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Actual Research Problems in Eastern Europe

editors
Małgorzata Plechawska-Wójcik
Olena Shatilova

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Table of contents

Introduction

A new competitive environment is developing largely based on the current technological revolution and increasing globalization. The business environment has altered rapidly and unpredictably, and new knowledge and capabilities are consequently needed to survive in such a turbulent environment.

In short, the new decade demands methods of making decisions and managing organizations that allow executives to work with uncertainty rather than denying or ignoring it. This is a time of complex possibilities, and the best approach is to address that reality.

However, this monograph goes on to propose a new way of thinking about information processing in uncertain environment.

The aim of this monograph is to review the development of contemporary management theory with the goal of providing a succinct summary of the key concepts, principles and paradigms present in this field of study in Eastern Europe.

This monograph enclose such important points of actual research problems, as forecasting and enterprise strategic flexibility in uncertain environment, the decision-making process of small and medium business, enterprise restructuring and evaluation, international business structures choice and optimization, risk-management and economic, social and labour aspects of enterprise relations.

We would like to wish to thank ours authors and reviewers for their valuable ideas and insightful comments during the development and writing of this monograph. We also would like to thank many of the people who contributed to this book.

We hope for continuation of our fruitful cooperation.

Olena Shatilova
Małgorzata Plechawska-Wojcik
Editors

1

ENTERPRISE STRATEGIC FLEXIBILITY: THE NATURE AND METHODOLOGY OF ASSESSMENT

The issues of the day of management are considered enterprises in the conditions of unstably external environment. This article develops the concept of enterprise strategic flexibility. It begins with a review of the historical perspectives of strategic flexibility. An application of management that based upon the leading principle of the flexibility has been reasoned and conceptual framework of enterprise strategic flexibility management has been elaborated. In addition, the method of enterprise strategic flexibility and its profile assessment has been offered.

1.1. INTRODUCTION

Over decades, the business environment has changed dramatically and is affected by the changing environmental factors. Ansoff and Sullivan argue that the changing environmental turbulence factors, such as complexity of event, familiarity of event, rapidity of change and visibility of future, will result different levels of the environmental turbulence [2]. Current condition of the new business competitive landscapes shows that environmental is in the highest level, which is full of surprises. In this level, the familiarity of events are discontinuous novel, the rapidly of change are much faster than firm`s response and visibility of future are unpredictable surprises. Furthermore, the characteristics of high environmental turbulence, such as unpredictability, complexity and uncertainty, exist as dynamic environment result that is characterized by high level of dynamism, which shows positive and non-linear feedback. It forces the decision makers to work harder to predict changes and prepare their corresponding strategies to compete with their competitors to gain the market share.

Faced with unrelenting complexity, companies must use and develop new strategies and new ways of organizing to deal with this exceedingly complicated landscape. It requires that they use the latest technology, continue to develop new technology, actively

participate in global markets, structure themselves to gain advantage in these markets, build a long term vision that allows managers to balance short term performance with long term needs, develop and maintain strategic flexibility.

The concept of strategic flexibility is not new. It appears in the management literature as early as the 1950s. However, in the decades since, the concept has been defined in numerous ways and has become shrouded in vagaries and ambiguity.

The next few pages we give consideration to concept of strategic flexibility in more detail. The paper is structured as follows. In section two, the literature on strategic flexibility is reviewed. In section three these findings are put in a conceptual framework that we use in the exploratory case study research. In section four, the research methodology is discussed. In section five, the case study data and its analysis is presented. In the final section of the article, we offer a discussion of implications and concluding comments.

1.2.   LITERATURE REVIEW ON STRATEGIC FLEXIBILITY

The concept of strategic flexibility is manifest in several disciplines, such as strategic management, organization theory, economics, and marketing (Genus, 1995). It is not surprising, therefore, that a reasonably diverse array of definitions exist in the literature across disciplines.

A review of the literature on flexibility reveals a distinction between operational, tactical and strategic flexibility [4, 6, 7, 15]. Operation flexibility is short-term flexibility pertaining to day-to-day operations [10, 23, 25]. It involves the ability to deal with short-term fluctuation in demand, raw material shortage, or equipment failure [7]; complexity of the production process caused by manufacturing a variety of products [25]; and the implementation of new products or technology in the manufacturing process [10]. Operational flexibility is therefore a determinant of the speed and cost of response, reinvestment, and degree of interruption in the existing system [23]. Improvisation arises from operational flexibility. Improvisation implies that planning and implementation of marketing actions coincide [21]. A high level of operational flexibility enables a firm to shorten the time between planning and implementation through quick adjustment and thereby enhances the company`s ability to improvise.

A second perspective on flexibility that appears in the literature is tactical flexibility. Tactical flexibility pertains to change in the product design and in the product mix, the rate of production or equipment use [7] in response to fluctuations in demand or market imperfections [14, 24].

Strategic flexibility, a third aspect of flexibility found in the literature, involves the creation, maintenance, and realization of options for a company`s future [5, 18, 26]. Extant definitions often suggest that the concept of strategic flexibility pivots on the ability to take some action in response to environmental changes [5, 9]. Thus, strategic flexibility can be viewed as a capability [1, 3, 8, 12, 20].

1.3. STRATEGIC FLEXIBILITY: THE NATURE OF CATEGORY

Although the definitions of strategic flexibility vary from researcher to researcher, they are not markedly different. In Table 1.1, we provide an overview of existing conceptualizations and definitions. Table 1.1 demonstrates the scope of research on strategic flexibility.

Table 1.1 Conceptualizations and Definitions of Strategic Flexibility

Author	Definition
Aaker and Macarenhas (1984) [1]	The ability of the organization to adapt to substantial, uncertain and fast-occurring environmental changes that have meaningful impact on the organic performance (p. 74).
Harrigan (1985) [13]	The ability of firms to reposition themselves in a market, change their game plans, or dismantle their current strategies when the customers they serve are no longer as attractive as they once were (p. 1).
Galbraith (1990) [10]	The ability to shift or replicate core manufacturing technologies quickly and effectively between different facilities, both domestically and internationally (p. 56).
Evans (1991) [9]	Capability to modify strategies (p. 77).
Bahrami (1992) [3]	The ability to precipitate intentional changes, to continuously respond to unanticipated changes, and the ability to adjust to unexpected consequences of predictable changes (p. 36).
Das and Elango (1995) [8]	The ability of an organization to respond to change in the environment in a timely and appropriate manner with due regard to competitive forces in the environment (p. 62).
Sanches (1995) [22]	Firm abilities to respond to various demand from dynamic competitive environments (p. 138).
Buckley and Casson (1998) [6]	Ability to reallocate resources quickly and smoothly in response to change (p. 23).
Hitt, Keats, De Marie (1998) [16]	The capability of the firm to proact or respond quickly to changing competitive conditions and thereby develop and/or maintain competitive advantage (p. 27).
Matusik and Hill (1998) [20]	A firm`s ability to respond quickly to changing market conditions (p. 682).
Young-Ybarra and Wiersema (1999) [27]	The flexibility to modify the alliance and flexibility to exit the alliance relationship when the alliance is performing poorly (p. 440).

Johnson, Lee, Saini and Grohman (2003) [17]	The firm`s intent and capabilities to generate firm-specific real options for the configuration and reconfiguration of appreciably superior customer value propositions (p. 77).
Mac Kinnon, Grant and Cray (2008) [19]	The firm`s deliberately crafted ability to recognize, assess, and act to mitigate threats and exploit opportunities in a dynamically competitive environment (p. 1).
Li, Su and Liu (2010) [18]	The firm`s capability to effectively and efficiently integrate and deploy internal and external resources by exploring ways to create greater value, and rapidly obtain extraordinary benefit and competitive advantage in an uncertain environment (p. 302).

In sum, our review of the flexibility literature suggested two important conclusions. First, extant conceptualizations rarely if ever consider strategic marketing perspectives or incorporate market-linking strategies and issues. Second, with very few exceptions, extant conceptualizations cast flexibility exclusively as reactive or responsive. While the notions of reaction and response to change are certainly important, flexibility is not limited to this. According to definitions in a number of dictionaries, flexibility means being capable of variation or modification, suggesting that it is much more than an ability to respond or react. In other words, some external happenings, factors, or issue is not necessarily required to drive or evoke it. Thus, we suggest a conceptual refinement of strategic flexibility that incorporates both proactive and responsive perspectives, and offer a modified definition:

Strategic flexibility is the enterprise ability for efficient variations of its goals that is based on permanent readiness to foresee and provides prompt change of business directions set aimed at quick adaptation to the market needs.

We believe this definition represents an accurate synthesis of current definitions while adding an important factor, that of deliberateness.

1.4. CONCEPTUAL FRAMEWORK OF ENTERPRISE STRATEGIC FLEXIBILITY MANAGEMENT

Transition to flexible and, thus, more reliable as to achieving goals systems is objectively necessary. The significance of this reconstruction will increase along with the enhancement of enterprise dependence on the external environment, abilities of its internal potential to respond to this transformation. In the meantime, the development of production potential and management flexibility is in increasing demand.

Taking into account the above-mentioned, we consider that the primary task for the enterprise is to adapt to the external environment without ignoring the importance of internal environment. It will become apparent when applying a concept of enterprise strategic flexibility management.

The concept of enterprise strategic flexibility management is a system of methodology-theoretical views on understanding and defining the essence, contents, goals, criteria and methods of enterprise strategic flexibility management.

The principal purposes of enterprise strategic flexibility management are as follows: ensuring necessary conditions for prompt adaptation of the enterprise to strategic course change; minimizing risks; maximizing the efficiency and competency of goods and enterprise as a whole.

The basic component of enterprise strategic flexibility management system is management personnel performing necessary functions by means of corresponding tools. The formal feature of the basic component of enterprise strategic flexibility management system is its profile beyond which it is impossible to achieve the system goals.

We consider a profile of enterprise strategic flexibility as a combination of basic, typical components characterizing enterprise flexibility. The components include production flexibility, economic flexibility, financial flexibility, motivation flexibility etc. Besides, the profile of enterprise strategic flexibility reflects the degree of arranging enterprise strategic flexibility management system.

When considering enterprise strategic flexibility management, it is necessary to distinguish object, subject and processes of enterprise strategic flexibility management.

The object of enterprise strategic flexibility management is a system of the coordinated enterprise goals that provides prompt change of business directions aimed at quick adaptation to operation environment.

The subject of management, a person directing management activities, performs strategic flexibility management functions. The subject includes managers of the highest management level.

The process of enterprise strategic flexibility management is a certain combination of the cyclic management activities which comprise detecting problems, searching and making decisions to provide predetermined enterprise goals. The process consists of 4 stages: defining mission, goals and tasks of the enterprise; forecasting tendencies of the target market development and assessing the profile of enterprise strategic flexibility; developing strategic activity; adjusting enterprise strategic course (figure 1.1).

The first stage of enterprise strategic flexibility management includes defining mission, goals and tasks of the enterprise.

At the second stage of strategic flexibility management considerable attention should be given to assessing internal and external factors. At this stage the principal focus should be aimed at forecasting the target market tendencies and assessing enterprise strategic flexibility profile.

The third stage of enterprise strategic flexibility management includes development of strategic activity relying on the performed assessment of enterprise strategic flexibility profile. First of all, strategic measures should be directed at removing weaknesses of the enterprise to attain the mission and strategic goals on the basis of response to the changes in the functional environment and result in balancing business directions of the enterprise.

