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WAYS OF OPERATING CYCLE REDUCTION IN MATERIAL PRODUCTION OF UKRAINE

The paper reveals the ways of operating cycle reduction at enterprises in the sector of material production in Ukraine. The state and the structure of current assets are analyzed, production and operating cycles of Ukrainian enterprises in the industry, agriculture, construction and trade are calculated. Subject to national legislation and experience of foreign corporations recommendations on operating cycle reduction are offered aimed at accelerating inventories turnover and payment of accounts receivables.

Keywords: current assets; inventories; accounts receivable; production cycle; operating cycle.

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ШЛЯХИ СКОРОЧЕННЯ ОПЕРАЦІЙНОГО ЦИКЛУ ПІДПРИЄМСТВ СФЕРИ МАТЕРІАЛЬНОГО ВИРОБНИЦТВА УКРАЇНИ

У статті виявлено шляхи скорочення операційного циклу підприємств сфери матеріального виробництва в Україні. Проаналізовано стан та структуру оборотних активів, розраховано виробничий та операційний цикли підприємств України в галузях промисловості, сільському господарстві, будівництві та торгівлі. Із врахуванням вітчизняного законодавства та досвіду зарубіжних корпорацій узагальнено рекомендації щодо скорочення операційного циклу, які спрямовані на прискорення оборотності запасів та інкасації дебіторської заборгованості.

Ключові слова: оборотні активи; запаси; дебіторська заборгованість; виробничий цикл; операційний цикл.

Форм. 2. Табл. 2. Літ. 17.

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ПУТИ СОКРАЩЕНИЯ ОПЕРАЦИОННОГО ЦИКЛА ПРЕДПРИЯТИЙ СФЕРЫ МАТЕРИАЛЬНОГО ПРОИЗВОДСТВА УКРАИНЫ

В статье определены пути сокращения операционного цикла предприятий сферы материального производства в Украине. Проанализированы состояние и структура оборотных активов, рассчитан производственный и операционный циклы предприятий Украины в отраслях промышленности, сельском хозяйстве, строительстве и торговле. С учетом отечественного законодательства и опыта зарубежных корпораций представлены рекомендации по сокращению операционного цикла, направленные на ускорение оборачиваемости запасов и инкассации дебиторской задолженности.

Ключевые слова: оборотные активы; запасы; дебиторская задолженность; производственный цикл; операционный цикл.

Problem setting. Timely and full financial provision of investment and operating activities are financial management's objectives of any company. If investment activity is related to purchase and sale of fixed assets and financial investments, operating activity – to production or sale of goods and services, which are the main purpose of an enterprise providing the bulk of its income (Order of the Ministry of Finance of Ukraine, 7.02.2013, # 73).

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Investment projects typically require long preparation procedures, a business plan, time to estimate the volumes, costs and structure of financial resources. Current activity's management needs the speed in decision-making, as it often requires immediate financing, especially when it comes to production processes, that cannot be stopped: seeding process, harvesting in agriculture, technological processes in chemical and metallurgical industries etc. Besides, business success is estimated by operating activity's results, the volume of its generated funds.

Duration of raw materials' preparation, production and sale of goods and services, collection of receivables is different in each company. The longer operating cycle of a company is, the more resources it requires, thus influencing the financial results of an entity. Therefore, reducing the operating cycle, determining and compliance with the norms on current assets are the key issues for any company, especially those, operating in the field of material production.

Latest research and publication analysis. This article is a continuation of previous studies, dedicated to identification of functioning and financial activity of industrial, agricultural, construction and trade enterprises (Konieva, 2015).

Dynamics and structure of current assets of the selected sectors' enterprises are influenced by changes in the economy, so there is a need for their constant monitoring, including that on the basis of statistical data. At the same time, specifics of the material production, including factors that determine the duration of operating cycles are presented in the research of L.M. Cherchik and A.M. Ivanchenko (2010), O.E. Gudz (2007).

Ways of operating cycle reduction the experience of foreign corporations has been explored by S.M. Bragg (2005), J. VanHorne and D. Vakhovich (2008). However, these recommendations should be implemented taking into account the economic sectors' specifics of domestic enterprises and be harmonized with the legislation of Ukraine.

The research objective is to determine the ways of operating cycle reduction in material production of Ukraine.

