SINERGETIC AND COMPLEX EFFECTS OF BRANDING OF INTEGRATED BUSINESS STRUCTURES AND PROBLEMS OF MANAGEMENT

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Introduction and goal of the research. The main strategic goals of the integration of business structures is the formation of the values of the business unit, which is realized through the growth and capitalization of intangible assets, a special place among which is the brand. In the process of integration interaction there are effects of synergy and complementarity, which are caused by the principles of uncertainty, unpredictability and unbalance.

Research hypothesis. Branding, acting as an integral part of the integrated structure and the potential for complementary and synergistic effects, requires a scientific substantiation of the methodological foundations in the approaches to disclosing the essence of the effects of the merger as a whole.

The lack of fundamental and applied research on the sources of synergy in the process of branding in the integrated business structures system leads to a reassessment of the motives and cost of merger transactions.

The purpose of this article is to reveal the nature of the origin of the components of the overall effect of the merger of brands, in particular, the main ones: the effect of complementarity and synergy effect.

During preparing of the article, **methods** of scientific synthesis, synthesis, method of formalization and a systematic approach were used.

Results of the research. The article is devoted to the scientific substantiation of the methodological foundations in the approaches to disclosing the essence of synergistic and complementary effects that arise in the process of brand integration in the system of integrated business structures.

Conclusions. The basis for choosing a strategy for integrating business-style brands after mergers or acquisitions as an open and non-equilibrium system is the assessment of the integration phase, in which all brands of the integrated business structure are located. Such an estimation will allow using both qualitative and quantitative indicators of integration in statics and dynamics, allowing to take into account the correlation between the types of complementary and synergistic effects depending on the types of structure of the integrated brand.

Keywords: Branding, integrated business structure, complementary effect, synergistic effect, bifurcation.

Statement of the problem and its relevance. Globalization processes of world production and the development of large private property in Ukraine, form a new wave of activation of mergers and acquisitions. The main strategic goals of the integration of business structures is the formation of the value of the business unit, which is realized through the growth and capitalization of intangible assets, a special place among which occupies the brand.

In the process of integration interaction there are effects of synergy and complementarity, which are caused by the principles of uncertainty, unpredictability and non-equilibrium. The greatest potential of synergy is internal subsystems of the integrated business structure, because it is through them that the transition of the system to the state of bifurcation occurs. Thus, branding, acting as an integral part of the integrated system and the potential for complementary and synergistic effects, requires a scientific substantiation of the methodological foundations in the approaches to disclosing the essence of the effects of the merger as a whole.

Analysis of research and publications. In the scientific literature, separate questions of research on the sources of synergy and complementarity are considered from the point of view of mergers and acquisitions of corporations (D. Depamfilis [2], S. M. Ishchenko [3], I. P. Lapshin [5], V. M. Marchenko [6], A. A. Myasnikov [8] and others).

Unresolved earlier parts of the overall problem. Issues of synergy and complementarity in the process of brand integration are poorly understood, and require further research.

The goal of the research. The lack of fundamental and applied research of the sources of synergy in the process of branding in the integrated business structures system leads to a reassessment of the motives and cost of merger transactions. The purpose of this article is to reveal the nature of the origin of the components of the overall effect of the merger of brands, in particular, the main ones: the effect of complementarity and synergy effect.

The main results of the research. Approaching the consideration of the essence of the effects that arise in the process of integration, attention should be paid to the synergistic and complementary effects of branding of integrated business structures. In accordance with the synergetic concept, the synergetic effect is considered through the prism of two postulates:

1) Probability of internal self-organization of system elements;

2) The probability of self-organization of this system with other systems (consumers, society, competitors etc.).

The development of an integrated business structure is a model of long-term actions, the development and implementation of which is aimed at achieving the goals. Thus, the development of the structure that is in the process of association is described in three ways: either the integrated business structure is considered as a complex mechanistic system, or as a system that can evolve through integration, or as a system based on the operation of which the concept of self-organization (synergetics).