The fourth stage of enterprise strategic flexibility management is adjusting strategic course of the enterprise that is realized by optimizing business directions due to the enterprise general strategic course optimization determined by strategic goals as well as

mission. This results in effective response to the changes in the functional environment in short- and long-term outlook and provides high degree of strategic flexibility during the period of these changes.
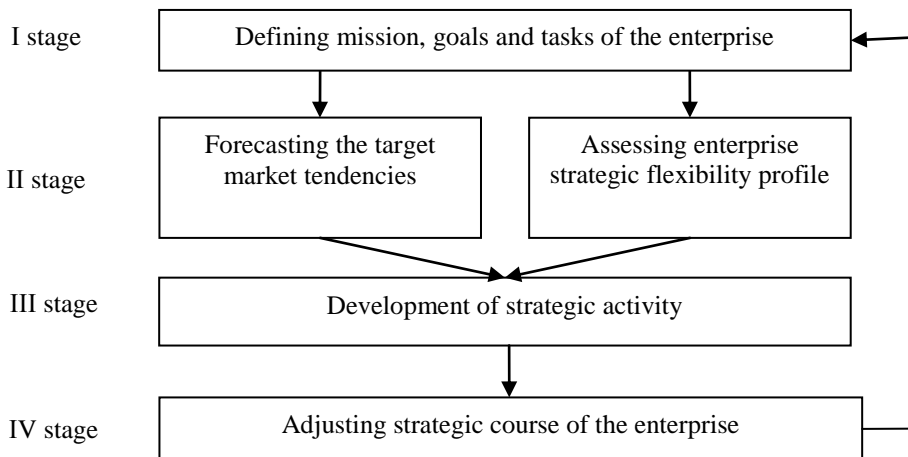
Fig. 1.1. Stages of enterprise strategic flexibility management
Source: own work

On the basis of analyzing the above-mentioned stages of enterprise strategic flexibility management it is necessary to elaborate a procedure of management that includes measures aimed at assessing enterprise flexibility profile, comparing characteristics with competitors' ones, elaborating strategic measures and adjusting strategic course for providing high degree of enterprise strategic flexibility. In the meantime, the main results of efficient implementing the above-mentioned stages into enterprise strategic flexibility management should be as follows: optimization of expenses for exercising strategic and day-to-day enterprise management; minimization of the risks caused by uncontrolled factors of an external environment; prompt response to changes in external and internal environments; avoiding problems due to strategic unpredictable situations which may lead to forced restructuring or bankruptcy; ability to provide efficient innovative activity on the basis of foreseeing new technology tendencies.

1.5.   ASSESSMENT OF ENTERPRISE STRATEGIC FLEXIBILITY

We believe that for assessing enterprise strategic flexibility profile it is necessary to use complex integral index that would include various characteristics of enterprise activity. For this calculation it is possible to use an approach based on the priorities distribution method (method "SMART") [12, c.156]. The method is one of well-known

heuristic ones. It was introduced by E. Edwards and applies simple procedures of acquiring information with further aggregation into general assessment of alternative.

Accordingly, the procedure of assessing enterprise strategic flexibility consists of the following stages:

1. Defining and ordering the most significant criteria of assessing enterprise strategic flexibility. In this case, the criteria include factors of internal flexibility (financial, technical, technological, organizational, operative, innovative, informational and managerial components etc.).

2. Defining actual weighted values of each enterprise flexibility partial index of i-type (f_i^n) on the basis of the pre-determined criteria of assessing enterprise strategic flexibility. The formula of calculation is presented in eq. 1.1:

$$f_i^n = \frac{m}{K_{max}} \times K_i \tag{1.1}$$

   m – index significance level;
   Ki – value of partial index;
   Kmax – maximum results value of index.

3. Defining the degree of each i-type of enterprise flexibility which is calculated by using the formula presented in eq. 1.2:.

$$F_i = \varphi(f_i^n; \alpha_i) = \sum_{i=1}^{n} f_i^n \times \alpha_i + \Delta_i \tag{1.2}$$

   fin - weighted actual value of enterprise flexibility partial index of i-type;
   бi – weight of enterprise flexibility partial index of i-type;
   Δi – error.

   It should be noted that the significance of the partial indices, produced into complex index, is defined according to the degree of their influence on enterprise activity when applying the method of expert evaluations.

   While examining the level of partial indices influence, it is necessary to apply the method of stochastic factor analysis since it visually reflects real expected changes of the result caused by change of the parameter examined. This approach to constructing the model of correlation among separate factors and their result is based upon generalizing the variation patterns of the factors quantitative characteristics and results of activity.

4. Estimation of enterprise flexibility using the following functional dependence (eq. 1.3):

$$SF = \varphi(F_i; \alpha_j) = \sum_{i=1}^{n} F_i \times \alpha_i + \Delta_j \tag{1.3}$$

   Fi –weighted actual value of enterprise flexibility index of i-type;

бj - weight of enterprise flexibility partial index of i-type;
Δi - error.

Considering the above-mentioned it is possible to propose the algorithm of enterprise strategic flexibility assessment (Fig. 1.2).

Defining and ordering the most significant criteria of assessing enterprise strategic flexibility

Defining actual values of each enterprise flexibility partial index of *i*-type

$$f_i^n = \frac{m}{K_{\max \square}} \times K_i$$

Defining the weight of enterprise flexibility partial index of i-type

α_i

Defining the degree of each i-type of enterprise flexibility

$$F_i = \varphi\left(f_i^n; \alpha_i\right) = \sum^n f_i^n \times \alpha_i + \Delta_i$$

Defining the weight of each i-type of enterprise flexibility

a_j

Estimation of enterprise strategic flexibility

$$SF = \varphi\left(F_i; \alpha_j\right) = \sum_{i=1}^n F_i \times \alpha_i + \Delta_j$$

Building up enterprise strategic flexibility profile

Fig. 1.2 Algorithm of enterprise strategic flexibility assessment
Source: own work

Interpreting the calculated integral index of enterprise strategic flexibility level will facilitate estimation of the current state as well as elaboration of the scientifically substantiated strategy of enterprise development. So, according to the assessment results we can distinguish four ranges covering the value of strategic flexibility level that

characterizes strategic position of the enterprise. On the basis of these assumptions we suggest the scale for defining the level of enterprise strategic flexibility and corresponding measures in the strategic planning system (table 1.2).

Table 1.2 Scale for defining the level of enterprise strategic flexibility and corresponding measures in the strategic planning system

Level of strategic flexibility	Strategic position	Position characteristic	Corresponding measures in the system of strategic management
0,75 - 1,0	Stable competitive position	Favorable situation, negative influence of external factors is minimum	Predicate management
0,5 – 0,75	Alternative strategic position	Negative influence of external factors is apparent, enterprise potential equals or slightly exceeds the influence of destabilizing factors	Optimizations of business directions set
0,25 - 0,5	On the verge of losing stability	Power of destabilizing factors is twice as big as enterprise potential	Reorientation of activity
0 – 0,25	Loss of stability	Power of destabilizing factors is significant, the enterprise faces extreme and nonstandard situation	Enterprise restructuring

Organizational measures and managerial tools in the system of strategic management concerning a certain limit of enterprise strategic flexibility should be arranged to provide the economic stability of the enterprise. It is necessary to direct strategic measures at reducing the period of restoring equilibrium state of the enterprise. According to the proposed scale of defining enterprise strategic flexibility limit, with the stability level within $[0,5 – 0,75]$ and $[0,75 – 1,0]$, the probability of loosing equilibrium state is minimum and, therefore, the management is aimed at ensuring the stable development of the enterprise and avoiding crisis situation. In the meantime, in the system of strategic management it is possible to foresee such standard measures as change of resources volume and structure, adjustment of strategic plan, entering new markets, creating new products etc. Also, under conditions of stable strategic position the enterprise may influence its close surrounding environment.

At the stability level of $[0,25 – 0,5]$ managerial measures in the system of strategic management are directed at stabilizing the situation, keeping equilibrium state and securing economic safety. In this range organizational changes may include change of markets, technology and business processes.

The stability level of $[0 – 0,25]$ stipulates enterprise management under nonstandard, extreme conditions and is directed at overcoming the current crisis situation. Under these conditions the enterprise is aimed at short-term survival, loses economic safety and requires profound changes in the internal environment.

1.6.   FIELD STUDY

To further explore the methodology of strategic flexibility evaluating we conducted an explorative case study. The case was studied in 2011 and encompasses in-depth semi-structured interviews with the CEO, a business managers and analysts of Ukrainian automobile industry. Archival data based on internal documents, industry publications, and other written materials were used. The case will be described in more detail in the following section.

For exercising practical probation of the suggested methodical approach we selected the branch enterprise "Automobile assembling plant № 2" of Private Joint-Stock Company "Bogdan Motors".

At the first stage we executed selecting the criteria of enterprise flexibility assessment. The method of sociological research enabled us to draw up a questionnaire and conduct survey of automaking managers and leading specialists of the industry with the purpose of detecting the most significant factors effecting the flexibility of the target enterprises group.

Using the results of the research we found out that the most significant factors influencing the flexibility of Ukrainian automaker are as follows: financial flexibility, technical flexibility, operative flexibility, technological flexibility, innovative flexibility, managerial flexibility and information flexibility (table 1.3).

This selection is determined by high dependence of the automaker operation efficiency on the level of the technologies applied, availability of financial capacity and management quality.

Table 1.3 Assessment of the factors effecting automaker flexibility

Flexibility type	Weight
Financial flexibility	0,20
Technical flexibility	0,20
Operative flexibility	0,10
Technological flexibility	0,10
Innovative flexibility	0,10
Managerial flexibility	0,20
Informational flexibility	0,10
In all	1,00

For assessing financial flexibility of the enterprise we used: coefficient of own funds security, current liquidity coefficient, intensity of advance capital turnover and own capital profitability. Technical flexibility is described by an average period of technological system reconstruction and efficient fund of technological system operation time. Operative flexibility is characterized by enterprise resistance to renovation, ability for renovation and renovation profit rate. Components of enterprise innovative flexibility include: a share of new products in sales volume and a share of research and design

elaborations in total effort. Managerial flexibility depends on the management expediency, quality of managerial decisions implementation and feedback quality. Among indices of information flexibility assessment we distinguish an estimated cost of renovating information database as well as quality of utilities.

On the basis of calculating above-mentioned indices we accomplished assessment of the flexibility level of each component constituting enterprise strategic flexibility profile (table 1.4).

Table 1.4 Integral assessment of strategic flexibility level of State Enterprise "Automobile assembling plant № 2" of Private Stock Company "Bogdan Motors" in 2011

Flexibility type	Weight	Value	Max value	Level			Weighted value
				High	Middle	Low	
Financial flexibility	0,2	2,70	5	1	0,7	0,3	0,69
Technical flexibility	0,2	0,87	1	1	0,7	0,4	0,87
Operative flexibility	0,1	0,73	1	1	0,6	0,3	0,73
Technological flexibility	0,1	0,45	1	1	0,4	0,1	0,45
Innovative flexibility	0,1	0,60	1	1	0,6	0,2	0,60
Managerial flexibility	0,2	0,67	1	1	0,5	0,3	0,67
Informational flexibility	0,1	0,72	1	1	0,6	0,3	0,72
Enterprise strategic flexibility index	1,0	x	x	x	x	x	**0,66**

Typical characteristics of the researched enterprise flexibility include: financial flexibility, technical flexibility, operative flexibility, technological flexibility, innovation flexibility, managerial flexibility and information flexibility.