Key research findings. Investment activity is related to capital and financial investments of companies, operating activity focuses on current assets' management of a business entity. According to the international accounting standards entity shall classify an asset as current when: it expects to realise it or intends to sell or consume it, in its normal operating cycle; it holds the asset primarily for the purpose of trading; it expects to realise the asset within 12 months after the reporting period; or the asset is cash or a cash equivalent unless the asset is restricted from being exchanged or used to settle a liability for at least 12 months after the reporting period (International Accounting Standard, ec.europa.eu, 2011).

At the end of 2014 current assets of domestic enterprises make up about 54% in their property (ukrstat.gov.ua, 2014).

Following branches of material production sector were chosen for this investigation: agriculture, forestry and fishing (A); mining and quarrying (B) and manufacturing (C); construction (F); wholesale and retail trade; repair of motor vehicles and motorcycles (G) (Order of the State Statistics Committee of Ukraine, 23.12.2011, # 396). The investigated sectors of material production: trade; industry; agriculture; construction, form respectively 29.6%; 28.8%; 8.2% and 5.3% of the current assets of

Ukrainian business entities (Table 1). In turn, current assets of trade; agricultural; construction; industrial enterprises in their property covered in 2014 respectively: 82.7%; 68.5%; 64.2% and 46.8%.

Table 1. Current assets of domestic enterprises in 2014, calculated by the author on the basis of statistical data (ukrstat.gov.ua, 2014)

#	Index	Enterprises in general	Particularly in:			
			Trade	Industry	Agriculture	Construction
	1	2	3	4	5	6
1	Assets (property), mln UAH	5994265.6	1171108.1	2010917.3	390607	269574.6
2	Current assets, mln UAH	3271954	968579.8	942236.5	267541.1	173151.8
3	Inventories (including current biological assets), mln UAH	667512.2	205881	238461.9	96541.8	42751.2
4	Accounts receivable, mln UAH	1962772.1	575447.3	595111	151461	92131.7
5	The share of the sector in the current assets of all enterprises, %	-	29.6 (line 2 column 3 / line 2 column 2)	28.8 (line 2 column 4 / line 2 column 2)	8.2 (line 2 column 5 / line 2 column 2)	5.3 (line 2 column 6 / line 2 column 2)
6	The share of current assets in enterprises' property, % (line 2 / line 1)	54.6	82.7	46.8	68.5	64.2
7	The share of inventories in current assets of enterprises, % (line 3 / line 2)	20.4	21.3	25.3	36.1	24.7
8	The share of accounts receivable in current assets of enterprises, % (line 4 / line 2)	60	59.4	63.1	56.6	53.2

Current assets here include: inventories (raw materials; incomplete production; finished product; goods); current biological assets; accounts receivables; short-term financial investments; cash and cash equivalents; prepayments and deferred costs etc. (Order of the Ministry of Finance of Ukraine, 28.03.2013, # 433).

Comparing with fixed ones, current assets are characterized by liquidity, high degree of structural transformation, as a result of which they can easily be converted from one type to another, including money. Current assets quickly adapt to changes in the conjuncture of production and financial markets, change easily in the process of operating activity diversification.

However, accounts receivable and cash are subjected to losses from inflation; inventories suffer from permanent natural loss, physical and moral aging and require additional costs for saving. Duration of operating cycle has the risk to slowdown from dishonesty of partners or firm's own staff. Continuity of operating activity requires adequate financing, and therefore there is a need for rationing of current assets of an enterprise.

Analysis of the current assets of domestic enterprises in 2014 indicates that the share of the least liquid part of current assets – inventories – is on average 20.4% in Ukraine. Sectoral distribution did not reveal sharp declines. Inventories form 36.1%; 25.3%; 24.7% and 21.3% of all current assets in agriculture, industry, construction and trade respectively.

A negative factor is that 60% of business entities' current assets are accounts receivable. The term of its repayment in Ukraine is 152 days, and in agriculture and construction – more than 200 days (Table 2).

