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# INFLUENCE OF UNCERTAINTY LEVEL ON DYNAMICS OF CAPITAL STRUCTURE OF INDUSTRIAL ENTITIES IN UKRAINE

**Problem stating.** The uncertainty in the economy, which is deeply comprehended theoretically and methodologically in scientific and applied economic literature, transformed and expressed through the prism of the operation and management of large industrial enterprises, which in turn, under the influence of risks and objective macroeconomic conditions also form unstable external market environment. The uncertainty in the economic development of industrial enterprise is always caused by the cumulative effect of various levels factors. A lot of the researches of famous scientists (including John Maynard Keynes, Alfred Marshall and Arthur Cecil Pigou) were devoted to features of forming and development of manufacturing systems under uncertainty. For example, Keynes defended the statements that the value should be calculated based on expenses from unpredictable changes in market prices, excessive wear of fixed assets and injuries resulting from accidents. A. Marshall and A. Pigou believed that companies, that operate in uncertain market conditions and profit of which is an unknown and variable, should be managed based on the specific criteria such as the size of profits and the magnitude of its fluctuations. Based on this statement the capital investment project with lower oscillation profits is optimal among few investments projects with the same profits.

**Analysis of recent researches and publications.** Because of the development of productive forces and specific production relations, usually market volatility is a cause of dynamism and tendency of growth for uncertainty organizational and economic environment of industrial enterprises. A lot of works of Ukrainian and foreign scientists were devoted to issue of improving capital management of industrial enterprises, for example O. Amosha, A. Arakelian, I. Aleksandrov, I. Blank, S. Bogachev, V. Bubenets, I. Buleiev, Y. Vorobiev, S. Ischuk, R. Koval, O.Kuzmin, S. Mocherny, P. Pavlov, D. Palterovich, M. Prokopenko, Y. Pasichnyk, O. Tereschenko, K. Pavlov. For example, I. Ansoff, analyzing the instability of business conditions in the USA, distinguished few successive stages of its growth over the last century [1]. However, only some aspects of the capital structure improvement and diversification of its usage ways are elaborated, but they lack consideration of uncertainty factor in market instability. Thus, the need for theoretical study of these problems and practical application of research results caused the choice of topic of this article.

One of the main causes of uncertainty in the industry is the impact of scientific and technological progress, which leads to the emergence of new scientific and technical information and finally new manufacturing technology. The investment process has significant impact on the uncertainty, which has a probabilistic nature due to diversity of present-time production process, territorial allocation and cooperation in production. This issue was especially emphasized in works of M. Petrakov and V.Rotar, which are actual till now [10].

**The purpose of the article lies** in analysis of forming the capital of industrial enterprises in instable market conditions, considering the issues regarding increase of investment activity and as result growth in renewal of fixed assets of industrial enterprises.

**Target determination.** Attention concentration on the required argumentation and improvement of approaches in problem solving regarding industrial enterprises' capital increase. One of the practicable ways for recovery from the recession could be public-private partnerships, science parks within which investments could be attracted, and high technology for renewal of the main facilities of industrial enterprises.

**The main material.** Requirements for short-term payback period which is the aim of the majority of Ukrainian industrial enterprises in the instable market conditions, lead to reductions in capital investments, which in turn increases the average equipment usage period and decreases labour productivity. It is obvious that the basis for growth of Ukrainian economy is labour productivity. Over the last 10 years, average labour productivity increase in the country (the cost per labour unit) was 7.2%. This factor makes the largest contribution to the GDP formation and its growth. According to the research performed by McKinsey & Company, labor productivity in Ukraine has increased due to better utilization of production capacities, and particular industries even practically reached the limit load capacity. For example, 95% of the production capacity were used in steel industry in 2006-2007 [6]. However, the operation of obsolete plant and equipment requires more labor costs. It is caused by the fact that staff of major industrial enterprises has to carry out repairs and maintenance instead of production process. Overall labour productivity in the domestic economy is only 16% of the USA level. This index is calculated by McKinsey & Company based on the volume of GDP PPP (GDP taking into account purchasing power parity) per employed person. Renewal of the enterprises' capital is one of the factors of labour productivity increase.

Recent scientific researches show that the strategy of many industrial companies in Japan and Western Europe

is focused on long-term prospect. This approach is based on rejection of short-term profits to get benefits on the market in the long-term prospect. Because of influence of investors through securities purchase, management of American industrial companies safeguards sustainable profit increase. Large number of Ukrainian industrial enterprises spent their earnings for current consumption and do not invest in expansion of the production. It is caused by market instability. All this adversely affects the technical level and then efficiency level in the nearest future.