Relying on the data received and arranging gathered information, we built up enterprise strategic flexibility profile and calculated the integral index of strategic flexibility assessment with the purpose of substantiating corresponding measures in the system of enterprise strategic management. The graphical interpretation of the strategic flexibility profile of the enterprise researched facilitating visual perception of the information received is presented in figure 1.3.
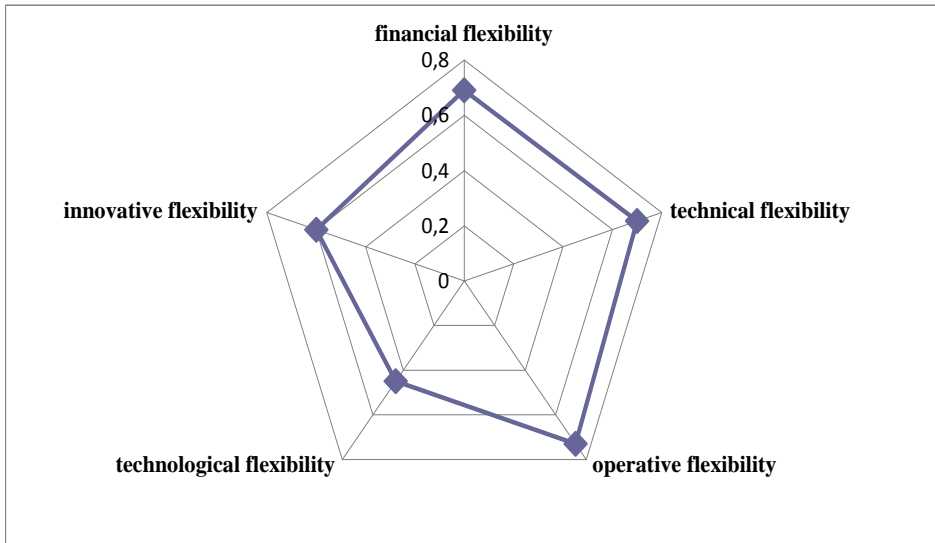
Fig. 1.3 Strategic flexibility profile of State Enterprise "Automobile assembling plant № 2" of Private Stock Company "Bogdan Motors" in 2011
Source: own work

As figure 3 shows high level of flexibility is characteristic for operation of State Enterprise "Automobile assembling plant № 2". Stable financial situation, successful arrangement of the information processes and high ability for innovative activity are distinctive for this enterprise. All that provides guarantee for its competitiveness in the market.

The calculated integral index of strategic flexibility level assessment for State Enterprise "Automobile assembling plant № 2" is 0.66. It confirms that the enterprise adheres to the alternative strategic position. Managerial measures should be aimed at providing stable development of the enterprise and avoiding crisis situation. In the meantime, the system of strategic management may be characterized by such non-standard measures as change of resources volume and structure, adjustment of strategic plan, entering new markets, creating new products etc.

For providing strategic flexibility in this case it is advisable to realize optimization of enterprise business directions set with focus on minimum risks.

1.7. CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Nowadays success of the enterprise directly depends on its ability to transform its business model before external circumstances force to do so. Enterprise efficient operation does not depend on inertia but flexibility – ability for dynamic change of basic models and business strategies in response to the surroundings change. Therefore,

improvement of approaches to enterprise management is of greater importance. One of the modern approaches securing high competitiveness of the enterprise is providing strategic flexibility.

The proposed approach to enterprise strategic flexibility assessment is a tool which enables the enterprise to determine its current situation, find idle reserves, design and substantiate efficient development strategy.

The advantages of the proposed approach are as follows:

- Possibility to use the system of indirect indices that ensures uniformity of the measurement units used.
- Lack of the branch and/or other limits to using methods.
- Possibility to adapt the methods to the current needs of any enterprise (an enterprise can make choice and assess the value of the components researched).
- Possibility to estimate enterprise potential considering vectors of enterprise internal flexibility varieties and constructing polygon of enterprise flexibility profile.

Considering prospects for future research, special attention should be given to the elaboration of efficient mechanisms that provide enterprise strategic flexibility.

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THE DECISION-MAKING PROCESS IN REGARDS TO THE ECONOMIC INTEGRATION OF SMALL AND MEDIUM BUSINESSES

The article presents the results of the studies conducted on the economic integration formation processes for small and medium businesses; it also suggests a certain management algorithm of decision-making expediency in regards to integration development, and identifies positive and negative consequences of integration association development.

2.1.   PROBLEM STATEMENT

Increased competition makes an already tough business environment in a market economy more complex. As a result, Ukrainian businessmen associate various types of integration processes with the following perspectives: first of all, to minimize the risks of ineffective conduct of the case as a result of unforeseen short-term fluctuations; secondly, to strengthen their capacity for further development of small and medium enterprises in the context of globalization, financial crisis and other challenges.

The decision to join efforts with commercial partners and their specific forms turning in practice into a set of difficult analytical and strategic objectives, which are accompanied by the integrator in the first place (a private or legal person, whose initiative makes the problem rallying around the actual business project appear on the agenda), and then by other members of the future economic union.

2.2. ANALYSIS OF RECENT RESEARCH

The key prerequisite for the approval of the participation in the economic integration is the evaluation of the competitiveness of small and medium businesses. Undoubtedly, the need for radical ways of its market position improvement proves to come in handy when it is recognized to be unsatisfactory. Under such conditions, the management led by the owner, based on the information that appears in their possession, formulates appropriate solutions to the challenges before them. One of the most attractive solutions is the association of business potentials which is being favored about 58% of managers of small and medium businesses.

Small and Medium Scale Enterprises play a significant role in the economy. Their condition has an important influence on income distribution in a country. They are well performed when they are subcontractors of established firms assuring market and technology. Existence of entrepreneurship, developed regional markets and use of technology, lack of trade barriers, improved transport and communication facilities, policy support [14] are important factors of SME development. Networking among SMEs is another important source of positive outcomes. Overall strategy for improving competitiveness of the SMEs usually involves [15] enabling proper environment accessing competitive funds, developing entrepreneurship.

Intensive studies are conducted also on linkages between international and European equity markets [3, 4, 5, 7, 9). There are also studies on emerging markets using random walk process or mean reversion process [4, 8].

2.3. THE DECISION-MAKING PROCESS

Generalized decision-making process on the use of economic integration in order to improve the competitiveness of small and middle business in the sequence shown in Fig.2.1. It shows the choice of competitiveness will depend on the existing set of alternatives.

A specific set of measures in this regard to some key areas of success depends on the actual circumstances faced by small and medium businesses. Therefore, below is the outline of the prospects that can be expected in the context of economic integration [13]:

- Collective purchase of the materials, finished products and other inputs resources in increased volumes with the view of getting promotional discounts from producers or intermediaries;
- The use of transfer pricing in mutual supply of parts and components within an integration arrangement;
- The use of coordinated pricing on reclaimed markets without violation of applicable antitrust laws prohibiting cartel conspiracies;
- Using temporarily freed capacity of economic partners and savings at the expense of their own investment funds;
- Mobilization of temporarily unemployed labor and urgent conclusion of labor contracts with employees for fulfillment of contractors;

- Getting big contracts from government agencies through coordinated action at consortium bidding or auctions;
- Facilitating access to sources of funds by combining assets that are considered by financial and credit institutions as collateral object, etc.
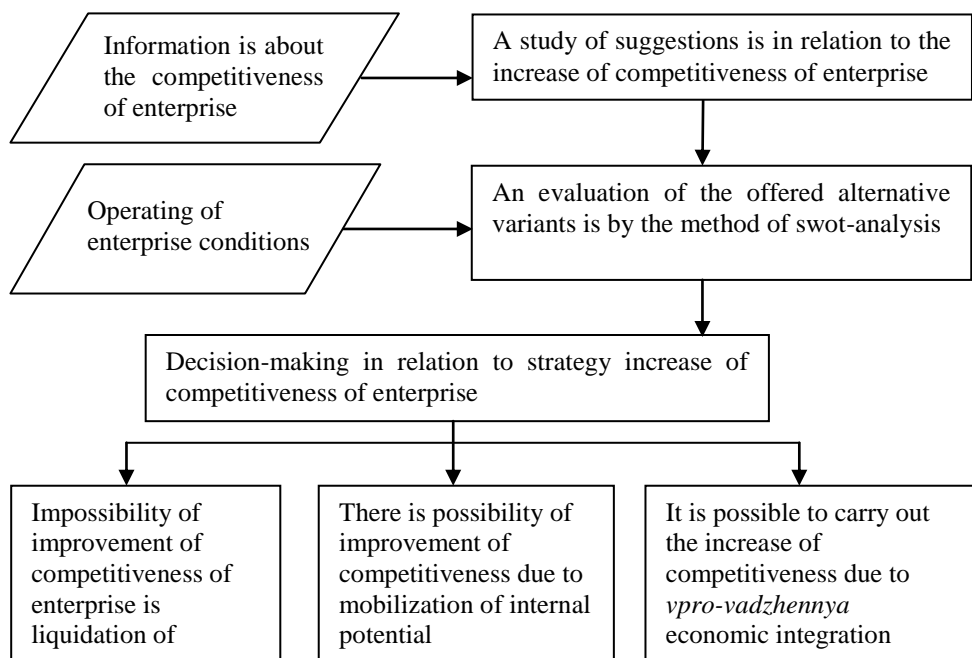
Fig. 2.1. The consistency of the decision-making process in regards to the economic integration of small and medium businesses

The checking procedures and improvement of the developed technology, the procedures that accompany its implementation, occurred during the execution of a number of consulting projects, commissioned by industrial enterprises in Ukraine [1].

Since the solutions to the problems identified by internal reserves are not found, the owners were recommended to use the potential of economic integration. The decision at this point is to turn the preparation and organization of the company's cooperation with its elected business partner. Detailed analysis of economic practice has shown that it is bound to meet the expectations of the parties in case the following principles are precisely kept up with [10,11]:

- Voluntary choice of partner and the type of economic activity for optimization of integration, unification initiated by most household subjects without any pressure from outside.
- Organizational design of the integration interaction (the special design and analytical work that allows you to determine the effectiveness of future joint work). It was determined that during the development of organizational project the data to

be obtained and analyzed has to have the following characteristics: a) goals and objectives of collective action, and b) the means and size of the combined financial and material resources to achieve stakeholder perspectives c) the legal form of a future integration, d) the content of competitive projects, including those whose content is mutually exclusive, and e) the total cost of implementation of integration measures, their structure and funding sources, f) the expected results of the cooperation.

- Continuous development of all aspects of business interaction. Implementation of this principle include: deepening cooperation through periodic adjustments goals of integration and mechanisms to promote them, diversify, which manifests itself in expanding the circle of mutual service members integration process and a gradual increase in their level of complexity.
- Information disclosure of the parties involved in the interaction. This provision requires institutional strengthening opportunities to get each side to the other information required to successfully implement its part of responsibilities within integration and provides a certain level of mutual trust.
- Orientation of superior member enterprises to consolidate its final outcome and social responsibility.
- The functional motivation of owners and staff members of the integration of education.

2.4.   THE PROCESS OF ECONOMIC INTEGRATION

Based on the fact that the process of economic integration of the small and medium-sized businesses is rather complicated, it's required by necessity to divide it into certain stages: one that preceded the introduction of economic integration (pre-integration), integration and post-integration. The algorithm of the first stage is shown in Figure 2.2.

