 2013 by the widely known method of the company DuPont. It is based on an equation that shows the relationship between return on invested capital, asset turnover, net income and financial leverage. Only in 2018 the situation started to level off. Factor analysis of profitability indicators has revealed the in-depth factors that affect them, namely: loss of the main activity of construction enterprises for ten consecutive years, which caused a decrease in equity to a critically low level and, accordingly, high values of financial leverage. *Results.* The use of the DuPont method for the analysis of profitability (loss) for large construction companies has allowed a deeper analysis of the factors that influenced such indicators as return on equity. It has been found that the profitability (loss) of equity industries are influenced by the rate of business activity and financial dependence of large construction companies. *Practical significance.* It has been found that the loss of equity is influenced by a decrease in uncovered profits and a decrease in financial dependence (the ratio of financial dependence increased from 34.96 in 2013 to – 19.213 in 2018) of large construction companies. This indicates a gradual erosion of equity of construction companies, increasing the level of risk, reducing their financial stability. Additional measures are needed to revive the general economic situation in the country, including the digital transformation of construction, the search for innovative activities, the restructuring of institutional support for the construction sector.

Key words: large construction enterprises, DuPont method, return on equity, profitability of production activity, asset turnover, financial leverage.

JEL Classification: G17, G32, L74

1. Introduction

Current development of the national economy of Ukraine requires special attention to profitability of all types of enterprises.

Since construction is the economy sector that has been operating at a loss for more than ten years (Izmailova, Belenkova, Mogolivets, 2019), the urgent task of the researchers and experts is to identify the reasons to this issue.

To identify general trends in the construction sector the authors study large construction companies in Ukraine. Despite their overall small share in the

total number of all construction enterprises, one should note their significant contribution to the development of the construction sector of Ukraine and higher profitability compared to small and medium enterprises.

One of the most important indicators for assessing the effectiveness of construction companies is their profitability (or loss). The term “profitability” is best described by the word “return”, because profitability indicators show the ratio of profit (or loss) to the level of sales, the amount of assets, and equity of the analysed object.

Corresponding author:

¹ Kyiv National University of Construction and Architecture, Ukraine.

E-mail: staskat@ukr.net

ORCID: <https://orcid.org/0000-0001-8460-110X>

² Kyiv National University of Construction and Architecture, Ukraine.

E-mail: july81@i.ua

ORCID: <https://orcid.org/0000-0003-3333-9900>

It should be noted that common causes of unsatisfactory financial condition of large construction companies and the ways to improve it have been identified in the recent works by Goiko A. F. (Goiko, 2008), Izmailova K. V. (Izmailova, 2005), Sorokina L. V. (Sorokina, 2017), Stetsenko S. P. (Stetsenko, Belenkov, Antropov, 2018), Krush P. V. (Krush, 2008), Bielienskova O. Yu. (Bielienskova, 2005; Bielienskova, 2010; Izmailova, Belenkova, Mogolivets, 2019).

Nevertheless, the negative trend of large construction companies during 2010–2018 proves the relevance of a detailed analysis of the general indicator – the loss of equity to identify the factors that have the greatest negative impact.

2. Large construction companies in Ukraine

The dynamics of the number of large construction companies in Ukraine during 2010–2018 is shown in Figure 1 (State Statistics Service of Ukraine).

The number of large construction companies in 2018 decreases by 2.17 times in comparison with 2013. However, if you look at recent years, in 2018 there was a 3-fold increase compared to 2016, which indicates a gradual recovery of production capacity of large construction companies.

Examining the results of large construction companies, we can note the overall positive dynamics of the main criteria, such as the volume of sales.

But if we examine such an indicator as the volume of products (goods, services) of large construction enterprises, it decreased significantly, by 16.7% from 22,308 to 18,582.2 million UAH.

Instead, such an indicator as the number of employees in large construction enterprises decreased in size by type of economic activity from 13 to 6.8 thousand people, respectively, in 2013 compared to 2018. At the same time, personnel costs of enterprises increased significantly from 708.9 to 1,093.2 million UAH, which was 54.21%.

