

SYNERGY ACCOUNTING IN THE AGE OF DIGITAL ECONOMY AND GLOBALIZATION

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Abstract. The article deals with defining synergies and substantiating their appearance and reflection in the enterprise accounting system. There is a model of synergy affecting an enterprise's efficiency when various resources interact in the age of digitalization and globalization of economic relations. The research offers an algorithm of automated accounting of synergetic effects by means of accounting simulation to strengthen synergy of factors affecting enterprise development. Procedures of synergy accounting in conditions of developing digital economy and globalization are improved.

Keywords: synergism, synergy, synergetic effect, accounting, digitalization, globalization.

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Introduction

Purchase and merger of companies are aimed at increasing their costs by realizing a synergetic effect considered within the framework of the scientific field (of the cross-subject approach) called synergy. Synergy (a synergetic effect) is often interpreted as an effect resulted from joint use of resources as compared to their individual use or a difference (either decrease or increase) resulted from combining separate parts to make an integer from their individual values. In national and international accounting and reporting systems, goodwill is a comparatively new and understudied category. It is displayed in accounting and reporting only when purchasing, merging and corporatizing companies. Enterprises can go either cheaper or more expensive than their algebraic sum before merging. This surplus ($2+2=5$) or negative ($2+2=3$) value results from a synergetic effect which can be either positive or negative. In the age of digitalization and economic globalization, investigation of synergy impacts on enterprise performance becomes more important and beneficial. Searching for ways to assess this effect, manage and control its results in the accounting system is essential. The greater fraction of the synergetic economic effect becomes, the greater efficiency of an enterprise's economic activity is achieved. The analyzed problem is topical because of underdeveloped methods and a controversial character of many issues of accounting of synergetic effects.

The research is intended to improve synergy accounting in the age of digital economy and economic globalization.

Synergy essence and origin in accounting

Synergetics as an economic category appeared in 1969 in the research by the German scientist Herman Haken (1980). As a new field of cross-subject investigations, synergetics included the methods developed in some knowledge areas and applied to others.

According to the explanatory dictionary of economics, synergism is a phenomenon of increasing the action of one catalyst by adding another one. The synergy theory is based on such scientific categories as fluctuation, emergence, attractor, complementary effect, chaos, and bifurcation. The system's instability and chaotic character lead to its leaping transition to a new state at the bifurcation point. The bifurcation point (from the Latin word *bifurcus* meaning *split*) is the moment of time when unpredicted transition from one state to another takes place. The state of the system is critical when it becomes unsteady as to fluctuations (disturbances) and ambiguity is observed: either the system becomes chaotic or there is transition to another state, for example, to more differentiated and higher orderability (*The reference book of the teacher, 2019*).

Emergence deals with the whole acquiring some specific properties which are not characteristic for its elements and sums of elements not united by system-forming relations. In other words, there arises a new form of integration subject to some other laws of functioning and development and it is more complicated than simple transformation of quantity into quality.

I. Prigozhin (*Prigozhin, 2003*) proves that the farther the system from the equilibrium state, the more vibrating processes appear, these causing significant fluctuations. Fluctuations (disturbances) in proximity to bifurcation points allow the system to find the most suitable direction of development called an attractor.

The complementary effect (from the French word *complementaire* and the Latin word *complementum* meaning supplement, supplementary) is the one that provides an opportunity to realize combined advantages by combining human, material and financial resources.

Economic efficiency is defined as a relative value which is a ratio of results and expenditures causing their achievement. The economic effect is a difference between results and expenditures facilitating their achievement. There are two methodological approaches to assessing efficiency - the statistical one which does not consider the time factor and the dynamic one based on the economic unequal value of expenditures and results of different duration which are to be adjusted to a common time moment by discounting.

In S. A. Kuznetsova's opinion (*Kuznetsova, 2012*), synergy means increased efficiency as a result of merger, integration of separate parts into a single system due to the systemic effects (emergence). The researcher considers the accounting system a separate totality of interacting elements that forms a determined singleness and has some integral properties enabling it to perform required functions within an enterprise.