The checking procedures and improvement of the developed technology, the procedures that accompany its implementation, occurred during the execution of a number of consulting projects, commissioned by industrial enterprises in Ukraine [12].

Since the solutions to the problems identified by internal reserves are not found, the owners were recommended to use the potential of economic integration. The decision at this point is to turn the preparation and organization of the company's cooperation with its elected business partner.

Detailed analysis of economic practice has shown that it is bound to meet the expectations of the parties in case the following principles are precisely kept up (Figure 2.2).

The effectiveness of any management decision-making process that involves a radical change in the conditions and principles of doing business (especially when it comes to the prospect of regulation, coordination and even fusion structures was totally independent companies) is based on the principles of organizational design. Therefore, it

is considered appropriate to identify the following stage as the priority that should be achieved in the implementation of the first of these stages - formulation of its mission.

It is a guide for employees of small and medium-sized businesses in the definition of the causes and scope of its implementation, outlining in principle the range of duties and takes into account the interests of the major groups involved in the planning and implementation of economic integration. Moreover, the mission should consider sectorial specification of an entity's position in the market, the type of production, the behavior of competitors and consumer attitudes toward integration of planned actions.

Based on the above, it was most appropriate mission of economic integration was finalized, namely the conquest and retention of the leading competitive position on the market.

Later on, the goals small and medium-sized businesses seek are identified on the grounds of the mission, while still keeping up with the course of integration. It, in return, is an effective management tool if the following criteria are met. Firstly, the aim should be expressed in a precise form as abstract formulation is not able to be a guiding requirement to the activity and impede further control over it. The second criterion – the quantitative disclosure of the content purposes. This is clearly perceived by leaders at all levels, and performers, enabling the use of formal methods outlining the prospects for economic integration. Another requirement - the reality of achievement, which is caused by how the employees involved in the case agree with the proposed future for them, encouraged by the owner, physically or intellectually are able to translate plans into reality. Furthermore, formulating objectives to consider the features and compatibility of corporate cultures that emerge in enterprises that seek to joint action. And this is nothing more than an additional characteristic goal - acceptability. The last criterion - flexibility (with time state of the business environment and attitudes of participants integration may change so that the target will require a minimum of clarification, if not require a full audit).

```
┌──────────────────────────────────┐      ┌──────────────────────────────────────┐
│ A decision-making is about        │─────▶│ Formulation of mission of economic     │
│ integration                       │      │ integration                            │
└──────────────────────────────────┘      └──────────────────────────────────────┘

┌──────────────────────────────────────────────────────────────────────────────────┐
│ Determinations of aims, which it is foreseen to attain due to economic integration  │
└──────────────────────────────────────────────────────────────────────────────────┘

                              YE
        ┌──────┐          ◇ Does have an enterprise of partner ◇
        │  I   │◀─────────   from economic integration?
        └──────┘
                                      NO
        ┌──────┐          ┌──────────────────────────────────────┐
        │  I   │─────────▶│ Choice of priority type of economic   │
        └──────┘          └──────────────────────────────────────┘

                              YES
 ┌─────────────────┐     ◇ Is demand on ◇
 │ Expedient is    │◀────   products cyclic?
 │ conglomerate    │
 │ integration     │
 └─────────────────┘
                          NO
                                                              ┌──────────────────┐
                     ◇ Is the production of goods        YES  │ The best         │
                        carried by seasonal character or ────▶│ economic         │
                        has a separate market of sale? ◇      │ integration of   │
                                                              │ enterprises is   │
                                                              │ mixed            │
                          NO                                  └──────────────────┘
 ┌─────────────────┐
 │ Effective       │     ◇ Is there a requirement in the ◇
 │ is ar'er-       │◀────   own system energy and
 │ gardna          │ YES    teplopostachannya?
 │ integration     │
 └─────────────────┘
                          NO
 ┌─────────────────┐                                         ┌──────────────────┐
 │ The best is     │ YES ◇ Coefficients of variable ◇  NO    │ Expedient is     │
 │ vertical        │◀────   charges more coefficient  ──────▶│ horizontal       │
 │ integration     │        of permanent ?                   │ integration      │
 └─────────────────┘                                         └──────────────────┘

        ┌──────────────────────────────────────────────────────────┐
        │ Search and authentication of strategic partner (-iv)       │
        └──────────────────────────────────────────────────────────┘
                              ( Π )
```
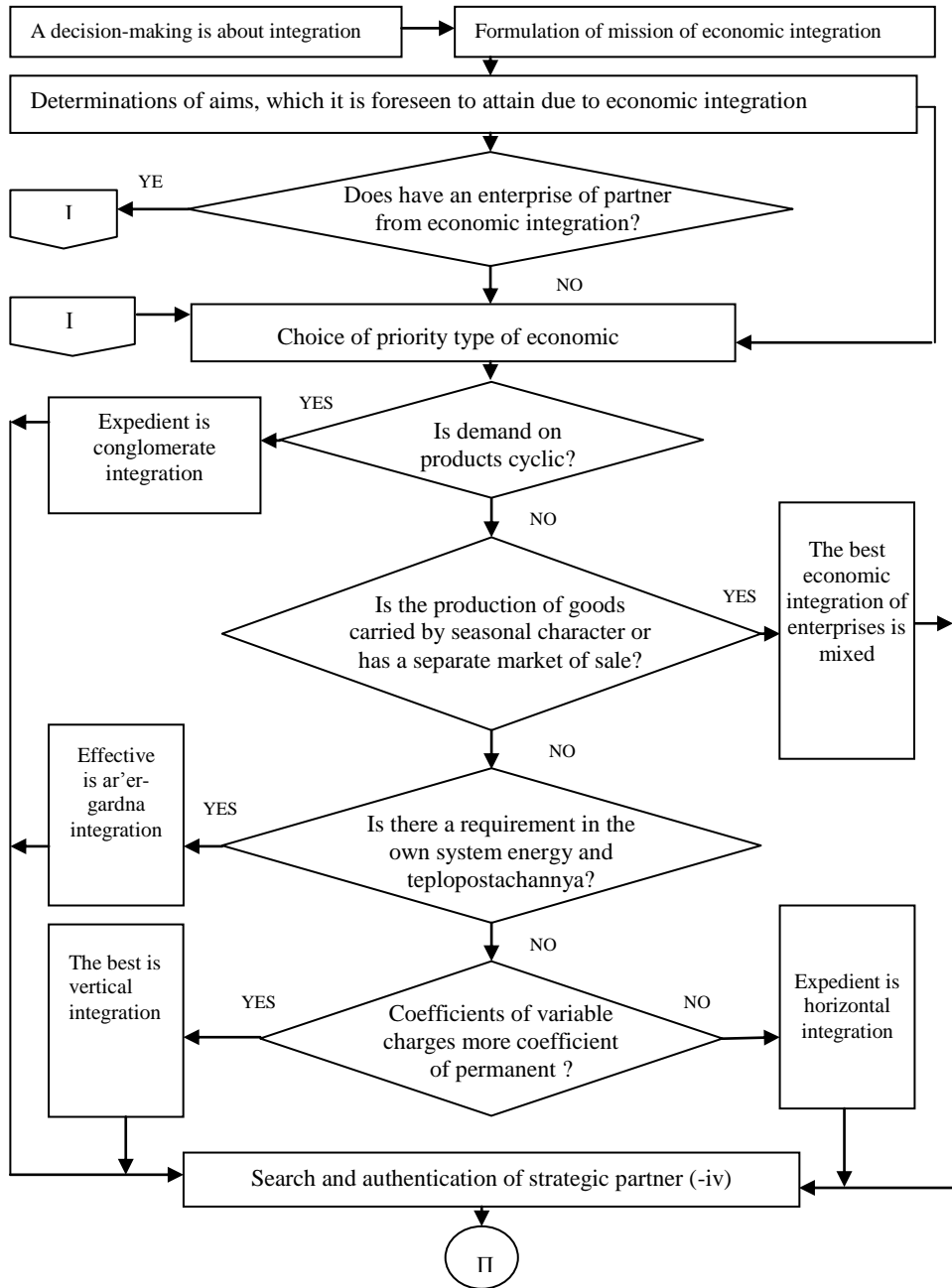
Fig. 2.2. The implementation process of the pre-integration stage of SME economic integration
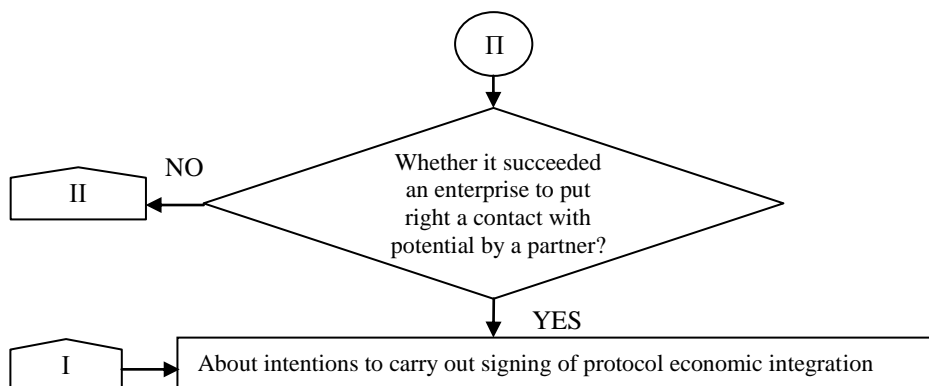
Fig. 2.3. The implementation process of the pre-integration stage of SME economic integration
(continued)

On the grounds of evaluation of the competitive potential and outlined provisions of competitiveness the relevant objectives for the small and medium businesses economic integration were formulated. The most significant of them are given in Figure 2.4.

The next stage of introducing economic integration is the definition of a potential business partner. This issue can be solved in two different ways. The first is that in the external environment of small and medium-sized businesses there are already entities, the interactions with which are based on the principles of economic integration and the relationships with them only require formalization. Otherwise, as confirmed practice, it is difficult for management of small and medium-sized to immediately determine the best of them, since the beginning of the case is to identify a strategic partner (or partners - depending on the goal).

Analysis of companies from various industry specializations allows us to assert: for those of them that belong to the commercial sector and those providing domestic production services or even expedient to select the horizontal type of economic integration. Industrial enterprises SMEs effectively implement its competitive potential through the use of vertical or mixed schemes. Using principles conglomerate integration will minimize the risks of bankruptcy farms.

