

**Microeconomics**

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**THE SYSTEM OF FIXED  
AND CURRENT ASSETS  
OF THE MACHINE-BUILDING COMPLEX  
OF UKRAINE****Abstract**

The article analyses the system of current assets in the machine-building complex as a type of economic activity taking into account its internal and external production factors. The author singles out the problem zones in the accounting asset classification system of enterprises, as well as corroborates the need for accounting optimization giving consideration for the specifics of technological production cycle, asset conversion cycle, and development of a differentiated approach to allocation of funds in the system of management.

**Key words:**

Machine-building, fixed assets, current assets, national accounts, production process, branch reproduction, competitiveness.

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## Introduction

Today, when Ukraine's economy is transiting to market-based methods of functioning, each enterprise should account on its own. The start-up and operating enterprises should decide by themselves how to produce goods of certain quality, in which volumes per period, and at which price to sell them in order to be competitive on a target market.

From this arises a significant problem concerning the importance and actuality of organization of the fixed and current assets. It is the current assets that – together with fixed assets – support the enterprise's activity, and if there are no current assets – there is accordingly no production process. A vivid example to it is the current state of Ukraine and the role of machine-building complex in it.

The theoretical foundations of the methodology of the given problem, its peculiarities and general principles of development were laid by I. Ansoff and R. Coase. Significant contributions to its development were made by Berman, E. Emeri, J. D. Barnett, P. Drucker, R. Emerson, Z. Yang, A. R. Sterling, I. U. Tulin, T. Saati, P. Y. Bilyj, Y. P. Holubkov, D. D. Platonova, B. Y. Kvasnyuk, V. P. Aleksandrova, M. M. Yakubovskyy, A. A. Chuhno, M. V. Popov and other scientists, who proved that the main factor of economic development is the accumulation of capital through reproduction of priority industries, in particular the machine-building complex.

The **scientific novelty** of this article consists in the analysis of the system of fixed and current assets of the economy, in establishing the dependency of capital accumulation on the effectiveness of machine-building complex functioning as a type of economic activity, and in formulating the scientific base for differential classification of the system of financial capital of machine-building enterprises.

**The task** of this study is to analyse the system of fixed and current assets of the machine-building complex. The methods of investigation are based on the analytical approach and processing of statistical information about industrial enterprises of the machine-building complex of Ukraine and macroeconomic indicators of the system of national accounts.

## Presentation of the Main Material

The activity of economic subjects concerning the creation and distribution of goods is realized in the process of combining fixed and current assets, in particular the labour itself.

The continuity of the production process and commercial activity needs permanent investment in these elements in order to realize its expanded reproduction.

The current capital in the machine-building industry as a type of economic activity passes through three stages of conversion: cash capital, production capital and commodity capital. At the first stage, cash is advanced to acquire and accumulate the needed stock of inventories [1].

In contrast to fixed productive assets, current assets are consumed within one production cycle, and their value is fully carried forward onto the value of the finished good. At that, one part of these assets in the material form appears in the produced good and turns into commodity form, which is finally used up by a consumer. The other part is fully consumed in the production process, but, having lost its consumer value, does not come into the product of labour in the material form (fuel, other energy resources, expense materials).

In the economic literature, there are different approaches to defining the essence of the current assets of industrial production. Certain of the economists simplistically interpret them as «subjects of labour», «tangible assets» or «circulating means» [2].

The current assets of an enterprise are called to provide its continued motion at all levels of circulation in order to satisfy the needs in money and material resources, to ensure the timeliness and completeness of payments, and to increase the efficiency of current assets.

All sources of current asset financing are divided into in-house (own), borrowed, and outside finance. Own current assets play the main role in the organization of productive assets circulation, since profit-seeking machine-building enterprises should have some material and operating independence in order to run their business profitably and carry responsibility for their independently taken decisions.