Table 2. Operating cycle of enterprises in material production sector in 2014, calculated by the author on the basis of statistical data (ukrstat.gov.ua, 2014)

#	Index	Sector			
		Agriculture	Construction	Industry	Trade
1	Net sales at the end of 2014, mln UAH	214972.5	149823.4	1488759.1	1704211.9
2	Cost of sales at the end of 2014, mln UAH	151037.8	113253.7	1243362.8	1469474.7
3	Inventories at the beginning of 2014, mln UAH	74912.70	41111.40	205225.90	170703.70
4	Inventories at the end of 2014, mln UAH	96541.80	42751.20	238461.90	205881.00
5	Average amount of inventories for 2014, mln UAH ((line 3 + line 4) / 2)	85727.25	41931.3	221843.9	188292.35
6	Accounts receivable at the beginning of 2014, mln UAH	93808.1	86730.4	459556.1	464407.8
7	Accounts receivable at the end of 2014, mln UAH	151461	92131.7	595111	575447.3
8	Average amount of accounts receivable for 2014, mln UAH ((line 6 + line 7) / 2)	122634.55	89431.05	527333.55	519927.55
9	DIO (days inventory outstanding) (360 / (line 2 / line 5))	204	133	64	46
10	DSO (days sales outstanding) (360 / (line 1 / line 8))	205	215	127	110
11	Operating cycle, days (line 9 + line 10)	409	348	191	156

The overwhelming share of current assets in companies' property requires an effective system of their management. After all, formation of inventories, covering cash shortages due accounts receivable need appropriate financial resources, amount of which depends on the duration of an operating cycle of a particular company.

The operating cycle of an entity is the time between assets acquisition for processing and their realisation in cash or cash equivalents (International Accounting Standard, ec.europa.eu, 2011).

During the operating cycle current assets pass several stages, when cash is transformed into inventories; raw materials and semiproduct are converted into incomplete production and finished goods. Selling products, a company can introduce various credit policy for its customers. In the case of early payments sold finished products are converted into cash. If customers are proposed more favourable conditions

and alter payments, finished products are converted into accounts receivable, which transfer into liquid form later.

Depending on the branch and sphere of activity, the volume of production and sale; duration, level of technology, production organization; supply and distribution system, methods of payment, operating cycle can be from one day to several years. When entity's normal operating cycle is not clearly identifiable, it is assumed to be 12 months (International Accounting Standard, ec.europa.eu, 2011). Usually operating cycle length is calculated in practice, fixed in the accounting policy order of enterprise and is constantly monitored.

Under the classic method, operating cycle (days) is calculated as the sum of DIO (days inventory outstanding) and DSO (days sales outstanding) (Operating Performance Ratios, www.investopedia.com).

DIO is computed as:

1. Dividing the cost of sales (income statement) by 360 to get the cost of sales per day figure.

2. Calculating the average inventory figure by adding year's beginning (previous year end amount) and ending inventory figure (both are in the balance sheet) and dividing by 2 to obtain an average amount of inventory for any given year. The sum of inventories will include: raw materials; incomplete production; finished product; goods; current biological assets.

3. Dividing the average inventory figure by the cost of sales per day figure.

The formula of DIO:

$$DIO = \frac{360}{\frac{C}{(I_b + I_e)/2}}, \quad (1)$$

where DIO – days inventory outstanding, days; C – cost of sales at the end of the year; I_b – inventories at the beginning of the year; I_e – inventories at the end of the year.

Thus, days inventory outstanding (prototype of production cycle) of material production sectors in 2014 are: agriculture – 204 days; construction – 133 days; industry – 64 days; trade – 46 days (Table 2).

According to the results, the longest production process is in agriculture as opposed to trade, which mainly focuses on the sale of goods purchased from resellers or directly from manufacturers.

DSO (days sales outstanding) is computed by:

1. Dividing net sales (income statement) by 360 to get net sales per day figure.

2. Calculating the average accounts receivable figure by adding year's beginning (previous yearend amount) and ending accounts receivable amount (both figures are in the balance sheet) and dividing by 2 to obtain an average amount of accounts receivable for any given year.

3. Dividing the average accounts receivable figure by the net sales per day figure.

The formula of DSO:

$$DSO = \frac{360}{\frac{S}{(R_b + R_e)/2}}, \quad (2)$$

where DSO – days sales outstanding, days; S – net sales at the end of the year; R_b – accounts receivable at the beginning of the year; R_e – accounts receivable at the end of the year.

Days sales outstanding in 2014: 215 days (construction); 205 days (agriculture); 127 days (industry); 110 days (trade).

First of all, it should be noted that DSO (term of payment for sold products (goods and services) exceeds DIO (production cycle) in all the investigated sectors. This is a negative factor and indicates the existing problem in the system of debt-to customers. This figure makes operating cycle of company much longer, adversely affecting mobility, business activity of entities, solvency of economy in general.