Equally important decision planned in the implementation of economic integration of a business policy – a set of values, regulatory requirements, criteria, constraints, and other components of the "rules" that treat all members equally consolidation. In determining the appropriate boundaries of business activity, the policy in concentrated form reflects the views of the owners (and they are its authors) the conditions under which the possible implementation of the established mission – improving competitiveness.
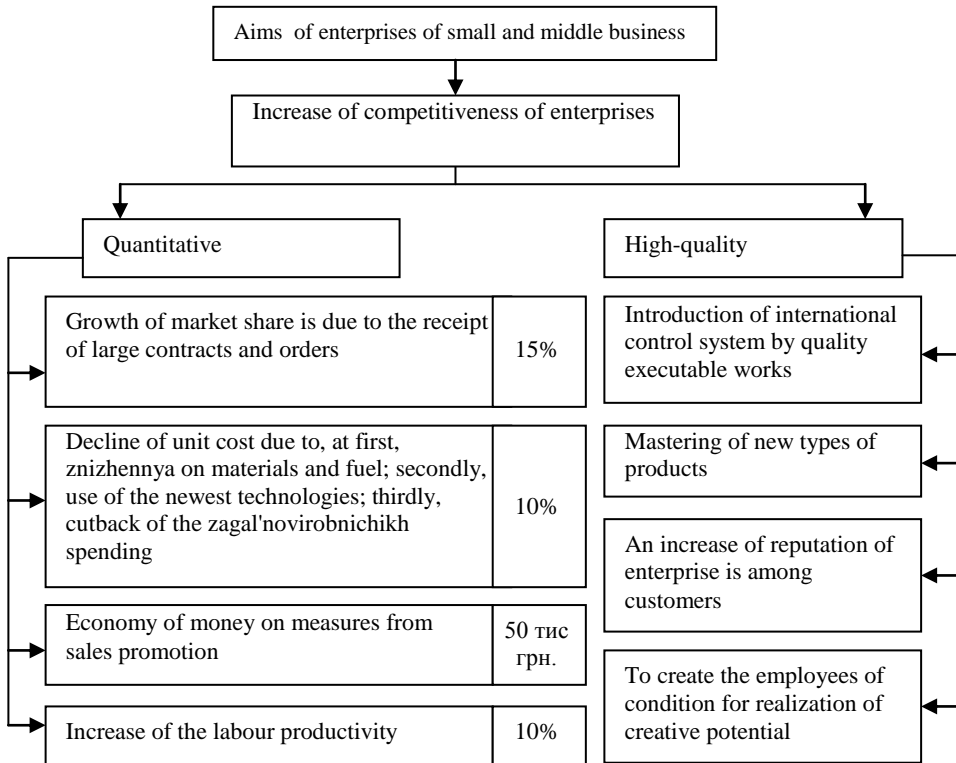
Fig. 2.4. Target orientation for small and medium businesses

The crucial task of the second stage is to identify patterns of communication between partner companies. Constructive solutions in this regard are taken considering the prospects of achieving the goals, either by establishing joint activities without statutory "design relationship," or the creation of a legal entity. Developed about this classification is presented in Table. 2.1.

The choice of a particular model of integration depends on the totality of the economic interests of its members, which in turn is determined by the consolidation of their property, the level of autonomy of participants, the degree of integration, the volume of transaction costs. In addition to the choice of organizational form of economic integration should also take into account the nature of the goals and possibilities for joint activities, frequency of interaction and involvement of participants in solving common integration problems; planned duration of cooperation. Given the stated criteria, the matrix of the economic integration alternatives selection of small and medium businesses is presented in Fig. 2.5.

Table 2.1 Characteristic patterns of integration relations of small and medium businesses

Integration model		Change of legal independence	Delegation of authority	Tools for creating integration ties
With the establishment of entity	Merger	Both companies are losing their independence	Shared authority	Creation of a new company, which transferred the assets of companies that merge
	Acquisition	One company loses its independence, the other one not	Powers of one or more enterprises cease in favor of another	There is the elimination of one or more companies and their assets transferred to another enterprise
Without a legal entity	Submission	Enterprises remain legally independent	One of enterprises loses some powers	Gaining control is carried out by buying shares in other companies
	Consolidation	Enterprises remain legally independent	Companies lose some of their powers	The integration is carried out by buying corporate rights, or by their exchange
Without a legal entity	Creating a holding company	Enterprises remain legally independent	Part of the power is transmitted back ups	There is a transfer of shares of companies that integrate into a newly established enterprises
	Affiliate agreement	Enterprises remain legally independent	Powers delegated	Signing contracts by parties involved

The process of designing economic integration is finalized by the prior agreement and clarification of the text, followed by the conclusion and (if necessary) the state registration of statutory documents between owners of small and medium-sized businesses – the initiator of intercompany collaboration, and selected business partner.

The main task of the next – post-integration – stage of the process is to develop a strategy for the integration of education. Its purpose is to achieve fundamental long-term goals and solving important problems of current enterprise by identifying areas of movement to them, and the sources of funds that provide continuity and positive dynamics of growth and development of competitiveness.
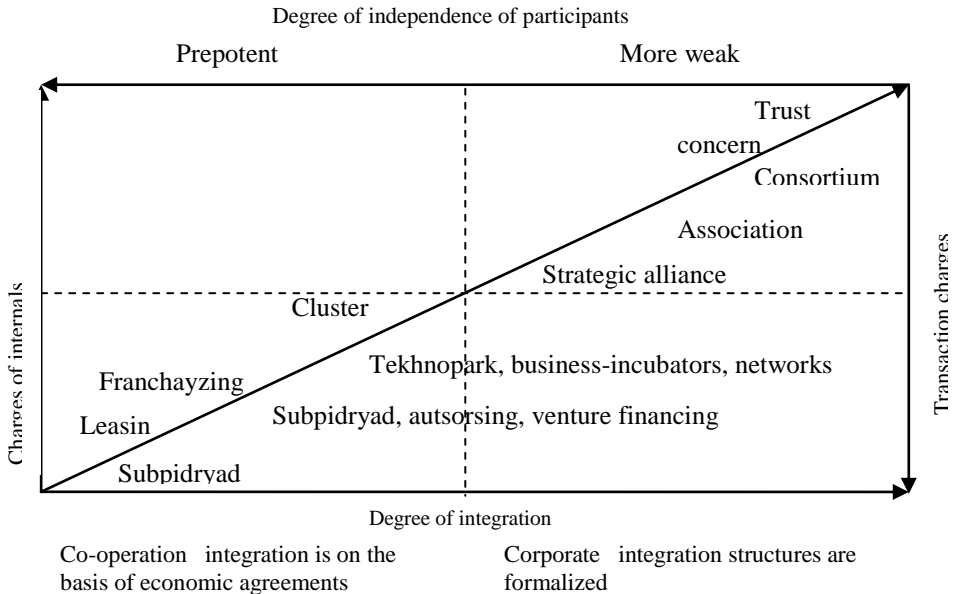
Fig. 2.5. Target orientation for small and medium businesses

Development strategy of economic integration based on established competitive potential of each participant consolidation and considers events that occur in the environment, the state of which the responsible person assessed in the dynamics. One of the main prospects associated with economic integration firms, is the ability to mix specific resources of the association. However, for effective exchange, leaders of small and medium enterprises should conduct appropriate reform business practices prevailing in the part that does not meet the new conditions of management. It is, above all, the organizational changes that in economic integration entities manifested through: changes in the structure and functions of the organization, improving marketing strategy, development of methods of management and personnel, upgrading the technological base, improving the mechanisms of motivation.

The success of the strategy of economic integration depends on the efficiency of communication systems of enterprises. Select the type of organizational structure formation requires integrated primarily to assess the possibility of their combination in order, first, to keep the unique administrative skills, knowledge, core competencies, quality and speed to achieve synergies and secondly, optimum combining organizational culture. Analysis of known agreements on economic integration of small and medium-sized businesses has provided grounds for the conclusion that the decision in favor of one or another type of organizational structure is based on the main function of selecting the type of integration (Table 2.2).

Table 2.2 Types of organizational structure for the integration formations of small and medium businesses

Type	Formation factors	Recommended structure type
Horizontal	Members of the integration process are scattered	Divisional-territorial
	Serviced by different market segments	Divisional-consumer
	Significant differences in production technologies	Divisional-products
	Different types of organizational structures	Divisional or matrix
Vertical	The level of technology integration: - total integration	Line-functional
	- partial integration	Line-staff
	Territorial branching of enterprises	Matrix
	The degree of participation in the production of the final product: - full participation	Line-functional
	- partial participation	Line-staff
	Different types of organizational structures	Matrix
Mixed	The need for coordination in the following areas: - financial	Holding
	- marketing or production	Conglomerate
	The need for coordination of integrated affiliation in general	Coordination
	Focusing on complex projects and large orders	Project or program-target

2.5. CONCLUSIONS

Based on the above information, it is important to stress the need for continuous monitoring of the process of economic integration (as during its creation and further the process of joint action), as well as implementation of its results of adjustment goals, objectives and ways to achieve them and solution.

Implementation of the above methods has confirmed its soundness. Based on the results obtained during the study concludes, the decision to merge even a fraction of their assets with commercial partner in the joint business projects for small and medium businesses is a complex and multistage process. Each of them has to be taken into account under a number of restrictions and formulated criteria. In their respect, constructive initiatives will improve the market position of partners, which simultaneously means of strengthening their competitiveness.

The tests confirmed the performance practice developed technology movement to the desired goal of economic integration of the idea to its implementation, through solving the problem of determining a strategic partner to the joint plan of action in the real world market segment.

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3

GROUND OF NECESSITY OF THE RESTRUCTURING PROCESS OF THE AVIATION ENTERPRISE

In the article the necessity of realization of restructuring on the enterprises of aviation industry is grounded. The characteristics of main risks of making restructuring decisions are also presented.

3.1. PROBLEM STATEMENT

Nowadays, many modern market economy models are actively developed as a result of reorganization, reforming, restructuring, operating and developing of integrated corporative economic structures [21]. Such structures hold companies, groups, concerns, business associations and others. It is commonly known that a group of organizations, especially diversified, has great competitive advantages over the conventional mono-organizations. Therefore today many economic entities, mostly small and medium-sized businesses, and in some cases even big business, actively seek to create all kinds of the integrated corporate formations. As a result a group of organizations can actively oppose the actions of competitors, effectively develop, maintain that there is and gradually occupy new niches in the market.

At the same time the powerful integrated holdings that have already formed and actively worked in the markets, groups, the financial - industrial groups have already reached a certain economical level of development. But in order to further strengthen their position in world markets and to reach more effective (profitable) functioning, various steps can be done to radical reorganize their economic structures, i.e. resorting to restructuring (or so-called reengineering) [14]. In this regard, special relevance for most entrepreneurs is the development of specific methods, ways, approaches, recommendations on the theoretical and practical levels.

Of course, the main characteristics of reengineering (organizational design) [20] is the individual approach, that is, any methods of organizational design can be effective

only if they are used and the specific conditions, considering the specifics of every individual situation. For example, when creating any organization, group of organizations always must be considered the industry specific, the human factor, and the geographical region. It is very hard to produce the clear and universal mechanism for creating an organization or group of organizations, because any organization or group is the strictly individual entity object with its team, its business connections, its sphere of activity, etc.

The enterprises restructuring is the central and indispensable element of general economic reform and economic recovery in the country. The availability of macroeconomical and political conditions [8] that provide the free development of the economy are successful. They constitutes the result of increase the competitiveness of the market only if the company transformed and become competitive. When enterprises and their associations in the functional or the institutional sense are not harmonized with the socially-economic and institutional environment, then performed transformation are appeared either unsustainable or ineffective. The only way out of this situation is the reorganization of existing enterprises based on the elaboration and implementing programs of adaptation to external conditions and factors. Changing market forces and processes globalization of the economy. One of the most effective mechanisms for entering aircraft construction enterprises in the new competitive environment is the restructuring of business.

In modern conditions the process of aircraft construction enterprise restructuring is the objective necessity, which ensures the survival and competitiveness. The generalization of scientists' approaches allows us to conclude that there are different interpretations of the enterprise restructuring [1]. The restructuring regards a purposeful complex of changes in the organizational and functional structure of the enterprise, which can improve the efficiency of its activities.