P. O. Kutsik (2013) finds an additional functional in integral properties of the accounting data system that can be used to achieve synergy while making managerial decisions. There is no doubt that for managers, accounting data supplemented with business-analytics are of greater value than accounting information alone.

M. S. Pushkar (2013) defines synergetics as a single system indicating increased efficiency of an activity resulted from combining its separate parts. A synergy is understood

as additional increment either of economic or any other effects due to the system's self-management.

M.M. Shesternyk (2012) investigates manifestations of synergies in joint construction due to combining energy, labour, informational, financial and material resources of participants. It is expressed in terms of optimizing expenditures (reduced operational, constant and overhead expenses), efficient labour distribution, participants' increase of market shares, and enhanced financial stability of each participant. After regulating relations among the mentioned elements there appear new opportunities for investments and innovations, additional competitive advantages, proportional distribution of business risks among counteragents according to the joint construction agreement.

M.O. Kozlova (2012) proves that classical theoretical and methodological approaches to accounting call for substantial transformation and a greater variety of methods due to the concepts and methods borrowed from other branches of science and successfully adjusted to accounting. The author observes some trends of expanding the range of cross-subject relations of accounting, the increased number of research papers which are inter- and trans-disciplinary in character and researches partially applying the methods of other sciences as well as reduction or even extirpation of methodological dogmatism.

S. F. Lehenchuk (2006) defines synergy in accounting as capitalized intellectual expenses within the intellectual capital.

Therefore, the authors treat synergy as an increase of efficiency and acquisition of emergence of activity results due to combining separate parts into a single system.

The founder of synergism, Igor Ansoff (1989) proves that synergies can be substantiated by one of the three variables:

- 1) increased value for consumers and resulting increased sales;
- 2) reduced operating costs;
- 3) reduced needs of investments.

Escalation of one of these trends leads to changes in an enterprise's value: under the positive synergism the goodwill increases, while under the negative synergism, the cost of capital is also negative. These changes in transnational companies are calculated by means of a synergetic derivative balance sheet.

Synergism objects include such reorganizational processes as consolidation, division, reforming, liquidation, and structural and combinational components of an enterprise.

Synergy can result from the following combinations:

1. Combination accompanied by creation of a new object: $A+B=C$;
2. Combination without creating a new object or a merger/take-over as hostile acquisition; $A+B=A$;
3. Division of a firm into several entities: $A=B+C$;
4. A firm's withdrawal from a major company: $A=A+B$.

Fig. 1 demonstrates a suggested totality of various synergism types affecting an enterprise's development in the age of digitalization and economic globalization.

The origin of presented synergism types can be exemplified by interrelations of factors affecting an enterprise's development. The following types of synergism have an impact on an enterprise's development: management, sales, impact factors, factors of operation, investment and innovation. The mentioned factors are of great importance for achieving synergy. Synergy can be achieved by combining any components (elements, indicators) of factors influencing an enterprise's development.