A prerequisite for the scientific understanding of influence of the uncertainty level on the dynamics of industrial enterprises' capital structure is a more pragmatic understanding of the "capital" and its structure. Certainly, from a methodological point of view comment of A. Marshall regarding completeness and uniqueness of "capital" definition significantly impact understanding and interpreting of "capital". "Capital is the accumulated stock of instruments that is used for the production of material goods and to achieve those benefits, which are usually considered as part of income. This is the core of resources, which is considered as a production factor, not as a direct source of satisfaction", the scientist writes regarding this issue [12, p. 48]. It should be emphasized that according to A. Marshall's statement, capital mostly consists of knowledge and organization, and one part of two is in private property and the other one not. In nowadays, some economists consider «organization» as the special production factor, which resulted in impact on the capital structure of enterprises.

According to the Institute of Economics and Forecasting of National Academy of Sciences of Ukraine, the average level of fixed assets depreciation in Ukrainian industry is more than 50%. In separate sectors it reaches 70% with renewal index 1-1.5%. Taking into account such renewal statistics, old depreciated fixed assets will be renewed not earlier than in 50 years. Thus, experts believe that the short change waves (cycles) in production, which are caused by obsolescence of fixed assets last about 10-12 years. Newest technologies can adapted to the production assets with appropriate novelty level [13, p. 151].

Market instability affected the structure and dynamics of fixed assets renewal process. Instead of normal expansion of production capacity, its renewal and maintaining in working just «eating away» of capital assets occurred.

The good example is the coal industry, which is during last 10 years losing its importance as one of the industries that provides energy security.

Statistics of the main indexes of public sector coal industry demonstrate only more recession. Thus, in Ukraine there was sharp decrease in number of operating mines (from 276 in 1991 to 160, including 140 public ones, in 2008), production capacity (from 193 million tons in 1991 to 95 million tons in 2007). The most of enterprises in coal industry are bankrupts by substance. They continue to operate in instable market conditions only due to Ukrainian government support. During last 16 years labour potential of the industry sharply decreased. Number of employees decreased on 640 thousand, or 74% of total number of employees. Per experts' beliefs, the main factor affecting industry development is lack of investment. This makes it impossible to provide forestalling putting into operation of fixed assets. The following factors that lead to market instability in this sector could be mentioned:

— imperfection of legislation in this field;
— low management efficiency;
— imperfect mine fund structure;
— high depreciation level of coal mining enterprises' fixed assets;
— harsh conditions of mining;
— low mechanization level of mining operations;
— significant depreciation level of equipment;
— insufficient number of employees.

Systematic approach to improve the capital structure of the coal mining enterprises, on our view, should take into account that market instability is caused by the fact that major part of coal mining enterprises are not market subjects but have to operate in the market environment. It means that methods and forms of public administration should be modified taking into account the market environment.

At the same time the analysis and comparison of public sector of Ukrainian economy to the country's economy as a whole, shows that sharp fluctuations in foreign markets, increase of prices for imported fuel, government decisions can significantly distort proportions in the efficiency levels of different industry sectors. According to the Centre for Economic Development, the public sector contribution to the financial performance of the economy as a whole does not reflect real actual of the economic potential. Thus, according to the Centre, the most representative information for 2006 shows that the public sector's share in sales volume accounted for only 11.2%, in net income — 11.9%, but at the same time its share in the residual value of fixed assets and intangible assets — 24.5% and the number of employees — 21.0% [8, p.35]. This demonstrates the fact that comparing to the private sector there are assets that operate with low efficiency or are not used at all in public sector. Permanently loss-making enterprises are represented with group of state enterprises (except for strong natural monopoly), which used to show a negative financial results from operations during all three years before the crisis.

The most representative indicator which shows the dynamics of industrial enterprises capital structure is capital investment. Structure of capital investments by separate industries is presented in Table 1.