The formation of current assets occurs at the moment when the enterprise is organized – i.e. when its statutory fund is created. In this case, the source of finance is the investment facilities of the founders of an enterprise. The correct estimation of the amount of current authorized capital is a very difficult task. Most of the currently operating machine-building enterprises were founded back in the USSR, and the current state of the authorized circulating capital does not give a clear picture in this aspect any more. In the course of operation, the sources for replenishment of current assets are the earned profit and similar to equity capital «fixed liabilities». These are the assets that are not owned by the enterprise, but are continually circulating in it [1, 2]. Such assets are the main source of current assets formation in machine-building enterprises, and their amount ranges within the minimal balance of current assets. They include the following: minimal carried forward (from month to month) payroll liabilities to enterprise workers; reserves on reimbursement of future expenses; minimal carried forward liabilities to budget and non-budget funds; creditors' money received as

prepayment for produced goods or services; buyers' money received as collateral of refundable packaging; carried forward balance of consumption fund, etc.

To reduce the general need of the economy for current assets of the enterprises of machine-building complex and also to stimulate their effective use, it is expedient to attract borrowed capital.

Borrowed current assets are mostly short-term bank credits, which are used to cover a temporary extra need for current assets. For the purpose of current assets formation, credits are attracted along the following lines: credits for the seasonal stock of raw materials, as well as materials and expenses related to seasonal production process; temporary replenishment of lack in own current assets; realization of payments and mediation of payment turnover. The seasonality of production was not a usual practice for machine-building, but now, taking into consideration the marketing policy, this factor becomes ever more important for enterprises.

In its production process, a manufacturing (machine-building) enterprise prepays money for product creation in the amount equal to value of consumed inventories, carried-forward value of fixed assets and the value of labour itself (wages and related expenses). The production stage in the cash conversion cycle ends with output of finished goods, after which starts the stage of distribution.

At the final stage, the money is prepaid until the commodity form of value turns into the cash form. The cash form taken by current assets at the third stage of the cycle is, at the same time, the first stage of the next cash conversion cycle. Thus ends the reproduction of the machine-building industry.

Due to time uncertainty, the stage of distribution under the impact of market conditions and stochastic factors of the market economy can take a long time, which creates problems of capital reproduction and capital renewal.

From the former USSR Ukraine inherited a really powerful machine-building complex as a part of its manufacturing industry. Such production – large in terms of available working areas, equipment facilities, labour, and raw-material resources – can exist and reproduce only under certain conditions.

The main condition is the availability of the current capital that can cover the manufacturing expenses of the future periods. Thus, at bottom of fact, the current productive assets of most machine-building enterprises of Ukraine (approximately 70% of manufactures) [4] carry out the function of supporting the available production, the socio-stabilizing function.

A differential approach to classification of assets will give an enterprise the opportunity to start the production cycle with an already formed package of orders, which will shorten the duration of a production cycle and raise almost all macroeconomic indicators for machine-building, especially profitability and income, as well as reduce the cost value of production.

However, today the flexible mechanism of handling assets at machine-building enterprises is limited by measures of administrative regulation (taxes, instructions, etc).

Let us try to examine fixed and current assets from the standpoint of accounting system.

First, current assets are money resources invested in current means of production and means of circulation to provide for permanent production and distribution of finished products.

Second, current assets are assets that can be converted to cash during one working cycle or one calendar year. Some scientists similarly define the term «working capital», which testifies to the identity, in their opinion, of the terms «current assets» and «working capital».

We should take into consideration the fact that the accounting scheme used to classify assets into fixed or current ones has its own specifics depending on the type of economic activity of a certain enterprise. Machine-building enterprises differ from other industrial enterprises by the incomplete technological cycle. In the foreign economic literature, some authors define working capital as current assets minus current liabilities. This method is used to estimate the owned working capital.

The circulation of current capital and new value creation occurs in the following way:

$$M - G \dots P \dots G' - M', \quad (1)$$

where  $M$  – prepaid money;

$G$  – object of one's labour (a good);

$P$  – production;

$G'$  – finished product (a good);

$M'$  – money received from distribution of the created product.

The aim of capital functioning will be reached when  $M' = M + \Delta M$ , i. e. when there is an increment of money above the prepaid amount.

As a result, the self-growth of capital occurs during the circulation of current capital, which in the machine-building passes through almost all known stages of capital circulation and turns mostly into commodity form. Current capital participates in the new value creation not directly, but by means of current assets [2].

The composition and location of current capital depends on the sphere of its functioning: production sphere, commodity mediation sphere, services (including financial services) sphere.

In the machine-building production sphere, current capital (current assets) is advanced into current means of production and into means of circulation (Figure 1).