Characteristic features are: cooperative action of components (including branding), forming a system; Unbalanced state supported by internal factors; the nonlinearity of the process that occurs during development and is described by the levels of the second and third degrees; the presence of certain restrictions on the process of self-organization. It should be noted that from the standpoint of the synergetic approach to the integrated business structure, as an open economic system, characteristics such as the possibility of self-regulation, openness and non-equilibrium are characteristic.

With such a vision of the essence of synergy, self-organization acts as a new form, structure, the likelihood of interaction between elements of a structure that arose as a result of the integration of two or more business units and which could not be created by the efforts of only one business unit. So, in our opinion, the main idea of branding of integrated business structures is that business entities can not achieve the relevant (maximum) results unless they are participants in the system of integrated business structures. Synergistic effect, the initiation of which is due to the very essence of the integration of brands mathematically can be defined as follows:

$$f(x1, ..., xn) = f(x1) + ... + f(xn) + S(x1, ..., xn), \qquad (1)$$

f – Integral function, which is an indicator of the business activities of the brands as a whole;

$x1, ..., xn$ – Independent business entities (brands) as part of the integrated business structures;

$S(x1, ..., xn)$ – Synergistic effect of joint activity $x1, ..., xn$.

In this regard, the problem of branding in the system of integrated business structures is defined as finding $f(x1, ..., xn) \rightarrow max$ by selecting components of an integrated business structure $x1, ..., xn$ dnd build between them such interconnections that can be achieved by $S(x1, ..., xn) \rightarrow max$.

The synergistic effect of S on branding in the system of integrated business structures arises precisely as a result of the joint activity of individual brands of business structures $x1, ..., xn$, and part of it belongs directly to the subjects (separate brands), and the other part – the branding of the integrated business structures in general. You can consider this $S(x1, ..., xn)$ through:

$$S(x1, ..., xn) = s(x1) + ... + s(xn) + s(x1, ..., xn), \qquad (2)$$

$S(x1) + ... + S(xn)$ – Parts of the synergistic effect that arise in subjects (brands) $x1, ..., xn$;

$S(x1, ..., xn)$ – Part of the synergistic effect that is achieved in general.

Thus, we can assume that the effect is distributed appropriately between business participants and allows them (and the structure as a whole) to achieve indicators that are not achievable in self-employment. This effect is more attractive than relative independence of brands outside the system of integrated business structures, since the consolidation of the resource base, including, generates a positive balance of transaction costs. When evaluating the effect and its distribution, the indicator of the subject's activity becomes a new function *f(xi)*, which takes into account the share of synergistic effect:

$$f'(xi) = f(xi) + s(xi). \tag{3}$$

The overall assessment of the activity then looks as follows:

$$f(x1, ..., xn) = f(x1) + ... + f(xn) + S(x1, ..., xn) =$$
$$= F(x1) + ... + f(xn) + s(x1) + ... + s(xn) + s(x1, ..., xn) = \tag{4}$$
$$= F'(x1) + ... + f'(xn) + s(x1, ..., xn).$$

Thus, if an integrated business structure exists as a set of entities (brands) with different owners (or shares of owners), then the question arises about the mechanisms for fair separation of the synergistic effect between the parties. If the integrated business structure is a product of restructuring a single company, then the entire synergistic effect belongs to one owner or a group of owners regardless of which brands themselves have been able to obtain a synergistic effect. Thus, branding in the system of integrated business structures creates opportunities for the emergence of a systemic effect and its use.

The complementary effect, unlike synergy, is the predictable result of an organized process, which manifests itself mainly through savings and acquired benefits as a result of volume changes, production structure, management structure, etc. Savings serves as the expected result of combining and complementing the resources of business units as a result of their consolidation. In particular, speaking about the complementary effect of integration, it is possible to distinguish several levels of its occurrence: the effect of pooling resources, the effect of the combination of capacities, the effect of combining financial flows, the effect of marketing, the effect of substitution (investment), the effect of centralization etc. [6, 7].