3.2.   ANALYSIS OF RECENT RESEARCH

There are extensive research conducted on the process of enterprises integration and economic growth. One of the important economic growth factors is the early pattern of developing economies is increasing returns from the coordination externalities resulting from capital accumulation [12]. Among critical factors for continuing development one can find [12] investments in human capital, education and R&D become critical for continuing development. However, the economic growth is also dependent on economic history and incentive structure.

The institutional determinants are also extremely important. Institutions need to obey the formal rules, such as constitutions, statute and common law, regulations. It is also essential to consider the informal constraints [9, 11]: conventions, norms, internally devised codes of conduct. Additional significant indicators are [15, 19]: income, education, and ethno-linguistic fragmentation. Such social fragmentation makes it more difficult to establish and maintain high quality public institutions [16].

Additional general rules consider separation of the polity and the economy as well as rules of law. Institutions producing such results vary with the technology, organizational imperatives, and the characteristics of the polity [11].

The extensive literature considers also different kind of trade barriers [4,5] (including ntra-regional tariff and non-tariff barriers to trade) and pattern of foreign direct investment and trade [6,7]. Distinguishing between the effects of market accessibility and the impact of individual country size is also analysed.

In particular, improvement of the economic integration of market accessibility is also considered [11]. It is induced outside companies to invest in the integrated regional bloc, and leading to increased trade volumes between the integrating countries [11].

3.3. METHODS AND TECHNOLOGIES OF INTEGRATION

Globalization processes, computerization of the society, increasing of dynamics of the management area and other integration processes are becoming the basis of introduction of the new model of economical development of national economics. Besides the conditions of competitive confrontation are getting more sophisticated, the additional barriers for national manufacturers going out to the international market are created. One of the ways of solving these problems is expansion of integration processes and initiation of business combinations.

 Under such circumstances the necessity of examination of predominant methods and technologies of integration realization that are implemented into computerization of all processes become very actual, regarding the limits of integration formations, organization and foundation of effective organizational and legal form of IIBS, enhance of the efficiency of management and productivity of integration structures activity. Economical integration of business companies in modern circumstances are determined by formation of financial and industrial capital. The financial and industrial capital is the integrated form of industrial, financial and intellectual capital, it has its internal structure of interaction that allows to realize most effectively the process of consolidation of investment resources for the further development and improvement of management and production process. Integration of industrial, financial and intellectual capital is based on the conception of production that together with specialization, cooperation, combining and diversification define integration of establishments and serve as the basis for getting synergetic effect. It means that consolidation of financial and industrial capital as an essential condition of production concentration determines the direction and ways of investment resources formation that directly influences the effectiveness of investment management comparing with other forms of organization of different business units. International processes are displayed in appearing of new characteristics in obtained integrity, due to development of establishments in inseparable connection of integration and disintegrative processes.

Therefore, from the point of view of economical system of integration we can consider both the association of economical subject and broadening connections between them [2] or as dynamic process of liquidation of discrimination [10], creation of

favourable for each of them circumstances of realization of economical activity [2] and intensification of interaction for more effective use of exclusive competitive advantage [3] and obtaining of synergistic effects. With that, integration can be compared to industrial cooperation, the definition of which is provided in terms glossary of United Nations Economic Committee for Europe. In such circumstances the strategic integration will be observed as relations between the establishments that are based on long-term community of interests [3].

Integration of corporative structures can be realized by following methods: financial (capital concentration), organizational (production concentration); management (creation of a certain system of participation/ controllability) ways of coverage (creation of certain territorial formations).

Under creation of corporative structures by financial ways we mean financial take over or control of work of separate business units with the help of the following operations: purchase of other company's capital, purchase of all net wealth of another company, derecognizing of another company's liabilities; purchase of a part of another company assets, together they form one or several types of business. And rigidity of formation (the force of ownership relations) is defined in tough IIBSs. All IIBSs participants belong to owners or franchisers for more than 75% (qualified majority) or there is an agreement concluded between the establishments, that gives the franchiser an opportunity to dictate its decisions to affiliate company. In soft (diffused) IIBSs the situation is the following – in integrated ownership there are controlling interests of establishments-participants and large shareholdings that give the opportunity to influence the decision making (they cannot reach 50%, but as a rule they reach this limit in Ukraine).

Under creation of corporative structures by organizational ways we mean organization of coordination between structural elements. It can be submitted to manufacturing process (that can be realized by concentration, specialization, cooperating, combining, diversification of the production) or it can be oriented for maximization of consolidated profits (independently from the contribution of separate participants of integrated cooperation).

3.4.   RESTRUCTURING PROCESSES OF ENTERPRISE ASSOCIATIONS

Looking at the life cycle of enterprises can be set the necessity point of restructuring (Fig. 3.1).
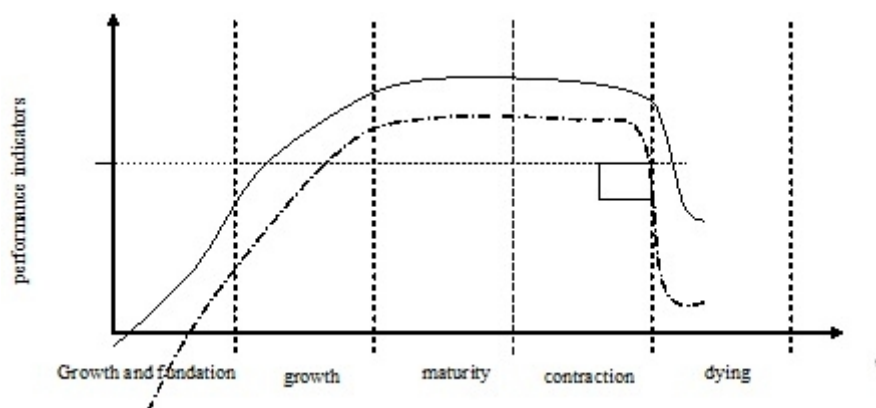
Fig. 3.1. The definition of "restructuring point" based on the life cycle curve of enterprises

"The point of restructuring" is defined to select start date of the innovative transformations considering complex of factors that have influence on the effectiveness of the restructuring process based on using of technology for constructing life cycle of the organization and methodology for determining financial stability: the coefficients of autonomy, liquidity, business activity, efficiency of the aircraft construction enterprises.

The restructuring strategy of specific enterprise should include [17]:

- reduction of cost and increase productivity, reduction of the expensiveness of production, increase the quality control of goods or services;
- Implementation of thoroughly based new production technology of products or services;
- modernization or replacement of the technical equipment.