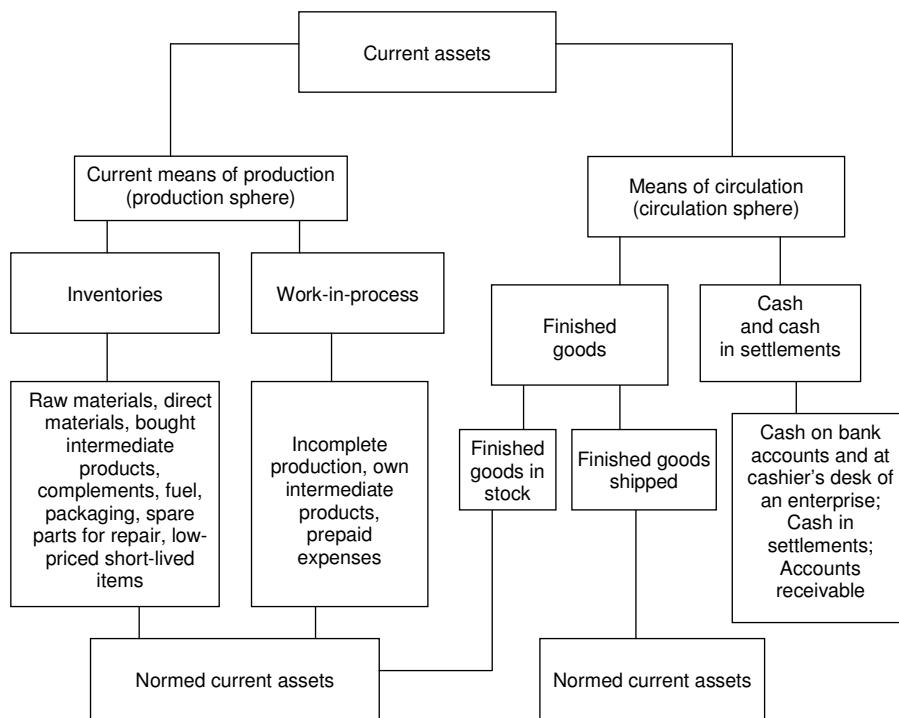
The means of production include raw materials, direct and indirect materials, intermediate products, fuel, packaging, spare parts for repairs, low-priced short-lived items, work-in-process, owned intermediate products, and deferred expenses.

The means of circulation are the remains of finished goods in stock of an enterprise, shipped but yet un-paid finished goods, and enterprise's balance of cash on its current account in the bank, cash available at cashier's desk, cash in settlements, accounts receivable, and in short-term securities.

Thus, current capital (current assets) is the money advanced into current means of production and means of circulation to provide for permanent production process, product distribution, and profit generation.

Figure 1.

**Composition and location of current assets**



The analysis of the structural elements of Ukraine's GDP proves the presence of deep disproportions in the process of fixed capital accumulation in Ukraine and the need to broaden and specify the interpretation of accumulation, which is not limited to accumulation fund and its use only. Fixed capital (FC) accumulation should be viewed as a permanent transformation into real factors of accumulation of some part of output and credit resources on condition they are effectively used in the creation of value added, taking into account adequate consumption of fixed capital. Thus, accumulation – is an essential link of extended reproduction, whereas reproduction – is a general reproductive form of accumulation. At that, the relationship between them can be both linear and non-linear, when the rate of extended reproduction exceeds the rate of accumulation or vice versa, which reveals itself through indicators of capital productivity and capital intensity.

In view of the aforementioned, the reality of growing FC accumulation in the machine-building, as a source of industry's stable economic development, is questioned. Economic theory asserts that the sources of economic growth are either the extensive use of production factors – labour and capital, or the increased effectiveness of their use in result of technical progress. For the economy of Ukraine, as well as for the machine-building industry as a branch of industrial activity, this law has its specifics. On the one hand, we have approached the threshold when production growth is possible only by means of capital investment, as opposed to the recent situation when it was possible to increase production growth by loading the production capacities to their full, as they had been used only at 50%. Under conditions of establishing market relations in Ukraine, the 100% load of production capacities of the enterprises of machine-building complex is impossible *a priori*. This means that the future growth should be determined by positive dynamics of investments or capital accumulation on gross and, especially, net basis, as we cannot imagine serious modernization under the current rate of capital accumulation.