According to the data in Table 1 total investments in 2008 amounted only to 85.4% comparing to 1990. Analyzing this index, according to information published by State Statistics Committee of Ukraine, capital investments in Ukraine in 2009 amounted to UAH 151.78 billion, that is

*Table 1*

**Structure of capital investments by economic activities (% to total amount)***

| | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|
| Total amount, UAH million | 93,096 | 125,254 | 188,486 | 233,081 |
| 1990 – 100 % | 56.8 | 67.6 | 87.7 | 85.4 |
| Agriculture, hunting, forest sector | 5.4 | 5.8 | 5.1 | 7.2 |
| Fishing, pisciculture | 0.0 | 0.0 | 0.0 | 0.0 |
| Manufacturing industry | 37.6 | 35.8 | 34.1 | 32.9 |
| Trade, repair of motor vehicles, household appliances | 8.2 | 9.3 | 9.4 | 10.6 |
| Hotel and restaurant business | 1.6 | 1.2 | 1.4 | 1.4 |
| Transport and communication | 18.1 | 16.2 | 16.8 | 14.0 |
| Financing activity | 2.1 | 1.9 | 2.2 | 2.0 |
| Real estate, renting | 16.5 | 19.2 | 20.9 | 21.0 |
| Governance | 0.9 | 0.8 | 0.8 | 0.8 |
| Education | 0.9 | 1.0 | 0.9 | 1.0 |
| Health care and social assistance | 1.4 | 1.5 | 1.4 | 1.5 |

*Prepared in accordance with State Statistics Committee of Ukraine // Electronic source. Source access: www.ukrstat.gov.ua. Sections "Statistical information": capital investments.

41.5% less than in 2008. Total amount of used capital investment in 2009 accounted to UAH 192.88 billion, during previous year — UAH 272.07 billion. The pace of decline in capital investment for nine and six months period ended 30 September 2009 and 30 June 2009 respectively was higher — 43.7% and 43.3% respectively, that confirms the experts' assumption regarding lower comparative figures for fourth quarter of 2008, the period of critical recession phase. The most significant decrease in capital investments for 2009 occurred in the following economy sectors: fishing — on 65.7%, construction — 62.2%, governance — 55.6%, real estate and renting — 52.8%, health care — 50.7%, agriculture — 50.2%. Better situation could be observed in the following economy sectors: trade and repairs — with decrease of 45.3%, financing activity — 35.4%, manufacturing industry — 35.3%, transport and communication — 33.3%, production and distribution of electricity, gas and water — 30.2%. The slightest decrease occurred in hotel and restaurant business — 27.9%, mining industry — 25.1% and municipal services, cultural and sports — 18.4%. In 2009 share of state financing in total amount of capital investments amounted to 4.3% (2008: 5.7%), municipal financing — 3.1% (2008: 4.6%), enterprises' funds — 66.1% (2008: 59.3%), bank loans and other borrowings — 13.3% (2008: 15.8%). Share of foreign investments increased from 3% in 2008 to 4.2% in 2009. At the same time investments provided by investment funds decreased from 1.4% in 2008 to 2.1% in 2009. There was significant decrease of share of capital investments in own apartments construction and private housing construction made by individuals — from 3.5% to 2.5% and from 4.2% to 2.8% respectively. In monetary terms these indices decreased by 2-2.1 times, to UAH 5.5 billion and UAH 3.57 billion respectively [9]. Structure of capital investments by financing resource is showed in the Table 2 below.

In general, the crisis has affected all areas of industrial production and significant decrease was observed in 2009: in metallurgy — 26.7%, chemical and petrochemical industry — 23%, mechanical engineering — 44.9%, food industry — 6% [7]. Such significant decrease in mechanical engineering is caused by sharp decline of investment demand on domestic market that resulted in decrease in transportation services and trading. The reason for this was as external factor, as internal one, which is the reduction of financial resources in the economy. Thus, the recession in 2008-2009 not only adversely affected the dynamics of production, but also worsened the financial situation of enterprises, and as result their creditworthiness. In addition, the increase in the shadow economy from 29.4% in September 2008 to 34.9% in 2009 (according to Ministry of Economy estimates) caused strengthening of tax pressure on officially working business and transferring of loan resources to public borrowing due to less income receiving caused by shadow economy.

The deterioration of financial position of industrial enterprises, a sharp decrease in their profitability and creditworthiness, increase of borrowing costs and a high degree of uncertainty regarding the depth and continuance of the recession affected not only the ability to fulfill current obligations, but also were a main factors their investment activity reduction. According to Ministry of Economy gross accumulation of capital decreased on 46.2% for 2009. There is significant decrease in public investment took place, capital expenditures per state budget for 2009 decreased on 51.5% comparing to 2008 (their share in the total expenditures per state budget decreased from 13.3% to 6.5%). As result, weak investment activity, the lack of long-term lending became a main factor of deep fall in construction (48.2% for the year) [7].