Summarizing DIO and DSO it is possible to obtain the duration of operating cycle in 2014: 409 days – in agriculture; 348 days – construction; 191 days – industry; 156 days – trade.

The results are related to the following. The shortest operating cycle among all sectors has trade, which sometimes combines the sale of goods and its own production. It is explained by the role of middlemen between producers and consumers. Trade enterprises generate constant cash inflows. Especially, when it comes to trade of basic necessities – food, clothing etc.

Production process of industrial and construction enterprises is quite lengthy. Heavy engineering, creation of multi-storey buildings always require much time and investments. Construction products are geographically fixed; has individual character; they are multi-detailed, complex and material intensive. Construction process requires a large number of participants; variety of economic connections with other sectors of the economy. Construction depends on the area (geological, hydrogeological conditions etc.); the impact of climate and weather conditions (Cherchik and Ivanchenko, 2010).

Agriculture has long production and operating cycle. For example, production of winter wheat lasts 10 months (Gudz, 2007). Besides, seasonality leads to uneven capacity utilization during the year, reducing the efficiency of companies in this sector. Agricultural products are subject to various natural losses, which require processing costs and specific storage conditions.

Since the operating cycle of the company consists of the length of inventories and accounts receivable turnover, ways of its reduction should be directed to these items of current assets.

First of all, system of current assets' management should be developed that can be implemented inside a firm. For example, one of the ways of current assets optimizing, including inventories, is rationing. To determine the required amount of inventory the volume of spending (production) item per day must be multiplied on rate (as days for delivery, documentation, discharge, storage of materials, preparing them for production etc.).

Monitoring of inventories in warehouses will timely detect surplus that can be sold and will lead to increasing of other operating income of a company. There are specialized middlemen that deal with information collection about the remains of materials in different companies and find potential buyers for them. Such materials can be bought at discounted prices, which is beneficial and reduces costs for customers.

According to S.M. Bragg (2005), items may help optimize the size of inventories: consolidation of warehouses for the following particular products; planning of time and volume of material use to avoid excess purchase; clear specification of materials and components in production.

The system of economical use of inventories should be supported by the implementation of new resource-saving technologies, which will minimize spoilage of raw materials, focus on waste-free production or recycling of production waste. Important role here belongs to production flexibility, when some tools (equipment, production line) can be quickly replaced by others in market demand; effective system of receiving and unloading materials; staff motivation in the implementation of such recommendations (VanHorne and Vakhovich, 2008).

Company has to review its assortment of finished products and goods to determine top positions, because focusing on them and avoiding others can often increase business efficiency. In general, increasing sales depends on marketing policy of a company, advertising, promotions, discount schemes, after-sale customer service etc.

Optimization of inventories is not possible without interaction with enterprise partners, including first of all raw material suppliers. According to experts, company has to avoid mediation between suppliers and direct consumers of raw materials, which will help reducing transaction errors and costs and would provide better control over prices.

Often business faces the challenge of warehouse's packing, which can be decided with the help of guaranteed sales agreements – arrangement under which a manufacturer or a supplier takes back goods that remain unsold after a specified period. It can be done for payment or in credit.

To speed up the days inventory outstanding and increase sales of finished products a company can use consignment agreements (sale or return, or goods on consignment) – a trading arrangement in which a seller sends goods to a buyer or reseller who pays the seller only when goods are sold. The seller remains the owner (title holder) of the goods until they are paid for in full and, after a certain period, takes back the unsold. It is profitable, because one side does not spend money for shop, realty, and another side of agreement – for buying products, only allocating them on its territory for payment.

To shortage the operating cycle a company may pass sales function for outsourcing to specialized firms or sell their products wholesale to small commercial agents, dealers, who will deal with retail customers.

Besides, the practice of production and supply on the principles of "just-in-time" is widely spread in developed countries, when suppliers ship raw materials at a certain time in the required amount directly to the workplace (Bragg, 2005).

As the vice-president of "General Motors Corp." R.B. Stone thinks, there is a need for effective implementation and operation of "just-in-time" system to: concentrate manufacturers (suppliers) and customers geographically to reduce the time and cost of delivery; quality assurance of raw materials and components; managed system of suppliers (maximum reduction of suppliers quantity and signing long-term contracts with them); guided transport system (VanHorne and Vakhovich, 2008).