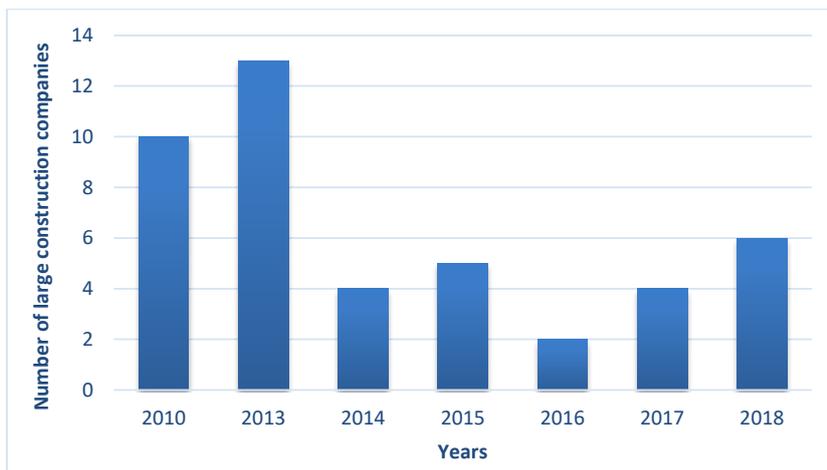


Figure 1. Number of large construction companies (State Statistics Service of Ukraine)

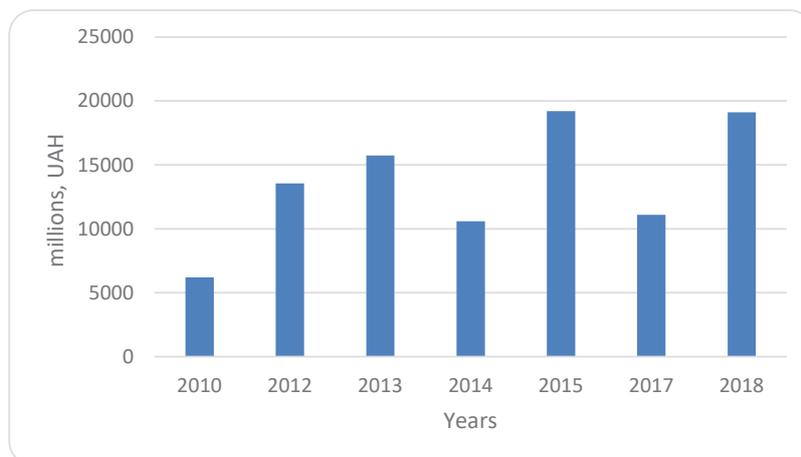


Figure 2. The volume of sold products (goods, services) of large construction companies (State Statistics Service of Ukraine) (2016 – data are not published in order to ensure the implementation of the Law of Ukraine "On State Statistics" on the confidentiality of statistical information)

According to the State Statistics Committee of Ukraine (State Statistics Service of Ukraine), domestic large construction companies in 2018 have a negative return on investment comparing with 2013. While in 2013 construction companies received a profit of 11.48% of equity and 0.33% of total assets, in 2018 the losses amounted to 6.91% and profit to 0.33% respectively. In the following 2019–2020, large construction companies gradually improved their position, which requires further research and determines the relevance of this work.

3. Application of the DuPont method

For such an analysis, the authors used one of the well-known methods of DuPont (Decoding DuPont Analysis Access mode), which will help to identify the influence of a number of dependent factors on the resulting indicator. The data of the Construction enterprises (State Statistics Service of Ukraine) were used for calculations

The most common method of financial analysis in the European Union was developed by the DuPont managers. It is based on an equation that shows the relationship between return on invested capital, asset turnover, net income and financial leverage. That is, return on equity (ROE) is considered as the product of the following three indicators: return on sales (RS), asset turnover (AT) and the ratio of financial dependence (KFD) (Bielienkova, 2010):

$$ROE = RS * AT * KFD = \frac{P}{VK} = \frac{P}{V} * \frac{V}{A} * \frac{A}{VK},$$

where P is the net profit;

V is the net sales revenue;

VK is the equity;

A is the assets;

L is the liabilities.

According to this model, the return on equity depends on three factors, namely: return on sales, resource efficiency, the structure of sources of funds invested in the enterprise.

These three indicators, respectively, characterize the state of operating, investment and financial activities of economic entities (in our case – large construction companies). Therefore, in the practice of financial analysis, the return (loss) of equity is considered the most important final indicator, which focuses on the results of all activities.

The loss of equity of large construction companies in 2018 was influenced by these factors as follows:

$$ROE = \left(\frac{\begin{matrix} 290,6 \\ -397,2 - 1704,5 \end{matrix}}{2} \right) * 100 = -6,91\%$$

The loss of equity of large construction companies was mainly affected by the loss of

operating activities – as a result of uncovered loss of large construction companies in the amount of -1532.6 million UAH. The profitability of sales amounted to 1.52%.