On the other hand, owing to the new, improved technologies, the efficiency of production factors increases by itself; therefore, the modernization is needed in view of a serious gap between the efficiency of technologies used in our country and that of the advanced global technologies, which supports the idea that the only way of economic development – is a wide-scale replacement of the majority of technologies currently in use with the new technologies compliant with the world standards. In its turn, all this requires that the process of fixed capital accumulation on the net basis should be activated in the manufacturing industry as a whole, and in the machine-building in particular.

The scientists were used to have different views on the accumulation problem: some of them thought that the norm of accumulation defines the rate of economic growth; others believed that it was the efficiency of accumulation; still others accounted for both factors. However, for Ukraine especially important is also the focus on the norm of absolute and net fixed capital accumulation (NFCA), the reason to it being the serious gap in the scales of FC consumption in the developing countries and in the developed ones. Thus, the efficiency of accumulation depends not only on the volume of accumulation – as it would

mean extensive development, – but on the degree of renovation of an active part of FC, most often connected with NFCA.

According to the research carried out by the author and the Institute of Economic Prognostication of NASU, the net accumulation of fixed capital – which is the best reflection of investment activity as a component of economic development – in the GDP of Ukraine made 7.4% in 1989 and 6.3% – in 1990, which was 2.5 times less than in Korea and Japan, which had ambitious plans of achieving high rates of economic growth, and 1.4-1.7 times less than the OECD average in 1978-1987 (during the decade, the GDP growth of 1% in these countries accounted for 7.6% of gross and almost 4% of net accumulated fixed capital in the expenditure pattern of GDP). On the contrary, the consumption of fixed capital was as many times higher in Ukraine as in these countries, which was explained by the unsatisfactory quality of capital assets and an abnormal need for their repairs and replacement; as a result, the expenses for maintenance of the existing production facilities limited the opportunities for their expansion and for the pursuance of a progressive structural policy. This is especially visible on the example of the manufacturing industry of Ukraine, the element of which is the machine-building complex. Thus, it is not surprising that in Ukraine already in 1989 has started a general decline in production reflected even in the official data.

The period of 1990–1998 is characterized by the drop of NFCA in GDP from 6.0% in 1990 to 0.8% of GDP in 1998 (Table 1); all this under conditions of falling GDP, when the change in GDP (in % to previous year) was – 8.7% in 1991 against 1.9% in 1998. Even though the years 1990–1998 combine the period of transformational decline of Ukraine's economy in 1991–1994 and the period of early depressive stabilization (1995–1998), the process of capital accumulation – as distinct from many inconsistencies in economic reproduction – underwent the deepest deformations. The early sings of positive NFCA dynamics have started to appear only in 1999, which was preceded by a totally chaotic shifts in net accumulation (in % to previous year) – from 70.0% in 1991 to 35.4% in 1994 d to 34.4% in 1998.

According to evaluations of Ukraine's economic situation, it was 2000 when certain positive signs in favour of finished goods production – especially in food industry and to some extent in the machine-building – appeared, which coincided with a positive trend in NFCA. That is why the thesis about a decisive role of net fixed capital accumulation in the cyclical development was fully confirmed by the practice of Ukraine's economic development.

In 2003 the increase in capital investments made in construction – 29.8%; in machine-building – 1.5 times; in food industry – 28.5%; in carbon production, nuclear fuel, products of oil processing, light industry – 1.7 times; machine-building – 2.8 times. This laid the foundation for a 12.0% growth in 2004, since the rate of growth in capital investments that year decreased by 3.3% against 2003, which was momentarily reflected in the NFCA dynamics: the change in NFCA made +64.8% against +119.0% in the previous year; its absolute volume grew only 1.9 times against 2.3 times in the previous year (Table 2) [4].



Table 1.