The complementary effect of branding of integrated business structures is manifested through the savings of marketing costs, changing market share, changing competitive positions, the effect of complementarity, diversification, and changing the size of brand equity.

At each of the levels of the emergence of the complementary effect is possible, but not guaranteed appearance and synergistic effect. In the study of the essence of manifestations of complementary and synergistic types of branding effects of integrated business structures, the type of structure of an integrated brand should also be taken into account. The correlation between the types of complementary and synergistic effects, with taking into account the types of structure of the integrated brand is presented in Table 1.

Table 1

Value of types of complementary and synergistic effect, with taking into account the types of structure of the integrated brand

Type of structure of the integrated brand	Complementary effect: the one that is predetermined, predicted, accurately measured	Synergistic effect (attractor): unpredictable, poorly measurable, result of randomness
Matrix structure of the integrated brand	Savings in marketing expenses	New terms of cooperation New knowledge Change in market conditions Branding innovations
Cluster structure of the integrated brand	Savings in marketing expenses	Competitive-integration benchmarking New knowledge New corporate culture
Circular structure of the integrated brand	Change the market share Change in competitive positions	Change the market value of the integrated structure Image
Holding structure of the integrated brand	The effect of complementarity Diversification Change in the size of the brand equity	Change in market conditions New development opportunities Getting a new experience New brand management quality
Linear structure of the integrated brand	Savings in marketing expenses Change of the organizational structure of brand management	Change in market conditions Competitive integration benchmarking
Integrated brand integration structure	The effect of complementarity Change in the size of the brand equity	Change the market value of the integrated structure Image

Hence, effective branding in the integrated structures system is a perfect state to which each group of interacting brands of business units should seek, regardless of their scope and scale. In practice, this is achieved by the independence of each of the subjects responsible for the indicators of their branding activities and capable of independent development. This means that each business unit is able to effectively use within itself a centralized brand management model.

At the same time, the integrated business structure generally follows the decentralized brand management system in terms of strategic brand development, brand value assessment, customer loyalty, marketing budget definition, resource allocation, brand portfolio assessment and optimization, and periodicity of brand equity management research.

In general, the process of developing an integrated business structure as an open economic system can be regarded as an unlimited sequence of self-organization processes. The dynamics are such that, under the influence of changes occurring in the internal environment and the actions of destabilizing factors of the environment, there is a loss of stability of the system, which until then was in an unbalanced state [3]. These changes "trigger" the spiral process, where each turn of this spiral represents a new high-quality self-organized economic system that generates a new ordered structure. Upon completion of this process of self-organization, the system again becomes a new equilibrium state.

Such evolutionary spiral cycles of the development of economic systems, at first glance, may look relatively similar, but by their nature, they qualitatively differ. Each of the large cycles of self-organization of the system is a partial (that is, disproportionate) sum of small cycles. Moreover, in their size, they differ not only in terms of the effect of changes occurring, but also on the criteria of qualitative and quantitative transformations, which allows to find out (instability) from any position, and each of these leads to a new cycle of self-organization. Therefore, each large cycle thanks to its spiral structure raises the system to a new, in a sense, higher, evolutionary plane, characterized by a new level of integration of the business structure. Major cycles of the spiral process of integration of business structures as an economic system are characterized by such basic characteristics as irreversibility, randomness, nonlinearity and uncertainty, embodied in the corresponding principles of management.

According to the phases of integration of brands of business units, these principles need to be clarified:

1. The irreversibility in the integration process is explained by the existence of the so-called point of bifurcation (the critical point), to which the effect of destabilizing factors of the environment does not cause significant changes in the state of equilibrium of the system, after which there may be several directions (possibilities) of further evolution.