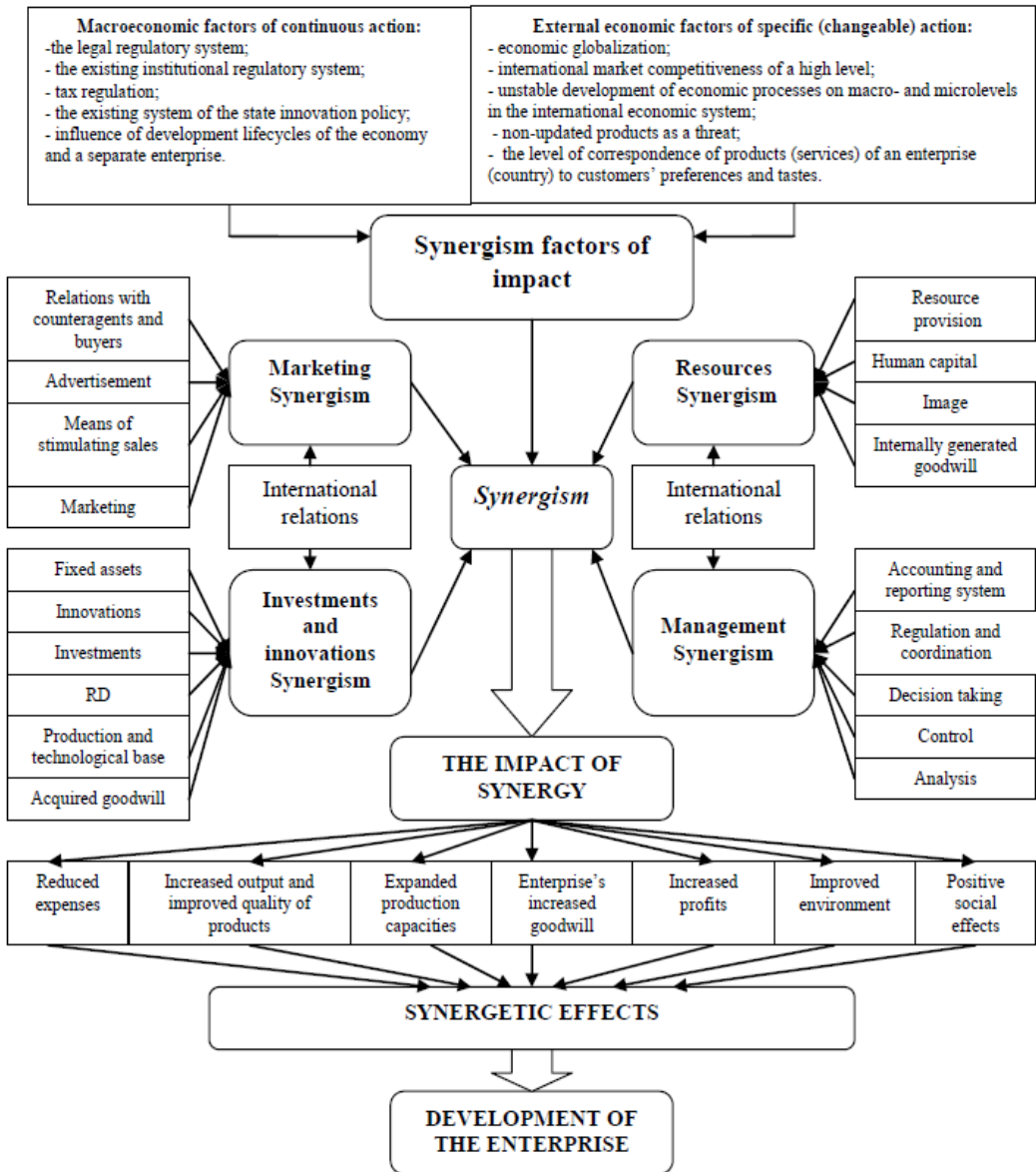


Fig. 1. Suggested classification of synergism and its influence on an enterprise's development in the age of digitalization and economic globalization

Notes: composed by the authors

Besides, it is recommended to supplement Ansoff's postulates by adding synergies based on one of the three basic trends that cause the increased enterprise's cost and increase their number up to seven. They include: 1) reducing expenses; 2) increasing quantity and improving quality of products; 3) it is difficult to agree with Ansoff's statement as to reducing the need of investments, as the latter, especially those in innovations, create a chain reaction in the form of geometrical progression, which cause more investments into company

development; 4) expanding production capacities; 5) increasing the enterprise's goodwill; 6) increasing profits; 7) improving the environment; 8) gaining social effects, etc. Development and implementation of the enterprise's strategy in the age of digitalization and economic globalization are intended to foster positive synergies and increase an economic entity's efficiency. The mentioned basic impact factors and opportunities of achieving a new investment-innovative level of an enterprise's development indicate that synergies will increase both in number and quality due to the systemic effect of emergence.

