TRANSPARENCY IN THE LIFE CYCLE MANAGEMENT OF FINANCIAL INSTRUMENTS OF INDUSTRIAL PRODUCTS

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Summary. The specificity of lifecycle management of industrial products as a set of activities that are coupled in a certain way over time and space require an appropriate organization for its development and control. In this sense, companies must have such an organizational attitude that stimulates and implements an appropriate policy that provides competitive advantage and high efficiency. Essentially, this means well-established network linkages and functional links at all organizational levels and all units. This organization is a set of relatively stable relationships that exist between its components. It is a means of transparent management through which the goals, strategy and policy of the companies are realized. The purpose of this article is to explore the process of managing the life cycle of industrial products using financial instruments.

Transparency in product life cycle management.

Firms themselves determine the way they operate and develop according to market requirements and formulate their goals, defining and realizing relevant development priorities. Thus, they organize transparency in their activities, taking into account the organizational conditions and the impact of internal and external factors. In this context, it is of paramount importance to create conditions for the transparency of the life cycle of the industrial product in its management with financial instruments . This is particularly typical and necessary for industrial products that refer to the category of tangible assets. Thus, different valuation approaches are used to determine the value of industrial products that have the nature of tangible fixed assets. All of them, however, are related to the asset's cost of production and it changes throughout the product's life cycle. It has different factors at different stages in its formation, but not all are taken into account in its assessment. All evaluation methods are tailored to evaluate it after login in operation, without taking into account impacts when it was produced but not yet in operation (storage time).

It has been shown that industrial products have the strongest influence on the following groups of factors, which have a certain interrelationship with each other;

- Physical waste, which begins after the product has entered service.

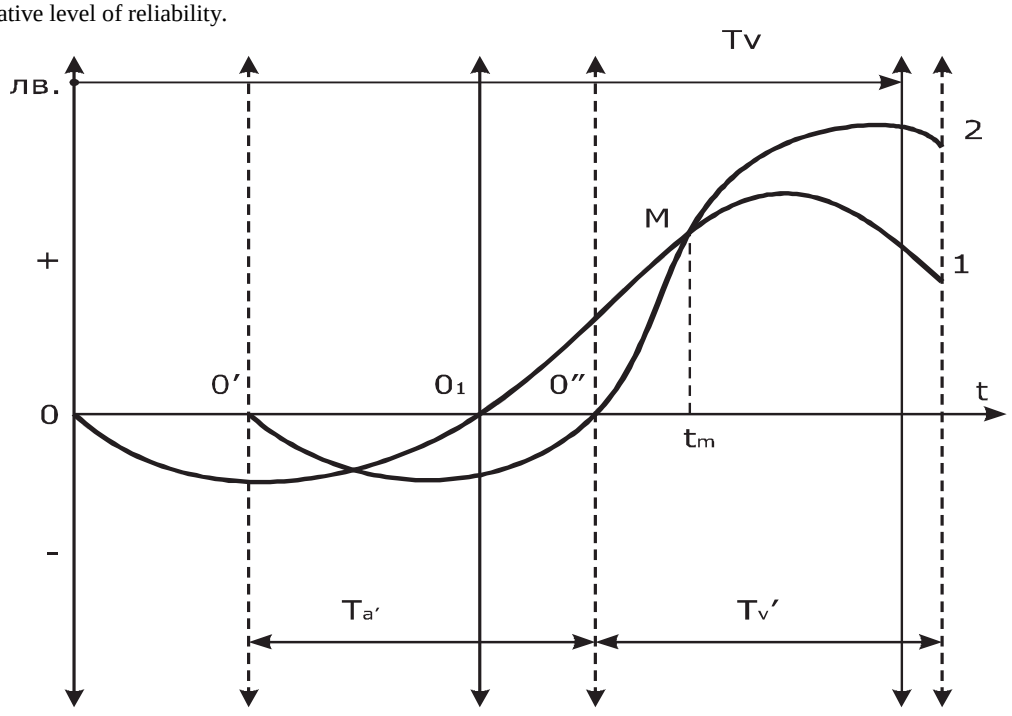
-Innovation aging that affects throughout the product lifecycle from start to finish. It leads to the search for approaches and ways to shorten operational life, to extend the warranty period and to increase the normative level of reliability.

-Economic devaluation with globalization and high technology is creating an increasingly dynamic development environment. This in essence means that this indicator will play an increasing role in the future and more and more assets and industries will depend on it The most commonly used assessment approaches are currently: revenue, cost and market. When applying the different valuation approaches, a discount factor is applied that reflects the movement of money over time. This process is strictly regulated, both normative and factual. After the asset is released, its amortization or accrual of depreciation charges is initiated, which presents different risks. Differentiation methods are used at different stages of the product's life cycle. This toolkit can also serve as an attempt to methodologically summarize the individual discounted methods that can be used at different stages of the product's life cycle.