2. At the bifurcation point, the control variable reaches a critical value, after which the system proceeds from the state of equilibrium [5]. From this moment in the system there is a "choice" in which there is an element of chance, which leads to the impossibility of predicting the further development of the system. Bifurcation – the term comes from lats. Bifurcus – "bifurcated" and is used in the sense that there are qualitative alterations or metamorphoses of integration components when changing the parameters on which they depend.

3. "Point of bifurcation" means a crisis moment when it is necessary to choose a principal managerial decision. After making this decision, a process that has a nonlinear character can go towards a "crisis", then in this phase of the life cycle, the business unit will be unable to independently move into the "life-cycle" of growth through internal capacity resources, without additional resources outside or reorganization. The brand management of the integrated business structure is a cascade of bifurcations (period doubling scenario) as one of the typical transition scenarios from a simple periodic regime to a complex aperiodic period with an infinite doubling period. Such a sequence of transition from one phase of integration to another has a self-similar, fractal structure – an increase in any region reveals the similarity of the selected area in the entire structure. Fractal (lat. Fractus – crushed, broken) – the term, which means the system (in our case, the segment is understood as a component of the stabilization phase), which has the property of self-similarity, that consists of several parts, each of which is similar to the entire system. In the study of the integration of brands under fractals, we must understand the set of points in the Euclidean space having a fractional metric dimension. The change of the possible dynamic regimes of the brand management system of the integrated structure of the equilibrium states of stationary points occurs when the value of the bifurcation parameter is changed. In the proposed model (Figure 1), the "Brand Capital" parameter (OZ axis) is chosen as a bifurcation parameter. Typically, steady modes display a solid line, and unstable – dotted.

4. The analysis of the mechanisms of transition to a new state of integration in real systems and different models has shown the universality of relatively few transition scenarios. The transition to a new state of integration can be represented as a bifurcation diagram, which reflects the uncertainty of qualitative system rearrangements with the emergence of a new mode of its behavior. The introduction of a brand management system for integrated business structures in an unpredictable mode is described by a cascade of bifurcations, following one after another. The cascade of bifurcations leads consistently until the choice between two solutions, then four, and so on.

The system begins to hesitate in the mode of successive doubling (quantity) of possible values. To enable such a process of self-organization, the system must be open. If the system during the study turns out to be closed, it eventually would have come to a state with maximum entropy and stopped any evolution [1, 9].

An open system is always far enough away from the point of integration equilibrium, in which the complex system has the maximum entropy and is not capable of any self-organization. In a position close to equilibrium, any system will be over time even more close to equilibrium and be able to change its state. This interval corresponds to the phase of the complementary effect of the branding of the integrated business structures. A schematic diagram of a synergistic and complementary approach to the brand management process of integrated business structures as an open and non-equilibrium system is given in Figure 1.

By the criterion of choosing a managerial decision to achieve the target level of complementary and synergistic effects, it is suggested to use an indicator of the ability to achieve the planned level of brand integration (IB).

The model of the ability to achieve the planned level of integration of brands IB business structure for a certain period of time is as follows:

$$\frac{\sum(\sum(BC_t \cdot P_{внедр.} \cdot P_{рес.})}{\Delta_{IB} + \Delta_{цi}} = 1, \tag{5}$$

BCt – need to increase the level of management activity (integral indicator of the efficiency of brand equity in time); $P_{впров}$ – the probability of introducing the proposed strategy of brand integration; $P_{рес.}$ – the security needed to implement the proposed strategy of integration with resources; Δ_{IB} – The difference between the initial level of brand integration and the target; $\Delta цi$ – the opportunity to change for achieving the target (i) level of integration.