The issue of improving the structure and dynamics

*Table 2*

**Structure of capital investments by financing resources (%)***

| | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|
| State budget funds | 5.5 | 5.5 | 5.6 | 5.0 | 4.4 |
| Municipal budget funds | 4.2 | 4.3 | 3.9 | 4.2 | 2.7 |
| Internal enterprises' funds | 57.4 | 57.8 | 56.5 | 56.7 | 63.3 |
| Foreign investors | 5.0 | 3.7 | 3.5 | 3.3 | 4.5 |
| Privat housing construction (invested by individuals) | 3.3 | 4.1 | 4.5 | 5.0 | 3.6 |
| Bank loans | 14.8 | 15.5 | 16.6 | 17.3 | 14.2 |
| Other financing resources | 9.8 | 9.1 | 9.4 | 8.5 | 7.3 |

* Prepared in accordance with State Statistics Committee of Ukraine // Electronic source. Source access: www.ukrstat.gov.ua. Sections: "Statistical information".

of industrial enterprises' capital in instable market conditions is also could be solved using different alternative approaches. One of the options is a focus on import of industrial equipment and technology financed by foreign borrowings. Thus, one of the requirements to get low interest rate foreign bank loans by domestic industrial enterprises is to attract foreign companies (related parties) to support the implementation of investment projects. Usualy, technologies, that do not meet the nowadays requirements and are not focused on future needs, are imported to Ukraine. This, for example, "limits the industry development process (i.e. chemical and metallurgical), production of high-tech products. In the case of 90% depreciation of fixed assets this option does not provide a radical improvement in the industry" [11]. It means that scientific potential of Ukraine is lost, machine-building production capacity is not used, working positions are decreasing, social problems are exacerbated. The second option to improve the dynamics of industrial enterprises' capital structure is the way of innovation and investment that is focused on creating and implementing modern technologies and equipment based on the best national and international developments. Of course, for this purpose it is necessary to provide domestic scientific and technical potential with good conditions for development, and government should support basic and sectoral sciences. There are production companies in Ukraine, such as OJSC "Zavod napivfabrykativ" (Zaporizhia), OJSC "Chysti metaly" (Svitlovodsk), chemical and metallurgical plant OJSC "Mariupolsky metalurgiyny kombinat imeni Illicha". Amount and sources of financing are shown in Table 3 below.

Public-private partnership is widely used in the world for capital accumulation investment programs implementation, especially in the introduction of new technologies. This partnership is based on coherent system of relations between public and private partners, when resources of both partners are combined with appropriate allocation of risks, responsibilities and remuneration between them. Such cooperation should be mutually profitable and transparent because of state budget funds using in the investment process. There are principles of public-private partnerships, which are used by governments of developed countries in state regulation. The main principles are as follows: equal compliance of public and private partners with the legislation, agreed interested of public and private partners for the purpose of achieving mutual benefits and goals of the partnership, fair allocation of risks associated with execution of the public-private partnership agreement. The Law on Public Private Partnership came into force in Ukraine this year. In accordance with its statements the public-private partnerships are characterized with providing higher technical and economic performance indexes comparing to the same activity performed by the government with no private partner involvement. Within the public-private partnership relations cooperation agreements, concession agreements, products distribution agreements and others could be concluded.

Industrial parks could be another way for renewing production capacity and intensifying investment process of the companies. In this case effective mechanism of stimulation from the government side is necessary required. It could be partial reimbursement of interest expense on loans used for the construction of roads and facilities for water supply, drainage, sewerage and water treatment, introduction of advanced energy-and resource-saving technologies, recycling of household and industrial waste, and allowance for application of accelerated depreciation for new fixed assets of groups 3 and 4 within the program (business plan) of the industrial park operation.

**Conclusion.**

Based on analysis of the uncertainty level impact on the dynamics of industrial enterprises' capital structure it should be emphasized that this issue requires further research. It caused by the fact that companies have to adapt their capital structure in the current environment taking into account instable market conditions that are caused by the influence of as external as internal factors.

In uncertain conditions, a dominant component of the capital should be revealed based on an analysis of assets. It will make the companies able to get profits. In addition, there is dichotomics associated with different views on industrial companies' capital. On the one hand, capital is

*Table 3*

**Projected amount and sources of financing silicon production in Ukraine [11].**

| Financing source | Amount of financing, UAH mln | Including each year | | | |
|---|---|---|---|---|---|
| | | 2009 | 2010 | 2011 | 2012 |
| State budget | 188 | | 29.85 | 73.5 | 84.65 |
| Other sources (investments) | 2,562 | 804 | 879.1 | 512.8 | 366.1 |
| Total | 2,750 | 804 | 908.95 | 586.3 | 450.75 |

defined as aggregated tangible and intangible assets. On the other hand, capital is defined as diversified liabilities which are owned by different owners, and used as sources for creation and renewal of the company's assets.