Using the above equation, you can build a number of relationships that allow you to analyse the impact of various factors on the financial result. From these ratios it is determined what factors cause changes in profitability (loss) of equity – return on assets, business activity of the enterprise or industry as a whole, or the way of financing its activities (financing from equity or borrowed capital).

Each of the three factors in the DuPont equation depends on other indicators. For example, the profitability of sales depends on the amount of profit or loss from sales, which, in turn, depends on prices, costs, volumes and structure of sales. Costs depend on the prices of resources used and the volume of their consumption and so on. Consistently, considering the level by level, you can build an extensive system of indicators.

At the heart of this system is the return (or loss) of equity. By changing the values of indicators of any level, including even the most distant from the base, you can trace their impact on the resulting indicator (Figure 3).

Figure 3 shows that the losses of enterprises in the industry were affected by a decrease in uncovered loss compared to the previous year, which, however, could not compensate for the lack of equity of large construction companies.

This critical situation is caused by the lack of institutional support for enterprise development. Thus, the bankruptcy procedure, according to the Antimonopoly Committee, lasts more than two years. This means that non-viable enterprises continue to operate, negatively affecting the performance and development of the entire construction sector.

If we compare 2018 with 2013, we can determine that in 2013 the main factor that caused the loss of the construction industry was a sharp decline in investment activity in the country. This triggered a reduction in business activity, led to a sharp increase in losses and erosion of equity.

To remedy the situation it is required to restore the operational activities of large construction companies, search for orders, and return to the volume of work performed at the pre-crisis level. Enterprises that are unable to restore their solvency must go through bankruptcy proceedings, which should have a positive impact on the development of the construction sector.

4. The turnover of assets of large construction companies

The next factor that influenced the efficiency of large construction companies is the asset turnover ratio. Asset turnover characterizes the efficiency of use