**Net fixed capital accumulation dynamics in the Ukrainian economy**

Year	In actual prices, bn rubles.; bn hryvnas	In relative prices, bn rubles; mn hryvnas	% to GDP (in actual prices)	% to GDP (in relative prices)	Rate of increase (% to previous year, in actual prices)	Index of change (% to previous year)	NA (% to GA year-on-year, in actual prices)	NA (% to NA year-on-year, in actual prices)
1990	10.03	–	6.0	–	–	–	26.1	31.3
1991	6.414	3.0	2.1	2.0	–4.0	30.0	10.6	14.0
1992	418.718	16.0	8.3	6.0	6883.3	266.6	30.6	46.6
1993	6330	166	4.3	3.9	1410.8	39.6	17.5	31.1
1994	54650	4097	4.5	3.6	763.4	64.8	19.3	34.5
1995	273611	42267	5.0	4.0	400.7	77.3	21.6	101.0
1996	2189	1272	2.7	2.6	–	46.4	13.0	138.4
1997	1175	1094	1.5	1.4	–46.3	50.0	6.4	691.2
1998	815	771	0.8	0.9	–30.6	65.6	4.1	230.9
1999	1901	1521	1.5	1.5	133.3	186.7	7.6	31.0
2000	3204	2707	1.9	2.0	68.6	142.4	9.6	27.5
2001	5908	5215	2.9	2.8	84.4	162.8	14.7	32.9
2002	7129	6849	3.2	3.2	20.7	115.9	16.5	26.9
2003	16190	15582	6.1	6.3	127.1	218.6	29.4	45.7
2004	31244	26680	9.1	8.9	193.0	164.8	40.2	49.9
2005								
average 1993–2005	–	–	3.9	3.7	–	–	–	–

Note: NA – net accumulation; GA – gross accumulation.

Source: Статистичний щорічник Держкомстату України. – К., 2005.

The long-term crediting and investment crediting have been growing at leading rates, which supported the positive dynamics of economic growth in Ukraine. However, the structure of credit investments – as a source of future profits and accumulation growth – turned later to be ineffective. Exceptions were only some enterprises of extractive and processing industries, including machine-building enterprises of different forms of ownership and organization. Inasmuch as the major borrowers were as before the economic subjects of wholesale and retail trade, trade in transport facilities and repair services, the share of which in the overall volume of credit investments was the largest – 41.9%, the credit volumes were directed not into production sphere, but into trade and mediation. This is the key problem in crediting industries with complete technologi-

cal cycle and complete cycle of capital turnover. Machine-building is among such industries. The pay-off period of investments in the machine-building complex (MBC) can make 8 to 12 years. This makes the MBC unattractive for bank crediting. The lack of credits provides no space for optimal solution of manufacturing issues, and therefore, no financial stimuli for reproduction of enterprises in the machine-building complex.

*Table 2.*

**Changes in GDP and its components, in % to previous year**

Year	Change in NFCA	Change in FCC	FCC (% to GFCA)	Change in GDP	Change in GFCA
1991	-70.0	-4.0	90.0	-8.7	-19.5
1993	-60.4	-9.0	82.0	-14.2	-30.5
1994	-35.2	-27.0	81.0	-22.9	-41.0
1995	-22.7	+16.0	78.0	-12.2	-30.8
1997	-50.0	-0.1	94.0	-3.0	+2.1
1998	-34.4	-0.8	96.0	-1.9	+2.6
1999	+86.7	-5.0	92.0	-0.2	+0.1
2000	+42.4	+6.0	90.0	5.9	+12.4
2001	+62.8	+3.0	85.0	9.2	+6.2
2002	+15.9	+0.3	83.0	5.2	+3.4
2003	+119.0	-0.6	71.0	9.3	+22.5
2004	+64.8	+4.1	60.0	12.0	+20.5

Notes: NFCA – Net fixed capital accumulation; FCC – fixed capital consumption; GFCA – gross fixed capital accumulation.

Source: Статистичний щорічник Держкомстату України. – К., 2005.

In other words, the increase in net fixed capital accumulation exhibited improvements along its quantitative parameters, but no improvements in the quality of net capital accumulation, especially of its active part, due to modernization of the Ukrainian industry.

The growth of net accumulation is to some extent preconditioned by the decrease in fixed capital consumption (FCC). This fact – under conditions of critical deterioration of basic assets and negligible volumes of capital investments – is a real warning factor: since Ukrainian economy is excessively energy – and resource – consuming, an increase in prices on energy resources can lead to failure of entire industries, including the machine-building industry. The lifetime of basic assets constitutes 20–25 years, during 15 of which they had been only minimally renovated. Thus, now the situation appears as follows: the

consumption of basic assets by the owners of enterprises generated income which has not been capitalized, – and this gave enterprise owners the opportunity to reimburse privatization costs and, moreover, to sell totally deteriorated basic assets without any loss in the future.