Characteristics and stages of the life cycle of an industrial product.

The life cycle of the industrial product is its main feature, which characterizes and represents the period from its origin to its sunset. In this case, an industrial product that includes two models is considered. In this case, the model will only mean design changes without altering the main technical performance of the product such as performance, weight, gauges, etc.

Or these are the main indicators whose change leads to innovative aging of the old product to the new one. The life cycle graph of such a product with two models is shown in Figure 1 and is shown in a bulk without the individual stages of the cycle being indicated.



where:
t - time
Ta, Ta '- investments, including the idea, study, design and production stages of the 1st and 2nd industrial product model.
1 and 2 models
Tv, Tv '- including development, realization, maturity and aging for 1 and 2 product model.
M, tm - innovative innovation aging for the 1st model
At sunset for the industrial product is meant not a complete depletion of the product's lifetime resource, but aging has resulted from new design solutions that are better designed and improved. A distinction should be made between the life cycle of the first model and the life cycle of the second model. For one product we can have several successive model solutions. In addition, the life cycle of the product as a whole is a concept that expresses the change in sales and profits from product creation to market marketing. However, they have many common ground. For example, in innovation aging of the innovative solutions set in the product, there is a drop in sales due to a partial loss of competitiveness.
Receiving data during work in a highly automated information environment opens up new opportunities in the field of services related to the use and service of the product. Conditions and the opportunity to make unified, accurate, accurate information solutions at every stage of the product's life cycle are created.
Managing the life cycle of the product.

In the case of product lifecycle management, the industrial company manages all information in real time using information technology. The goal is to provide the relevant information at the right time and scope, thus requiring comparisons of market, consumer, company and regulatory requirements , benchmarking and more.
The concept of lifecycle management of an industrial product (asset) is important in:
- developing new products as the life of innovative products is short and the development of a new product requires ever greater investment;
- building an efficient product and technological structure of the companies;
- the complex study of innovative solutions for the past and future, which would provide a rich information base for evaluation and prognosis of product and technology prospects.
- Discontinuous processes in these conditions - risk.
-Economy of development of these processes.

It is therefore important not only to examine the life cycle of the industrial product, but also the possibilities for its management with financial instruments, requiring full transparency of the life cycle of the product (asset).

To analyze the theoretical basis of the discount processes in estimating the revenues and expenditures under the conditions of rapid innovation aging.

To study the factors that affect the level of cash flows - species, nature, impact strength

Look for alternative solutions to eliminate the harmful effects on the estimation of the forecasters that form the value of the cash flows.

To examine the discount processes in these conditions and to determine the magnitude of the risk, etc.

Explore the patterns of development of these processes

Particularities of cash flows in the context of the rapid innovation of aging of tangible assets.

Cash inflows in the context of fast-moving aging of material assets influence various internal and external factors. Influencing external factors are innovation aging and internal regulations, state policy, and so on.
The manifestation of properties of rapid innovation aging manifests in the current and future value of the material asset. Thus properties of the present value in the context of alternative solutions against rapid innovation aging and in the case of planned aging can be managed with financial instruments. A particular role in this governance process will be played by discounting definitions such as discounted cash flow, cash flow, nature of the financial instrument, peculiarities. Discontinuous processes in these conditions of uncontrolled risk, the regularities of the development of these processes through the different stages of the life cycle.
Discontinuous processes in estimating revenue and expense under the conditions of rapid innovation aging.

The factors that influence the level of cash flows determine their type and nature can also be divided into internal and external, Alternative solutions for eliminating the harmful effects on the estimation of the forecast elements forming the value of the cash flows can be taken internally.
Based on the life cycles of the different products, their interaction and a complex impact on the main economic indicators, it is deduced that the company provides resources and the dynamics of the company's development. At any given time, companies must maintain a dynamic balance between opportunities and reality, to take the production of the old products in a timely manner, to maintain the maximum volume of production of those products that provide high efficiency and to carry out the necessary research and engineering developments for the creation and introduction of new products in production. The life cycle of an innovative product is given in Figure 2.