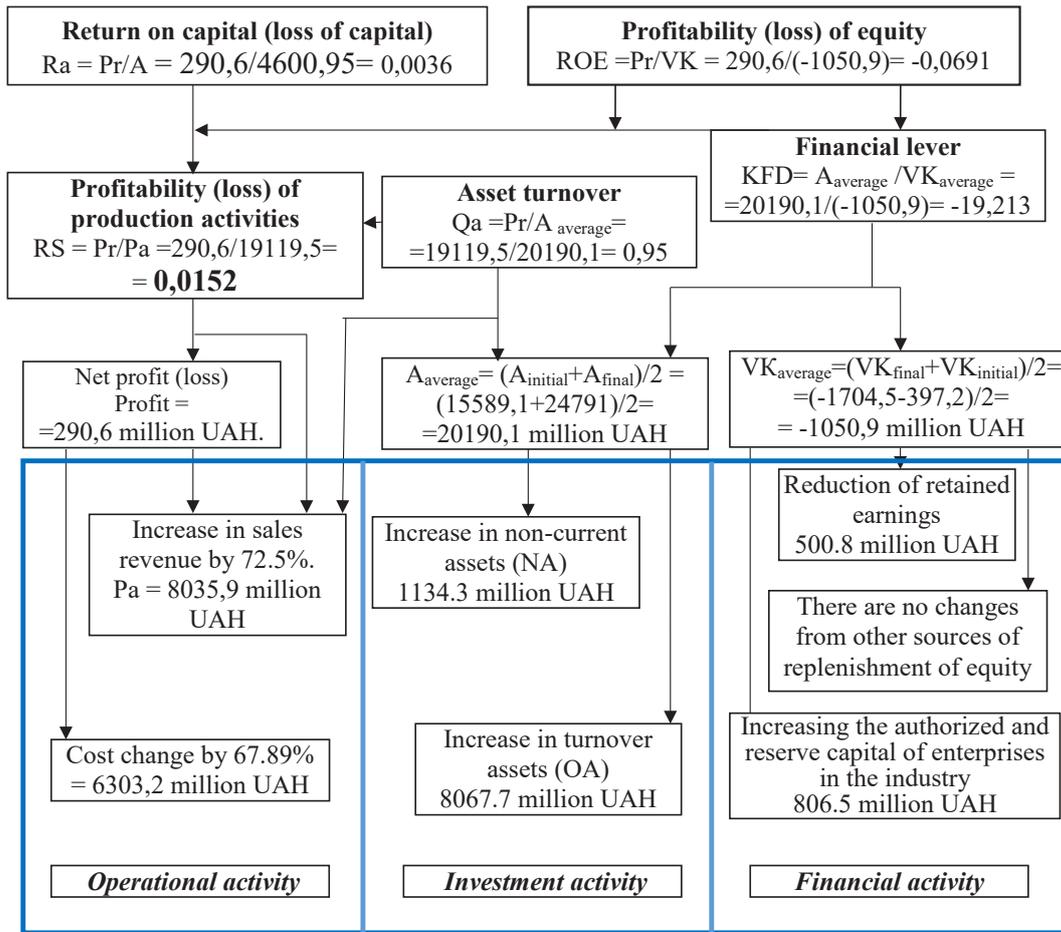


Figure 3. The impact of operating, financial, investment activities of large construction companies on the loss of equity of the industry in 2018 (State Statistics Service of Ukraine)

of all resources available to construction companies, regardless of the sources of their involvement. There is no normative value of this indicator, but the faster the resources of enterprises rotate, the better. Reducing the turnover of resources is a lever to reduce the financial well-being of the enterprise. The low level of asset turnover ratios may indicate insufficient capacity and low efficiency of production facilities.

The turnover of assets of large construction companies in 2018 increased significantly by 39.33% compared to 2013. However, this rather reflects the efforts of enterprises in the sector to maintain the volume of construction by increasing the number of cash cycles of working capital and a corresponding decrease in their volume in terms of reduced funding.

While in 2013, 1 UAH assets of the construction industry accounted for 1 UAH. 55 kop. net sales revenue, in 2018 it is already 95 kopecks. This indicates a significant increase in business activity of large construction companies in 2018. That is, the intensification of operating activities of large construction companies is currently continuing, but it does not provide even the minimum level of profitability of the sector. The small number of

profitable enterprises has a much smaller impact on the financial performance of the construction sector compared to a significant number of companies with losses.

According to the DuPont model (see Figure 3), the value of the loss of equity of large construction companies was also significantly affected by the coefficient of financial dependence (financial leverage). The model presents ratio of debt and equity and signals an increased risk of loss of financial independence by construction companies.

The level of financial leverage can determine the percentage change in return on equity when the financial result changes (without interest and loan tax) by 1% under different shares of borrowed capital in liabilities.

In 2013 the value of the ratio was more than 3, which meant that borrowed capital exceeded equity more than 3 times, in 2018 the ratio decreased significantly to -19,213, which presented a critical situation with equity and signals a low level of financial stability of the sector.

Increasing the share of borrowed capital in many cases has its advantages, as debt is beneficial in the

period of economic development, expansion of enterprises, and while inflation. In addition, the fee for the use of borrowed capital is a gross expense and is not taxed.

However, as the share of borrowed funds in the capital structure increases, so does the amount of fixed-term payments and the probability of failing to pay principal and interest due to adverse market conditions. This leads to an increase in the level of financial risk.

The reverse direction of the financial lever should also be considered. With a slight decrease in gross profit, return on equity will decrease significantly in an organization with high financial leverage and insignificantly – with low.

5. Conclusion

That is, during the period of growth of the enterprises and the increase in the volume of work performed and profits, the enterprises that have more value of financial leverage will work more efficiently, develop, and get a greater return on invested capital. Conversely, at a time of decline, a sharp decline in the volume of work performed, these companies will receive greater losses per unit of equity than those who pursued a more moderate borrowing policy.

Thus, a significant share of borrowed funds in the structure of the balance sheet of construction

companies, which were one of the main sources of growth of the construction industry during the development, significantly reduced the stability of enterprises in the crisis.

In the following 2019–2020, large construction companies gradually improved their position, which required further research and determines the relevance of this work.

The results of the analysis comparing not only from 2013 to 2018, but examining the general trend over all six years confirmed the findings of many scientists and experts that the main cause of losses of large construction companies is a sharp decline in construction in the country.

The use of the DuPont method for the analysis of profitability (loss) for large construction companies allowed a deeper analysis of the factors that influenced such indicators as return on equity, the indicator.

It has been found that the profitability (loss) of equity industries are influenced by the rate of business activity and financial dependence of large construction companies. Moreover, the main reason for the loss of the sector is the erosion of equity of construction companies, increasing the level of risk, reducing their financial stability. Additional measures are needed to revive the general economic situation in the country, including the digital transformation of construction, the search for innovative activities, the restructuring of institutional support for the construction sector.