The expediency analysis of restructuring processes of the enterprise associations has the following stages (Fig. 3.2).

```
┌─────────────────────────────────────────────────────────────────────────┐
│              Selection in the structure of corporate associations:          │
│    –   non-core enterprises                                                  │
│    –   enterprises with productive potential                                 │
│    –   unprofitable enterprises                                              │
│    –   enterprises with the prospect of increasing the share of capital in   │
│        the enterprise association                                            │
└─────────────────────────────────────────────────────────────────────────┘
                                    ⇓
┌─────────────────────────────────────────────────────────────────────────┐
│                        Making the decision about:                           │
│    –   Possible changes in the technological bases of production             │
│    –   The possible introduction of innovations                             │
└─────────────────────────────────────────────────────────────────────────┘
                                    ⇓
┌─────────────────────────────────────────────────────────────────────────┐
│          Saving the technologically important and profitable enterprises    │
└─────────────────────────────────────────────────────────────────────────┘
                                    ⇓
┌─────────────────────────────────────────────────────────────────────────┐
│        Analysis of mechanism of the enterprise association restructuring     │
└─────────────────────────────────────────────────────────────────────────┘
                                    ⇓
┌─────────────────────────────────────────────────────────────────────────┐
│   Prediction of adaptation of the reorganized association of enterprises to  │
│                    the external conditions and factors                       │
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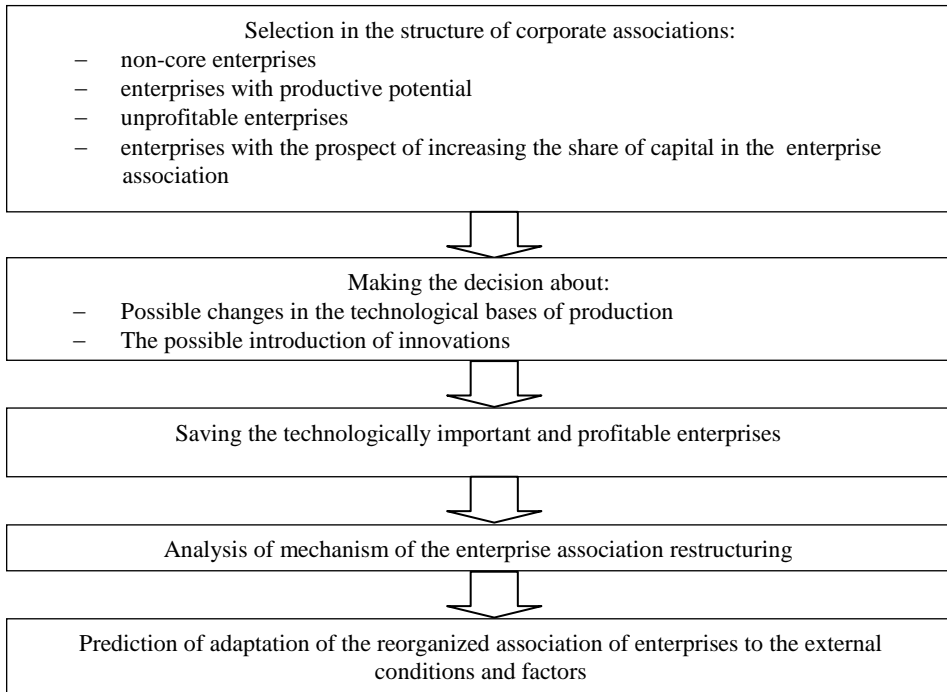
Fig. 3.2. Stages of the restructuring processes of enterprise associations

Restructuring of industrial enterprise associations needs careful analysis and development of principles and methodological approaches based on the use of modern theories of management, production and measures to improve the competitiveness of enterprises and strengthen their market positions.

In modern transformational terms the restructuring has become a powerful market mechanism and tool for improving the competitiveness of enterprises and includes a complex of measures aimed at matching enterprise operation in the dynamic conditions of market development. The restructuring is aimed at improving the structure and management functions, eliminating the backlog in technical and industrial processes, improving economic and financial policies and achieving the increase of production efficiency, product competitiveness.

From positions of a systematic approach restructuring defined as a process that occurs in the reproductive relations system of companies covering the whole string of goods movement "production – distribution – exchange – consumption" and consists in the structure changing of production, assets, liabilities, and management systems to improve the efficiency of production and the competitiveness of production of corporate associations companies on sales markets and adapt to environmental conditions. The main features of restructuring mechanism model of the aircraft construction enterprise associations should consider the association representing as an open system which has its own life cycle, interacts with the environment and creates objective conditions for the

establishment and development of cooperation, integration relations of the association of enterprises with association members in various forms.

Adaptive approach to restructuring includes the effect of time and external factors on the process of reform, eliminates chaos in its implementation due to complexity of the strategic focus and priority of solving problems during restructuring.

By means of the indicators analysis of financial and economic activity can be detected by the dynamics of indicator fluctuations in liquidity, business activity, and relative efficiency indicators.

Development and adaptation in business the realization program model of restructuring that includes conducting relevant measures taken to determine the competence of business processes and their possible prospects.

Restructuring is the real way to overcoming the crisis on domestic enterprises. And improving the development and implementation of the restructuring program and the formation of practical recommendations for building a new business model of companies such as aviation industry will adapt their activities to the changing economic conditions, to overcome the existing crisis phenomena and increase the competitiveness of their products in the domestic and foreign markets.

Choice of methods for restructuring is determined depending on the strategies, objectives and condition of the company.

If the company has decided to conduct the operational restructuring, the following methods can be used. Firstly, methods of restructuring of the property complex, such as leasing, conservation, liquidation, writing off assets and their realization. Secondly, methods of payable restructuring, including recognition the debt invalid, deferment or installation of debt, with further repayment, debt repayment at minimal cost, redemption of rights requirements to the creditor and then the presentation of requirements and many others. Thirdly, the organization can use the methods of restructuring of the receivables, including repayment of arrears with the obtaining of maximum economic effect, recognition of debt invalid, and various forms of the staff exemption or downsizing.

3.5.   THE TOOLS OF STRATEGIC RESTRUCTURING

If the enterprise has already managed to arrange a high level of operational efficiency, it starts using the tools of strategic restructuring, in particular improving the structure of business portfolio of the company, creates management and financial potential for the new growth. This can be achieved either by removal of the business portfolio of the areas that are not critical to the future of the enterprise, or by strengthening the strategically important directions for the company through the acquisition of a new kind of business. Over time it will help it gain the trust of the investment community and have a positive impact on the results of its financial activities.

The risk of premature evaluation of the restructuring results

In practice, to determine where are beginning the real results of structural change very difficult. Often the negative short-term consequences of restructuring management company accepts as its outcome. In this case, the whole program can be minimized, and strategic objectives have not been reached. To minimize this risk is necessary to competent drawing up a restructuring program [13] with a detailed description of all short-term results and targets, as well as the definition of long-term objects.

The risk of insufficient qualification of representatives of the government enterprises

This risk can be minimized in two ways. Or by the dismissal of management team and engaging a new team of managers. Or, the second option by holding specialized seminars to clarify to the management the objectives and guidelines of restructuring. In any case, to identify and manage this risk should be involved professionals from outside.

The risk of inaccurate estimates necessary to restructure resources

Traditionally, companies underestimate the complexity of restructuring. Therefore, for its implementation are given limited time terms, is involved a small number of professionals, stands out the miserable funding.

The risk of the low motivation of people involved in the process of restructuring

This risk means not only different degrees of interest in employees of the enterprise in the structural changes.

It includes a conflict of interest that may arise between management and owners of enterprises in the restructuring process and negatively affect their motivation for the project. To manage this risk is necessary to restructuring program came from above "down" and not "from the bottom up." It is extremely important the exceptional energy of owners. Their desire for achieving the objectives of restructuring should be transferred as team executives and mid-level managers, managers of grassroots level.

Risk of negative social consequences

The appearance of negative social consequences in the course of restructuring is the normal practice that operates in countries with market economy. It appears in the mass staff cuts of industries that operate, in dismissals on liquidated companies, closing the enterprises of social sphere.

In practice, staff reductions and output from enterprise social assets were especially prevalent in the mid 90-ies. Now enterprises influenced the state policy differently were treated to the problems of corporate social responsibility, in which they are, on the contrary, declared the creation of new jobs.

The risk of defective of the legal support project

Very often in the course of restructuring is necessary to make the legal changes. In the most common of them – the establishment of enterprises of one or more subsidiaries, creating the new economic society in common now – potential bankruptcy and its owners, enterprises bankruptcy, reorganization in the form of separation and in the form of allocation. Reliable statistics about how many total restructuring was conducted in such schemes in recent years, there are not. And obviously, of the legal restructuring are not backed by real organizational changes, changes in the financial, manufacturing systems in practice is only the half measures. On the other hand, an error of the legal support can minimize the changes that have already been implemented in the enterprise.

Only after the risks analysis and developing specific measures but neutralization of the possible negative consequences of risks must take a final decision about the need for a new business – model, create a group etc. The situation is much simpler if the business is operated as a set of organizations that are not incorporated and the group, which is dedicated for graduate students. In this case, the operating business owner, either begin to create a new group in an already busy sector, or take actions of reengineering of the business.

Economic (commercial) activities of any organization, group of organizations basically consists of the several major groups of business - processes:

- corporate relations in the group;
- relationships with providers;
- relationships with customers;
- relationships with lending institutions and organizations - creditors;
- relationships with insurance companies;
- relationships with investment companies;
- relationships with non-profit organizations;
- relationship with public authorities.

These groups of typical business processes are divided into the external and internal.

To the external business processes include those that occur between the group and external organizations (suppliers, lending institutions, organizations, lenders, insurers, investment companies, non-profit institutions, government agencies) that are not included in the group that is not receiving any participation or through ownership shares, shares of the group, nor by any agreement.

To the internal business processes include those that occur within the group (ie. between its members), group and external organizations (suppliers, lending institutions, organizations – creditors, insurance companies, investment companies, non-profit organizations) that are direct to the group or by owning shares, stocks, contracts.

In its economic essence of internal and external business – processes completely identical (suppliers are both internal and external), but in essence they are radically different.

The essence of the above business processes is as follows.

Corporate relationships in the group. As corporate relations in the group may be: ownership shares in the authorized capital, stock, special contractual relationship (eg, between the main and subsidiary company), internal economic operations Administrative Interface (participation in government – supervisory boards, boards of directors – representatives of the group) family relationships – business owners. Details are listed below mechanisms of corporate relations outlined in the LC, the Competition Act, the joint-stock companies (JSC) of the Limited Liability Company (LLC), the financial-industrial groups (FIGs).

Relationships with suppliers. In relationships suppliers include business transactions for the supply of materials, semi-finished products and components, finished products and services, ie. counterclaims cash flows from payments to suppliers for goods, works and services.

Relationships with customers including sales, implementation, procurement of goods and services, ie. cash flow from sales revenue.

Relationships with credit institutions and organizations – sellers. These relations include the entire range of financial operations: obtaining credit, loans, interest payments, settlement and cash transactions, factoring.

To relationships with insurance companies include cash flows to pay the insurance premiums by insurance companies and pay by insurance companies the compensation.

Relationships with investment companies combine a transaction associated with the securities – purchase and sale of securities, investment companies pay for purchased in them securities, obtaining revenue from investment companies sold their securities.

Relationships with non-profit organizations include cash flows directed on development of non-profit organizations (workshops, seminars, meetings, conferences, etc.), savings objects (pensions, health insurance), charitable purposes (helping the disabled, low-income, socio-cultural activities).

Relationship with public authorities include: the fiscal relationship – transfer tax, customs duties and fees, the subsidized relations – targeted budgetary receipts, reimbursement of state taxes; supervisory measures (monetary, tax, customs, antitrust control, control over market securities, supervision the insurance business, control the use of natural resources, monitoring of the environment, permits, licenses for certain activities, state registration of property transactions, etc., making judicial decisions.

Thus, in the shortest form of business processes, are:
a) movement of inventories – trade flows (materials, semi-finished products, goods, and so on);
b) cash flows and securities – cash flow;
c) Movement in fixed assets (fixed assets, intangible assets);
d) legal action (submission of reports to the authorities, obtaining licenses and so on) – documentary flows.

Trade and cash flows can be grouped into financial flows.

When choosing a business process should also remember that if the general business process is to describe the financial and documentary flows, then the design specifically combined organization or group must first take into account the specifics of individual industry that affects the same commodity and cash flows (eg, oil and

household appliances though they may be by rail, but how loading, storing completely different).

Internal business units in our opinion should be divided into five main blocks:

- owners, members, shareholders;
- production (making the main activity according to the technology of production);
- commercial (sales, advertising, purchasing, etc.) – financial (cash flow);
- service (service the all previous).

As business owners, created groups can serve individuals and legal entities – entrepreneurs, owners, shareholders, members (at the stage of establishment of legal persons – the founders).

Business owners, directly or through third parties owning shares, shares of Affiliated Entity are actually the owners of the entire business (in particular, of created group).

The manufacturing unit includes organizations in the development and exploitation of deposits, production companies and others.

The commercial unit is the organizations concerned with commercial and procurement activities. The financial block unites banks, insurance companies, professional participants of market, securities.

To the service unit may be included transportation, non-profit organizations, media, educational institutions, enterprises of social sphere that service the employees in the group, consulting, evaluation, audit organizations, and others.

The external business – units include:

- supplier organizations;
- shopper organizations;
- financial organizations;
- non-profit organizations;
- public authorities.

Business units are connected among themselves in a certain system, forming a business model of functioning of the creating group. Developing a business model designed group – one of the most important tasks of the organizational design of any object.

When a business model have already created, it is possible to form and control the management system, and a system of financial flows and the complex of technical, legal, personnel and other measures for the future of the group. Business model – is the economic foundation of any organization, group.

3.6. CONCLUSIONS

The main purpose of the restructuring process is to build a new business model on the basis of mechanisms: 1) selecting the business units, 2) Selecting the business process, and 3) Establishing the links between business units.

Presented principles of construction of the general conceptual business model of typical holding are exemplary and always requiring the analysis and considering the specifics of a particular holding or a single organization. At the same time, some basic principles of general conceptual business models holdings can be used in most organizations and groups. Among them are:

- Designed business structure must always follow functions and tasks, for management of which it was created;
- The business model must be clear for owners;
- Forming the organizational project of the creation of group of the restructuring business model is necessary first of all to the owner;
- Choice of future organization activities;
- Choice of the main business units composition;
- Classification of all business processes in industry, economic and other characteristics;
- Creation of a previous version of general conceptual business - model for future group after restructuring.

After the general conceptual business model of the future holding is already formed, it is advisable to design the organizational structure and economic future of the organization or group.