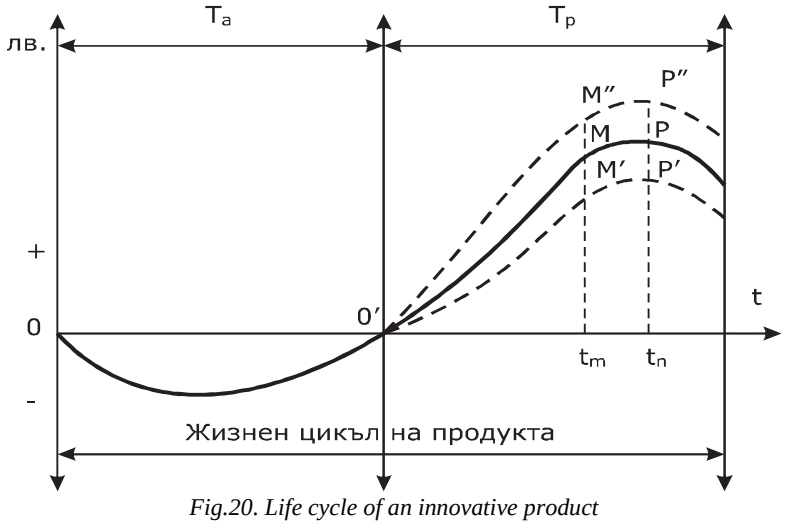


Fig.20. Life cycle of an innovative product

where:
t - time;
Life cycle of the product, including its production;
Tr - sales;

1 - cash changeover curve where investments are invested during periods of time and in the period of return are reversed with the profit;

M, M ', M "- emerging innovation aging at time tm and points P, P', P" - change of profit.
In the life cycle of the product, we have a change in the time span (tm-t), which is derived from the effects of various factors. This decline is for both sales and profits. This means that even after the innovative aging of the innovative product in you, the sales and the profits for a certain period of time continue to grow, with the decline only after R, R '.
This is due to the impact of various internal and external factors, such as the conservative nature of consumer taste, advertising, market specificity, etc. Despite the impact of these factors, the product's life cycle has already exhausted its resource and the company should create new innovative products.
The life cycle curve consists of a development cycle and a market cycle. The market cycle covers product entry time, growth, maturity and declining sales.

The stages of the life cycle of an industrial product and its characteristics are reflected in Table 1. For individual companies, they may vary according to the specific objectives, resources and competitive environment of the company

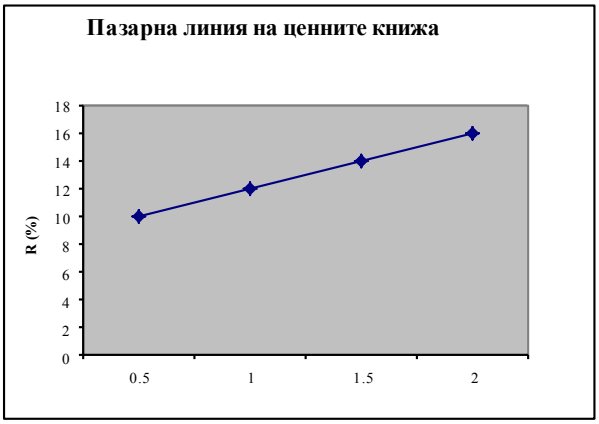


Table 1. Life cycle stages of an industrial product

Criteria	***Stages of the life cycle of an industrial product***				
	Development of design, production	*Introduction*	*Growth*	*Maturity*	*Decline*
Competition	One product		average	Strong	Small
Users		Innovators	Serial Market	Serial Market	Reduction
Product assortment	Two models	One model	The number is growing	Full assortment	Save
Sales		Depends on the conditions	GrowGrowss	Grows	decreases
Profit		Small	Нараства	High	decreases
Strategy	Designing a new product	Experiment of the new product	Zero Series	Sales	

In fact, one product may have more than one model, and their life cycles usually do not match the life cycle of the product. The product may also have innovative obsolete elements and designs or innovative elements whose life cycle is even higher even after
Summation Method) се описва от следната обща формула:
$r_e = r_f + \sigma_r + s_r$
the innovative product aging, the product to mark a market downturn but some innovative elements in it are at an early stage or in growth respectively

Formation of a discount factor as a financial instrument to derive the market value of tangible assets.

When estimating the market value of tangible fixed assets, different valuation approaches are used. When applying the different valuation approaches, a discount factor is applied that reflects the movement of money over time. This process is strictly regulated, both normative and factual. After the asset is released, its amortization or accrual of depreciation charges is initiated, which presents different risks. The measurement and evaluation of the degree of risk includes;
The method of accumulation (risk-build)
proposed a decade ago by James H. Schild and later extended to specific cases by **Shannon Pratt** (Summation Method) is described by the following general formula

r = rf + σr + sr
re - expected rate of return:
rf - risk-free rate of return:
σr - the general risk margin:
sr - the specific risk margin:
One of the commonly accepted methods of measuring the overall risk of an investment is to calculate the standard deviation of risk from the average.

$$\sigma = \sum_{I=1}^{n} (Ri - R)\, pI$$

Where p_I is the probability of occurrence of this condition.