Given the product value ( $w$ ) is  $c+g$ , where  $c$  – value of consumed means of production,  $g$  – newly created value, and  $g = v+m$ , where  $v$  – value received by the worker, and  $m$  – additional value, the formula for the product value will be the following:  $w = c+v+m$ , and from here, the formula for the additional value:  $m = w - c - v$ .

According to the System of National Accounts (SNA), to determine the additional value we take as a basic value the gross revenue of the whole economy, which is the part of additional value left to producers after deduction of expenses on labour and net taxes on production and imports, i.e. the profit which is already free from the worker's value, as shown in the formula.

The transition to additional product requires that the above value is also made free of the sum of consumed fixed capital, as, according to the SNA methodology, the consumption of fixed capital (in the value of estimated amortization) is included in gross indicators based on the fact that in the process of goods and services distribution this value returns to producer and accumulates, thus increasing the resources [3].

According to the methodology of additional value calculation, an increase in fixed capital consumption in an industry decreases additional value, whereas under conditions of inadequate value of fixed assets, it makes it impossible to measure the real value of additional product. Since for the calculation of fixed capital consumption we use the book value – not the market value – of basic assets (BA), then, in opinion of O. Y. Bolhovitina, the absence of BA register at enterprises on the basis of adequate indexation of the former and the continuation of the amortization reform would contribute to generation of savings and their transformation into accumulation. The problem is that these measures are possible only on condition that the income of FC owners will not decrease or will do so in the short-term period, whereas the return will increase, and income will decrease only at the expense of reduced taxable income.

The analysis of the situation with NFCA during 1990–1998 (Table 2) [4] and its comparison with trends in Ukraine's FCC and GDP prove that it is the rate and depth of the fall in net fixed capital accumulation (NFCA) that is responsible for the deep crisis in the economic system of industrial production. Such pattern of reproduction excluded the capitalization of income for fixed capital accumulation and stimulated the consumption model of development, and it does not stimulate the accumulation of fixed capital at enterprises that belong to industries with incomplete production cycle. At the same time, during 1991–1996 in the general volume of industrial production, the share of ferrous metallurgy increased from 11% to 22%, the share of power engineering increased from 3.0% to 13.0%, fuel industry – from 5.7% to 15.0%; whereas the share of

machine-building and metal-working industries fell from 31.0% to 15.0%, while the share of light industry fell from 10.0% to 2.0%. This means that the number of industries that produce finished goods is reducing. The first positive signs of exiting from the crisis were preconditioned by the increasing production of export-oriented goods characterized by high resource – and energy – intensity. Combined with low (compared with the world) prices on energy and natural resources, this allowed manufacturing products by using obsolete technology and without realizing any capital investments, which has brought to reduction of net accumulation and inadequate valuation of the capital consumed. The conservation of the technological backwardness of the country made it impossible to reach during the following years such a volume of FC accumulation that could have become a positive shock for stable reproduction of the industries.

These efforts – aimed at shortening of the turnover period of current assets, taking into consideration that enterprises are interested in prolongation of the credit repayment period – can be reworded by driving the financial and operational needs (FON) to zero or even to negative value, when the machine-building enterprise will retain even more cash means than needed for an uninterrupted work. But then arouses the question about the efficiency of use of the remaining current assets. The volume of FON is often defined as the need in current assets or just as operational needs; it is defined as a sum of money invested in inventories minus the money in finished goods, accounts receivable and accounts payable. Different methods of FON are widely known. For the practice of machine-building industry, it is very convenient to estimate FON in % of sales revenue.

In case the result of FON estimation equals, for example, 50% – it means that the lack of current assets at an enterprise is equal to the whole half of its annual revenue, and the enterprise works 180 days per year only to cover its financial and operational needs. In the machine-building complex, the duration of the main production cycle can be 4 to 8 years, and the need in current assets can be a really big sum of money.

## Conclusions

Having analyzed all the foregoing, we can state that the system of managing and accounting for fixed and current assets used in the SNA and the existing accounting system needs to be approached flexibly and improved with regard to industrial enterprises of the MBC. It should be optimized taking into consideration the peculiarities of technological production cycle, asset conversion cycle, the elaboration of a differential approach to asset allocation in the management system of the MBC, given that the development of MBC is considered as a priority type of economic activity in the modern system of industrial production of Ukraine.

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