The provision of the necessary resources for the implementation of the proposed strategy is calculated as follows:

$$P_{рес.} = \frac{P_{фак.}}{P_н}, \tag{6}$$

$P_{фак.}$ – Actual provision of resources; $P_н$ – Normative or desirable amount of resources.
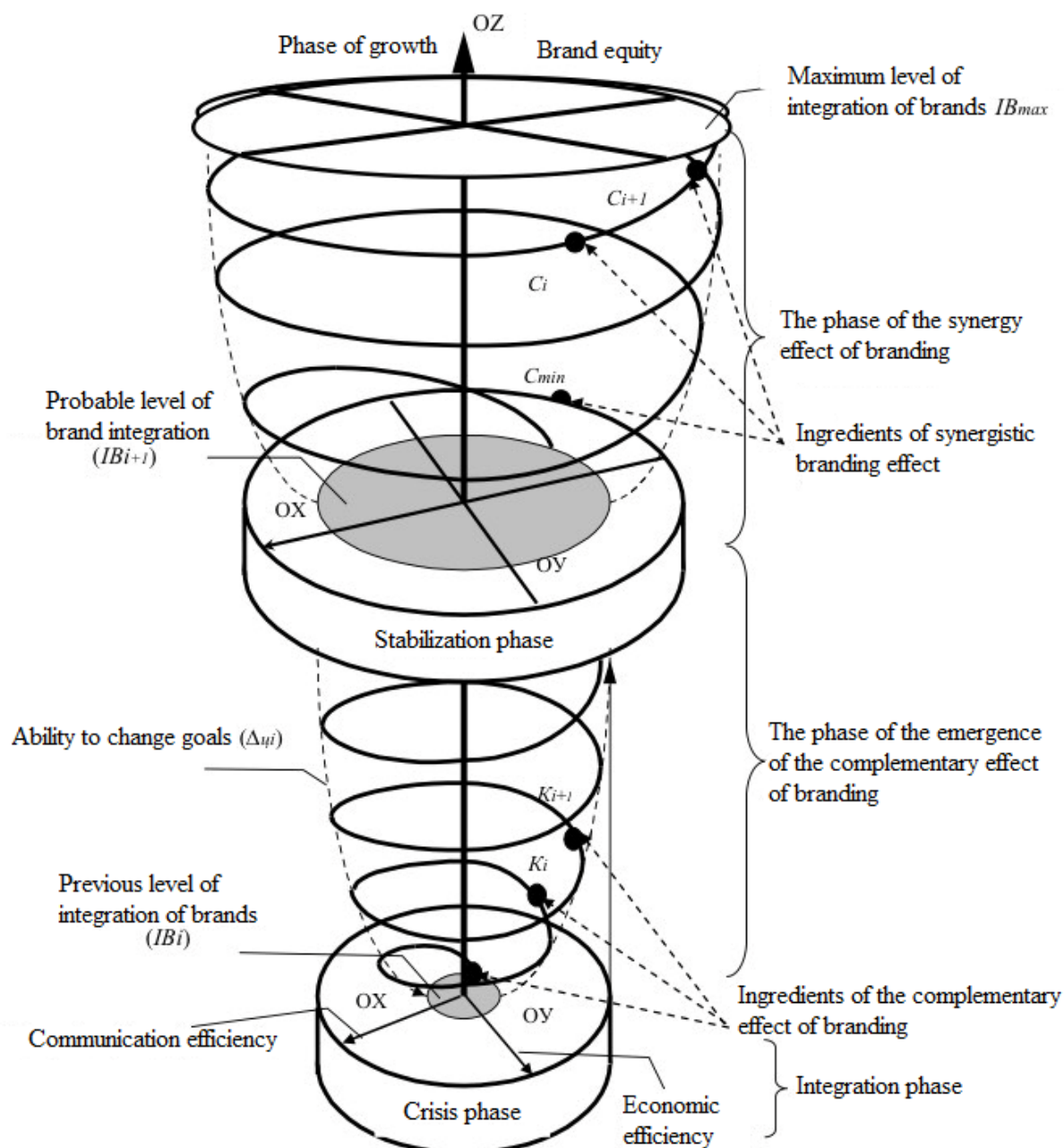
Figure 1. **Principal scheme of synergistic and complementary approach to increase the level of integration of brands of business structures**