Each discount rate, regardless of the method of its determination, includes the following three relevant elements:

1. Return on risk-free investment.
2. A risk premium that expectations of return on the capital market in general - one of the most stable elements of the norm.
3. Risk specific risk that depends on the particular company. For companies with a lower risk than the capital market, it can also accept a negative value.

THE CAPITAL ASSET PRICING MODEL (CAPM) FOLLOWS THE USE OF FACTOR B FOR RISK MEASUREMENT:

re = r f + b. (rm-rf)
re - expected rate of return:
rf - risk-free rate of return:
b - Systemic risk:
rm - average market return:
(rm-rf) - the total market premium.
The above formula gives the formal relationship between two variables by which the model determines the cost of capital assets as their function:
1. The Required (Required) Rate of Return (RRR),
The risk consists of a systematic and non-systemic component. The systematic risk measure is the coefficient of the linear regression equation β, the value of which represents the return of a single share versus the return on the whole market and reflects the market sensitivity of a share. The average value of b of all shares is 1.0. If a share with a higher rate of return on the market is more risky, ie it will fall more at the same rate of decline in the market. From a mathematical point of view there is no upper limit for β, the lower is 0. For most actions, the value of β ranges from 0.5 to 1.5.
The risk premium for a share will be determined by the product of the total market risk premium for equity and the corresponding b. To assess a particular b, data from the relevant branch is used. If a market is missing, data on the share of other companies' shares in the particular branch is used. The cost-to-income (R / E) relationship is formed, and then an analysis is made of whether the enterprise is more or less risky to find its place in the line of business in the branch.
The theory of the model is based on the following three idealized assumptions:
• Smooth market - ie. complete, completed market (without friction), in which each asset is completely detailed and each person can buy individual details of these assets, there are no taxes, no information costs and there is a great deal of demand and supply, so the individual can not influence the price:
• rational behavior - everyone acts on a rest that will give him maximum wealth and reduce the risk, so everyone is very well informed:
• homogeneity of expectations - all people have fully matched expectations in terms of predictable revenue.
shares, or do not have shares at all on the market, bits can not be measured directly. However, there is a significant correlation between b and the risk that can be calculated from companies' financial statements. Because the non-systemicity component of the risk (not reflected in b) is too important for components that are not public, do not have shares in the market, the risk analysis part of the financial condition analysis is a very important part of the assessment process.

Determination of the discount rate (rate of return)
The discount rate (rate) for bringing a sequence of net cash receipts to a value at the present time can be determined by the Weighted Average Cost of Capital (WACC), the Capital Asset Valuation Model (CAPM) the method of risk, the dividend yield method, according to the Gordan model and the Arbitrary Pricing Theory (ART).
This methodological toolbox provides the opportunity for financial impact and control over the stages and lifecycle of the product.

Conclusion

On the basis of the above, the following conclusions and summaries can be made:
Managing the life cycle of an industrial product (tangible asset) can define transparency across all product cycle loops. The use of financial instruments is a successful approach to management and control not only of the individual stages of the cycle but also an informational possibility for interim and prudent valuation of the asset.

References.

1. Damyanov D., Inovative Technology ISBN 978-619-7242-58-4, PRIMAX-Ruse, 2019 G.
2. Nikolova.I., (2018) Development and Application of Systems for Resource Planning ERP/ASP. Innovations in Discrete Productions, Issue 1/2018, Sofia, ISSN 1314-8907, pp.15-17
3. Demirova S., Basic Indicators Forming Effectiveness In Developing Product Innovations, GE-International Journal of Management Research, Vol.5, Issue 5, May 2017, ISSN(O):2321-1709, pp.113-122
4. Demirova S., Alternative Of Innovative Aging In SMEs By Lowering The Product Cost Price, , Vol 5, Issue 08, 2017, pp.1244-1252, DOI: 10.21474/IJAR01/5178, ISSN: 2320-5407 Journalijar
5. Oresharov,Pl. Finance analysis and investment management, Luren, 1992
6. Todorov, L. Modern Models for Business Assessment, Second Edition, New Star, 2014 г.
7. Copeland, T., T. Koller, J. Murrin. Valuation – Measuring and Managing the Value of Companies, John Wiley & Sons, New York, 2000.
8. Damodaran, A. Investment Valuation. Tools and Techniques for Determining the Value of Any Asset, John Weley & Sons, N.Y., 2002..