The next item can be the implementation of electronic commerce, that can help: attract buyers from around the world, offer the widest range of products, out sales

staff, avoid goods' excess, accelerate the date of payment, create and manage an electronic database of customers and suppliers (Bragg, 2005).

More than third of all incomes in the USA in 2013 were received from e-commerce (UNCTAD, 2015). E-commerce for a specific target group can be in the form of relationship models: business to business (B2B), business-to-consumer (B2C), business-to-government (B2G) and consumer-to-consumer (C2C).

B2B models use electronic platforms – software for interaction of buyers and sellers through electronic communication channels. For example, one of these platforms ("Alibaba") shows that millions of entrepreneurs, using specially developed technical solutions, can quickly find buyers or sellers worldwide. For convenience, all products on the site are divided into specific categories; there are opportunities to search and filter by country or characteristics of a product. Built-in e-mail allows contacting suppliers quickly, informing them about the volume and terms of delivery of the selected products.

In Canada in 2013, the share of income received from B2B relations in all e-commerce revenue was 64%, in South Korea – 91%. In the EU B2B and B2G together make up 87% (UNCTAD, 2015).

Accelerating of days sales outstanding can be implemented through enterprise efforts to develop a system of discounts to customers for early payment; analysis of customer payment history and credit policy adjustments in this regard; automation of collection of accounts receivable; differentiation accounts receivable by amount; early billing of customers under long-term cooperation agreement; changing in conditions of commission payment to staff, when salary does not depend on sales, but on the volume of cash inflows from customers (Bragg, 2005).

There must be advanced forms of payment in relations between suppliers and buyers. Along with usual payments, the legislation of Ukraine provides the use of such documents as: payment request-orders, settlement check, letter of credit.

If in case of payment order the recipient of money depends on the decision of a payer to make transition, the initiator of operation using payment request-orders is directly supplier, who prepares the top of the document – request – and directs it to buyer (Resolution of the National Bank of Ukraine, 21.01.2004, # 22). The request-order and settlement check definitely help accelerate the collection of accounts receivable.

Reduction of turnover terms of claims to buyer can be provided by the letter of credit, when payment for sold goods is made by advanced special deposited funds. In this case, supplier receives a guarantee of payment, and customer can control the quality of delivered goods.

With the development of information systems introduction of acquiring – technological, information service of transactions carried out using electronic means of payment in the payment system – is also one of the major tools to strengthen the payment discipline of enterprises (Law of Ukraine, 5.04.2001, # 2346-III).

When a client has funds shortage, operation of purchase-sale may be executed by a promissory note (Law of Ukraine, 5.04.2001, # 2374-III; Law of Ukraine, 23.02.2006, # 3480-III). The advantages for the supplier in this case are the abilities: to discount it at a bank, to pay partners with its help, to take a credit with a promissory note as a pledge, to receive debts back guaranteed in case of buyer's bankruptcy etc.

The way to refinance the accounts receivable is factoring service (forfeiting) – transfer the right of firm's debt collection to a bank (factoring company) in order to receive credit for current activity financing.

In the extreme case supplier can apply to the Commercial Court with a claim for enforcement of debts returning from the buyer or start a bankruptcy procedure.

In case of contract violation and failure to pay for delivered products, the supplier is entitled to a reduction of income tax by writing off the costs of doubtful (hopeless) debts that are calculated and confirmed appropriately under domestic legislation (Order of the Ministry of Finance of Ukraine, 8.10.1999, # 237).

Conclusions. Our results reveal that companies of the material sector of Ukraine have a long operating cycle. The main reason for this is a term of accounts receivable turnover, which in all the investigated sectors exceeds production cycle.

For reducing the operating cycle of enterprises in the material production the two ways are proposed: optimization of inventories and of accounts receivable.

To decrease the material component of current assets a firm should: implement a system of inventories' regulation and monitoring, resource-saving technologies; avoid mediation; assess the possibility of guaranteed sale agreements, consignment, outsourcing sales; practice supply and production "just-in-time", timely revise and improve its marketing policy, promote e-commerce.

Acceleration of the collection of accounts receivable can be made through an effective system of accounting and control by personnel, appropriate credit policy of customers, reducing taxation with reserve of doubtful (hopeless) debts, implementation of advanced forms of payments, using factoring (forfeiting).

Reducing the operating cycle will have positive impact on the structure, volume, term and cost of the involved resources for current activity financing, the analysis of which is our idea for further research on enterprises in the material production sectors.

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