Symbols on Figure 1:

Ki and $Ki+1$ – Components of the complementary effect of the n brand in this phase of integration in t and t + 1 moment of time;

Ci and $Ci+1$ – Components of the synergistic effect of the n brand in this phase of integration in t and t + 1 moment of time;

$IBmax$ – The maximum possible level of brand integration;

OX (Communication efficiency (KE)), $OУ$ (economic efficiency (EE)), OZ (Brand equity (БК) – Coordinates of the volume matrix of the integration of brands of the business structure.

The difference between the initial level of integration of brands and the target is equal to:

$$\Delta_{IB} = \text{IB ц.} - \text{IB нач.} \tag{7}$$

IB ц. – The target value of the integration of brands of the business structure;

IB нач. – The initial value of the indicator of brands of the business structure integration.

According to formula (5): if the equation of the unit is achieved – it is possible to achieve the goal, if more than one – the achievement of the target level of brand integration is highly probable, if below one – it is not possible.

By the same method, trajectories of components and components of the integration of brands of the business structure are constructed.

The basis for choosing a strategy for integrating business-style brands after mergers or acquisitions as an open and non-equilibrium system is the assessment of the integration phase, in which all brands of the integrated business structure are located. Such an assessment is carried out using both qualitative and quantitative indicators of integration in statics and dynamics. Similar matrices are constructed as follows: based on the existing sample of a group of brands of the business structure under investigation, average values are determined based on indicators that comprehensively assess their integration – КЕ, ЕЕ, and БК. Then, the brands of the integrated business structures are divided into three groups: 1) those having the mentioned values above the average (КЕ, ЕЕ and БК), 2) those with averages (КЕ, ЕЕ, and БК), and 3) below the average (КЕ, ЕЕ, and БК).

Brands of the integrated business structure, which are important for all indicators above the average, are assigned the value of "1", the average – "0.5", and lower than the average – "0".

At the intersection of three scales (horizontal and vertical) values are written corresponding to the values of complex indicators "1", "0,5" or "0". At КЕ, ЕЕ and БК, which are equal to "1", a qualitative assessment of the IB is considered as a "high" level. If at least one of the values of the complex indicators of the КС, КЕ, ЕЕ and БК is equal to "0", the qualitative assessment is considered "normal", with two estimates, which are "0" – "average", and with three – "low".

Conclusions. Based on the above conclusions, depending on the phase of integration of the brands identified at the previous stage (low level of integration – the phase of crisis, the average level of integration – the stabilization phase (confirmed by the presence of a complementary effect of internal and external interaction), high level of integration – the phase of growth (confirmed by the presence of synergistic effect of internal and external self-organization)), integrated business structures can be divided into two groups: adaptive and dissipative.

Dissipative – it is such a stable state that arises in a non-equilibrium environment under the condition of dissipation (scattering) of resources coming from outside. A dissipative system can be called a stationary open system or a non-equilibrium open system. Therefore, in our opinion, a system that has an average level of brand integration should be considered dissipative.

Adaptability of the brand management system of the integrated business structure is determined by its ability to perform specified functions effectively in a certain range of changing conditions. The wider this range, the more adaptive the system is. The stage of internal and external self-organization occurs only in the case of the predominance of positive feedback, operating in an open system, over negative feedback. Therefore, a system that has a low level of brand integration should be classified as an adaptive group with a predominance of negative feedback; A system with a high level of brand integration – to adaptive with the prevalence of positive feedback. The division into three areas of the predominant influence on the level of brand integration by the means of adaptability – dissipative forces to offer for each of the zones a portfolio of appropriate measures to achieve a potential attractor of development in order to increase the level of integration of brands business structure.

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