The primary goal of accounting in terms of synergetics is collection, acquisition, interpretation and reporting of high quality information on enterprise assets and liabilities in a complex system. In accordance with this, the ultimate objective of accounting is obtaining information on either positive or negative systemic actions on an enterprise and determining and assessing synergies. To perform this task effectively, it is essential to create a mutually agreed system of accounting, analysis, control and decision-making based on synergetic principles.

In order to manage a company with synergetic principles in view, it is necessary to assess, account and control the amount of synergies. Thus, there are suggested some basic stages of methods for synergies accounting and calculation:

1. Formation of initial information covering detailed quantitative and qualitative data on indicators affecting synergies and ways of their manifestation (purchase, merger, generation within an enterprise). The information is contained in budgeting data, summary calculations, strategic and tactic balance sheets and other managerial documents.

2. Analysis of various business-strategies and choice of the best development option for an enterprise.

3. Analysis of an enterprise's activity in accordance with classical directions: financial state, the micro- and macro-environment, expenses, profits, output, etc.

4. Analysis of internal interrelations between subdivisions and results of companies' purchase or merger. Managerial accountants and managers should determine correctly interrelations between subdivisions, reserves for development and forecast effects, special attention being put on goodwill and trademarks.

5. Choice of methods for assessing synergies within the accounting system. To perform this, situational planning should be applied to working out possible situational options and reflecting their results in managerial reports.

6. Recording hypothetical synergies. After implementing initial data, the computer system is to divide hypothetical synergies into detailed analytical and synthetic accounting calculations resulting in further accounting procedures which depend on their formation and operation modes. These operations can include purchase and merger of companies, reconstruction, etc.

7. Development of optimal schemes of connection among structural divisions on the basis of horizontal and vertical integration, supply, coordination and joint use of resources and obtainment of results.

8. Carrying out hypothetic accounting entries and designing budgeted balance sheets. Intermediate data enable managerial reports and balance sheets on hypothetical synergies based on detailed analytics. There arises an opportunity to reflect intermediate information on hypothetical synergies in the form of tables, graphs, bar charts, etc. It will facilitate obtainment of information on hypothetical synergies of different detail levels in their dynamics and interrelations, etc. Managerial accountants predict a hypothetical opportunity of selling companies' assets on the basis of dynamics methods of analysis.

9. Specifying real synergies through defining and comparing pure synergetic assets, pure synergetic liabilities, pure pro forma assets of input data and results. Output data provide for basic reporting indices of real synergies in accounting and managerial reporting on the basis of input and intermediate information. The complete reporting information is acquired to analyze and control an enterprise's development through controlling real synergies and considering a current situation.

10. Making efficient, tactic and strategic managerial decisions concerning impacts on a company's development.

Formation of coordinated data flows will ensure simultaneous satisfaction of a company's need in the appropriately controlled system of accounting, managerial accounting and authentic financial and statistic reporting.

Conclusions and suggestions

It is recommended to treat synergies as an increase of an effect, efficiency and emergence of an activity result due to merging of separate parts into a single system. To foster synergism of factors affecting an enterprise's development, the algorithm of automated accounting of synergies through accounting simulation is suggested. This would ensure simultaneous satisfaction of an enterprise's needs in appropriately controlled system of accounting, managerial accounting and authentic reporting. It is defined that to effectively manage an enterprise's development according to synergism principles it is necessary to assess, account and affect synergy volume in an efficient way. This can be achieved by introducing an account or a subaccount "Synergetic effect" with the following accounts "Positive synergy" and "Negative synergy". For this purpose, the national accounting system can apply accounts "Intangible assets" 12, "Long-term debit liability and other capital assets" 18, "Goodwill" 19, etc. It is also recommended to open a subaccount to reflect synergetic capital in the 4th class accounts "Equity capital and securing liabilities". Analytical accounts should reflect sums of synergies affecting an enterprise's development that are resulted from interaction of such factors as use of capacities, personnel's skills, managerial advantages, goodwill, intellectual capital, innovations, intangible assets in various combinations.

Further research should focus on determining synergies on the macroeconomic level of the state.

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