Based on analysis performed we could conclude that the main factor influencing capital dynamics in recession is exogenous one which is generated by the governance taking into account sectoral and structural proportions

**References**

1. **Ansoff I.** Strategic management / I. Ansoff. — London : Macmillan, 1979. 2. **Ansoff, I.** Strategies for Diversification / I. Ansoff // Harvard Business Review. — September-October 1957. — Volume 35, Issue 5. — pp.113-124. [Electronic source] : www.quickmba.com. 3. **Baker Malcolm P., Wurgler Jeffrey.** Market timing and capital structure // Journal of Finance. — February 2002. — Volume 57, Issue 1. — pp. 1—32. [Electronic source] : onlinelibrary.wiley.com. 4. **Modigliani, F.; Miller, M.** The cost of capital, corporation finance and the theory of investment // American Economic Review. — June 1958. — Volume 48, Issue 3. — pp. 261—297. [Electronic source] : www.jstor.org. 5. **Myers Stewart C., Majluf Nicholas S.** Corporate financing and investment decisions when firms have information that investors do not have // Journal of Financial Economics — June 1984. — Volume 13, Issue 2. — pp. 187—221. [Electronic source] : www.sciencedirect.com. 6. **Возобновление** экономического роста Украины // McKinsey & Company. — К., окт. 2009 г. – С. 4—5. 7. **Державна** програма економічного і соціального розвитку України на 2010 рік (Антикризова програма) // Закон України «Про Державну програму економічного і соціального розвитку України на 2010 рік» від 20 травня 2010 року // Відомості Верховної Ради України, 2010 р., №33. – С. 470. 8. **Державний** сектор і функції держави у період кризи / О. Й. Пасхавер, Л. Т. Верховодова, О. М. Кошик, К. М. Агєєва, Д.П. Згортюк. — К. : СПД Моляр С. В., 2009. — 130 с. 9. **Інвестиції** в основний капітал скоротилися на 41,5%. [Електронний ресурс] // Економічна правда. — Режим доступу : www.epravda.com.ua/news/. 10. **Петраков Н. Я., Ротарь В. И.** Фактор неопределенности и управление экономическими системами / Н. Я. Петраков, В. И. Ротарь. — М. : Наука, 1985. — 191 с. 11. **Про затвердження** Державної цільової науково-технічної програми «Створення хіміко-металургійної галузі виробництва чистого кремнію протягом 2009-2012 років / Постанова Кабінету Міністрів України від 28 жовтня 2009 р. №1173. 12. **Реферат** підручника А.Маршалла «Принципи економічної науки» / референт укл. Фещенко В. М. — К. : АДС «УМКЦентр», 2001. — С. 48—49. 13. **Стратегічні** виклики XXI суспільству та економіці України : у 3-х т. / за ред. акад. НАН України В. М. Гейця, акад. НАН України В. П. Семиножинка, чл.-кор. НАН України Б. Є. Кваснюка // Т. 2 : Інноваційно-технологічний розвиток економіки. — К. : Фенікс, 2007. — 564 с.

**Nykytiuk T. O. Influence of uncertainty level on dynamics of capital structure of industrial entities in Ukraine**

In the article pressing theoretical and practical issues with regards to ways of industrial entities adaptation to the new conditions of business in the conditions of market instability with the purpose of capital increase are considered

*Key words:* uncertainty, market instability, capital assets of enterprise, investment, public-private partnership, production potential.

**Никітюк Т. О. Вплив рівня невпевненості на динаміку структури капіталу індустріальних об'єктів в Україні**

У статті розглядаються теоретичні та практичні проблеми шляхів індустріальної адаптації об'єктів до нових умов бізнесу в умовах нестійкості ринку з метою збільшення капіталу.

*Ключові слова:* невпевненість, нестійкість ринку, основні фонди підприємства, інвестиції, приватно-державне партнерство, виробничий потенціал.

**Никитюк Т. О. Влияние уровня неуверенности на динамику структуры капитала индустриальных объектов в Украине**

В статье рассматриваются теоретические и практические проблемы путей индустриальной адаптации объектов к новым условиям бизнеса в условиях неустойчивости рынка с целью увеличения капитала.

*Ключевые слова:* неуверенность, неустойчивость рынка, основные фонды предприятия, инвестиции, частно-государственное партнерство, производственный потенциал.

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