References:

- Decoding DuPont Analysis. Available at: <https://www.investopedia.com/articles/fundamental-analysis/08/dupont-analysis.asp>
- State Statistics Service of Ukraine. Available at: <http://www.ukrstat.gov.ua>
- Izmailova, K. V. (2005). Financial analysis in construction. Kyiv: Condor. (in Ukrainian)
- Izmailova, K. V. (2000). Financial analysis in construction. Kyiv: MAUP. (in Ukrainian)
- Izmailova, K. V. (2001). Financial analysis: textbook. Kyiv: MAUP. (in Ukrainian)
- Krush, P. V. (2008). Regulation of the economy: theoretical and applied aspects: monograph. Kyiv. (in Ukrainian)
- Sorokina, L. V., Stetsenko, S. P., Goiko, A. F. and other (2017). Econometric tools for managing the financial security of a construction company: a monograph / for science. ed. Doctor of Economics, Prof. L. V. Sorokina. Kyiv: Kyiv National University of Construction and Architecture. (in Ukrainian)
- Helfert, E. (1996). Technique of financial analysis. UNITY.
- Stetsenko, S. P., Belenkov, A. Yu., & Antropov, Yu. V. (2018). Forecasting economic stability (on the example of small construction companies in Ukraine). Ways to increase the efficiency of construction in the formation of market relations, no. 36, part 2, pp. 73–78.
- Izmailova, K. V., Belenkova, O. Y., & Mogolivets, A. A. (2019). The essence of economic cycles and their impact on the financial stability of the building. *Scientific works of NDFI*, vol. 2, pp. 138–150.
- Bielienkova, O. (2005). Profitability analysis of the construction industry using deterministic models. *Construction production*, vol. 46, pp. 120–122.
- Bielienkova, O. (2010). Analysis of loss of construction enterprises by the method of DuPont. *Galician Economic Bulletin*, vol. 4(29), pp. 184–188.
- Goiko, A. F. (2008). Economics of construction. Kyiv National University of Construction and Architect. Kyiv. (in Ukrainian)
- Bielienkova, O. (2020). Factor analysis of profitability (losses) construction enterprises. *Economics, Finance and Management review*, vol. 1, pp. 4–16. doi: 10.36690/2674-5208-2020-1-4
- Almazari, A. (2012). Financial performance analysis of the Jordanian Arab bank by using the DuPont system of financial analysis. *International Journal of Economics and Finance*, vol. 4(4), p. 86.

- Angell, J. & Brewer, B. (2003). Improving the Coverage of the DuPont Approach of Financial Analysis in Finance Courses Through the Use of the Net Leverage Multiplier. *Journal of Economics and Finance Education*, vol. 2. Available at: <https://www.economics-finance.org/jefe/fin/Angellpaper.pdf>
- Babayev, V. & Cech, N. (2016). Analysis of capital utilization of joint-stock companies in the construction industry of Ukraine. *Technology audit and production reserves*, vol. 4/5 (30), pp. 17–21.
- Filatov, E. & Nechaev, V. (2014). Problem-solving in deterministic factor analysis. *Middle-East Journal of Scientific Research*, vol. 19(5), pp. 723–728.
- Filatov, E. & Rudykh, L. (2014). Factor analysis of financial profitability according to the author methods. *World Applied Sciences Journal*, vol. 29(7), pp. 908–914.
- Ivanilov, O., Peretiatko, A., & Bozhiday, I. (2012). Factor analysis of Ukrainian railways by the DuPont method. *Bulletin of Economics of Transport and Industry*, vol. 38, pp. 186–189.
- Zeltser, R. Ya., Bielienskova O. Yu., Novak Ye., & Dubinin D. V. (2019). Digital Transformation of Resource Logistics and Organizational and Structural Support of Construction. *Science and innovation*, vol. 15(5). R. 38–51.
- Bielienskova, O., Stetsenko, S., Sorokina, L., Molodid, O., & Bolila, N. (2020). System of preventive action of construction enterprises on the basis of identification of anticrisis potential. *Scientific Journal of Astana IT University*, vol. 3, pp. 15–27. doi: 10.37943/AITU.2020.53.13.002
- Stetsenko, S. P., Tytok, V. V., Emelianova, O. M., Bielienskova, O. Yu. & Tsyfra, T. Yu. (2020). Management of adaptation of organizational and economic mechanisms of construction to increasing impact of digital technologies on the national economy. *Journal of Reviews on Global Economics*, vol. 9, pp. 149–164.