The first task that the owners have to solve before making organizational and economic structure of the holding – is the problem of choosing the general principle of constructing or the principle of cooperation or holding. For the Russian conditions, according to the author, the most acceptable principle of cooperation, in the construction of holdings is the principle of tight vertically construction - integrated structure based on the classic hierarchy of rigid centralized government or a major holding or companies that manages. Addicting of this principle caused by of historical (faith in the center, dominating), national (lack of discipline, theft), geographic (area greater length, resulting in reduced controllability) factors.

Thus, the formation of the organizing project of the group or individual organization, first of all necessary to:

- Choose the type of organizational management structure (or linear - functional, which is preferred, according to the author, for Russian conditions, or divisional);
- Choose the type of administrative relationships (explicit or implicit, or a combination of both types);
- Define the composition of all levels of management (top, middle and lower level);
- Define the composition, structure and objectives of basic services in the holding (industrial, commercial department, logistics and so on);
- Pass on the conditions of its business with regard to its individual maximum specific exemplary detailed organizational and staffing.

In addition to the fundamental commitment of the leadership to consider restructuring as an alternative to the traditional way of necessary selection and approval of certain strategic objectives to be achieved as a result of the project. In addition to increasing the efficiency of the organization (in the short term, resulting in effective management of costs), the use of appropriate economic instruments restructuring designed to lead the organization in an optimal compliance market that reflects the complex objects combined in model making strategic decisions about the need to restructure.

The purpose of changing business value expresses in achieving the quantitative results (eg. increased profitability, financial stability and value of shares) for the certain period. The purpose of a social nature is determined by agreement of business development and environmental protection of social workers, rising level of wages, incentive-based payments and so on.

The purpose of the main form of business determined by the needs of clients. These include, for example, achieving a certain quality in the design of product, production and logistics choosing reliable provider and innovative ability, as well as reducing and changing the structure of production costs and so on.

It is possible to achieve these objectives in a result of project implementation for the particular organization enables to talk about the necessity of using restructuring. Further analysis of achievement of these objectives will be the first step in rating the need, effectiveness and efficiency of using the appropriate economic instruments.

To avoid conflicting assessments of the impact of the decision on the restructuring of certain functions or business processes at the first stage of selection of goals should be determine their priority for different objects obtain a profit (the core of the organization – the production of products or services, or other activities).

For authentication and priority of aims the possible use of principles of design of the economic system, that allows the prediction of negative and positive moments at a decision-making about the lead through of restructuring.

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4

JUSTIFICATION METHODOLOGICAL APPROACH TO THE EVALUATION OF THE QUALITY OF INTERNATIONAL AVIATION ENTERPRISES AS THE OBJECTS OF PROPERTY

The article considers estimation methods of international airline companies as objects of property. Features of object of property quality are also presented. What is more, the financial state of airline companies is analysed.

4.1. PROBLEM STATEMENT

An object of property quality is assessed on the basis of the set of characteristics, resources provision and conditions. They make the possibility of beneficial use in the organization process of financial activities.

Consideration of resource provision allows to determine the quality of the property in the following groups of indicators: 1) indicators of economic status, 2) performance of financial condition, 3) indicators of financial and economic activity, 4) performance assessment of manpower.

Material resources owned by AC are included in its statutory fund. Simultaneously they are its assets.

Among resources providing activities of international AC-airlines one can find airport complex of buildings, buildings as well as machines and mechanisms which are intended for passengers and cargoes before their landing (loading) on board of AP.

The estimation of airline companies as objects of property presented in this article is based on the international AC-airlines resources and their financial activities. The rest of the paper presents the estimation model dedicated to international airline companies.

4.2.   ANALYSIS OF RECENT RESEARCH

There is scientific literature available on the subject of the airline finance and economy. deregulation of aviation industry. aviation industry generates 32 million jobs worldwide and contributes nearly 8% to world gross domestic product [4, 16]. What is more, air freight has also been growing rapidly, though it remains a small share of total air traffic.

Deregulation of aviation industry and movement it into private sector caused the need of airlines, airports, and air traffic controls operating in new standards. Also new financial and economical measures is applied to it. It is claimed [4] that the aviation industry should transform its traditional business model and move to a model that allows them to operate in a new global business environment considering environmental alignment of business goals. The airline market was opened in USA first, since it was the first to privatize. Europe and, later on, the rest of the world followed that trend. USA and Europe are at greatest risk as 70 to 80 % of all global flights operate [7]. Airlines have many special properties. It make applying the same financial and economical methods of accounting very difficult [2].

The aviation industry developed best practices and traits in the scope of financial, economics and IT [1,2]. Today, since the aviation industry market has been getting increasingly competitive, the cycle of production is getting shorter. New efficient and individually tailored project management methods are also developed and presented. All those aspects help to improve the quality of international aviation enterprises as the objects of property.

4.3.   RESOURCES OF AVIATION ENTERPRISES

World practice shows that, in a number of cases, large international airlines are entitled of ownership (full or partial) on a surface infrastructure in airports of basing, and in the world's major hub airports (hubs), the most prestigious terminals can be used on an exclusive-rights by airlines – members of international aviation alliances. Material resources, providing activities of international airlines, are complexes of technical maintenance and repair of AP and ground handling aircraft, which provides loading and unloading aircraft, their fuelling, providing special fluids, cleaning, provision of catering services (catering). Condition, technical level and efficient use of these systems will eventually have a significant impact on the efficiency of the airline. What is more, finding the aircraft on the earth belongs to the unproductive part of cycle of receipt of profit of airline and, consequently, its reduction (due to the compression of technological chart and acceleration/co-ordination of repairs and planned forms of technical service with the production program of airline) allows a more intensive use of aircraft on the productive part of the cycle – with flight operations of commercial load. Efficiency of functioning airport complex to ensure take-offs, landings and aircraft parking is determined not only by the time of standing aircraft on the ground, but the waiting time

of aircraft in the air (in the "circle" airport) before permit landing and opportunity of performing take-offs at the desired for the airline time.

The main type of AC's material resources as an object of property are aircraft, which is characterized by [5]:

- high unit cost;
- loss of use of off-label;
- making under a concrete order;
- protracted term of exploitation (25 years and more);
- necessity to register in the relevant state bodies [14];
- necessity to register in the relevant state bodies; for certification as a type of aircraft;
- considerable part of AP's world park exploiting by air-companies on rights for a lease (airlines have only rights for the use of such objects of property and rarely, the right to dispose of in any combination).

For determination of value of material resources, first at all, should be allocated significant economic factors that cause it to have reliable information. The market value reflects the real economic conditions which are folded at this market. Direct evaluation of real estate is to assess the value of the property rights of the owner (land, commercial real estate and so on).

Estimation of cost of the real estate, at first, is stipulated by the aggregate of objective and subjective economic factors. Objective factors include macro-and microeconomic. Macroeconomic factors include taxes, inflation, the exchange rate, the level and terms of payment of the unemployment rate, the development of export-import operations, etc.

Microeconomic factors are conditioned by objective characteristics of real estate object and legal features of mortgage agreement. Subjective factors have psychological nature, which is caused by the specific conduct of the seller, buyer or agent at the stage of conclusion of the agreement.

Value of real estate formed under the influence of market laws, in particular, relationship between demand and supply. Assessment methodology is based on the fact that the value of real estate can be related to its reproduction costs or revenues that may be derived from its use. The process of real estate assessment of the enterprise is to assess the value of the property rights and is based on a specific set of interrelated economic principles.

4.4. ASSESSING THE PROPERTY OF AN ENTERPRISE

In assessing the property of an enterprise, its price represents the market cost property of an enterprise, less the risk [8]. It is important when calculating the estimate of individual components of the property complex of the enterprise, which determine the value of the company.

To specify the real estate object cost in the first place should be allocated significant economic factors that determine it [13]. For example, evaluating the reconstructed objects calculated value of real estate for a particular investor. Insuring real property should enable calculation of the cost of replacement.

During considering the market value one need to assume that the buyer at the property market should be able to choose the alternative real estate, therefore the market value reflects the real economic conditions at the market [9]. Direct evaluation of the real estate is in the valuation of the property rights of the owner (land, commercial real estate, etc.) [12].

The theoretical basis for the assessment of the enterprise is interdependent set of specific principles that are divided into four categories:

1. Principles related to the assessment of buildings, structures, land and other property, which constitute a single property complex of the enterprise, are as follows:
   o the principle of residual performance, taking into account the availability of essential factors of production (labor, capital, management, and land), each of which is paid by the newly created value of this type of activity;
   o the principle of contribution (adding to the cost of the enterprise) provides increasing its value, which exceeds the actual costs;
   o the principle of increasing or diminishing returns means that as the resources to increase the basic factors of production net income tends to rise significantly by a certain date;
   o the principle of balance (proportionality) of the enterprise requires that the factors of production at the plant were balanced (ratio of primary and secondary production, main and auxiliary workers, etc.) in order to maximize revenue;
   o the principle of optimum size regards to any factor of production;
   o economic principle of division and association of property ownership based on the fact that property rights should be split and combine so as to increase general value of the enterprise.
2. Principles of enterprise users are:
   o the principle of utility consist in that the company has a value, if it will be useful to the owner in conditions of production of public goods needed for the market;
   o the principle of substitution means that the buyer will not pay for the company more than the smaller price of any enterprise with the same degree of usefulness;
   o principle of expectation answers expectation of future profits.
3. Principles associated with the external market environment, are as follows:
   o principle of dependence indicates that the nature of the economic environment, the national peculiarities and the international relationships affected to the value of the large industrial enterprises. This dependence is measured by time or cost of funds. The estimated enterprise also affects to the value of surrounding properties in the region;

      ○   correspondence principle means that the company must comply with market and town planning standards;

      ○   the principle of supply and demand takes into account the influence of the ratio between this components;

      ○   the principle of competition is that the increase of supply leads to a decrease in weight of income;

      ○   the principle of change comes from the fact that the value of the company influence internal factors, environmental and market environment. Therefore, the evaluators consider the cost on a specific date.

4. The principle of the effective usage of the property complex of the enterprise is a key in the evaluation of the cost.

Thus, the value of the property complex of the enterprise as collateral is the market value of the property business [10], less the risk, which can be calculated by using the following methods:

- comparison with the possible sale price – it is the method by which the collateral value is calculated on the basis of a comparison with the same real estate;
- evaluation in terms of business opportunities, in which the value of the collateral is assessed in the light of its importance for business development;
- estimates based on the expected costs when the value of the property is determined by taking into account the conditions of the value of its theoretical reconstruction.

In the future, based on the price of collateral, one should identify market risks [15], and its total cost, which would be less than the market price. Assessment will focus on the individual components of the property complex of the enterprise, which are determined value of the enterprise when deciding whether investment.

With this in mind, practice dozens of company valuation techniques that group on approaches. Techniques of the property approach based on the analysis of real assets and costs, so do not take into account the prospects of the company and used to assess the controlling shareholder of the company. Proprietary approach includes the following methods:

- asset accumulation enterprise, which is used to calculate the value of the enterprises that have substantial assets;
- to the adjusted book value (method of net assets), more frequent than all used in the process of privatization of state and municipal enterprises;
- calculate the substitution cost, that is, determinating of the current density or total cost based on the costs for the construction of the modern enterprise, which estimated similarly;
- calculate the residual value that is used to benefiting enterprises, as well as in cases when the cash flows from the production activity of enterprise are small in comparison with the value of its net assets, or the value of the enterprise in liquidation may be higher than its continuation.

Methodology of the income approach is based on the determination of the present value of future income, and include:

- income capitalization method, which is based on the capitalization of future income, as well as a normalized cash flow. It is used if the income of the company is stable;
- discounted cash flow method, which is based on the definition of income for each future year of the forecast period.

The main drawback of these methods is their speculative nature, which often based on false information.

Methodology of comparative approach to the assessment of enterprise are based on a comparison of the estimated value of enterprise compared with the cost of business and include the following:

- the methodology of the capital market, which is based on market prices of shares of companies such as the assessed;
- the methodology of agreements (comparative analysis of sales), based on an analysis of prices for acquired a control stake comparable companies in general;
- The methodology of industry factors (ratio), which is used for approximate evaluation of a company.

Presented methods cost of evaluation of enterprises are complementary, and therefore to assess the particular company uses several methods with different approaches, the results of which are compared to determine the final level of the assessed value of the enterprise. However, for example, to estimate the insurance value of an enterprise recommended to use the method of calculating value of replacement or adjusted book value method, when assessing the stable enterprise recommended to use income capitalization method, etc.

For a direct estimation used a number of concrete methodologies.

Let us consider assessment of real property (buildings and structures) [6]. In calculating the value of the buildings, which belong to the enterprise, you should consider the following elements: administrative building, corps of workshops, warehouses, economic apartments, cultural and household premises, as well as dwelling-houses. The composition of enterprise structures included elements such as waterworks, construction of transport and communication services, and other facilities (gas stations, coal bunkers, etc.), transmission facilities, pipelines. Naturally, during realization of value estimation of the concrete enterprise, the brought list of buildings and structures will be specified and complemented.

Evaluation of buildings and structures are based on the previously discussed principles (user, related to the market environment, best and the most effective use, etc.). The principle of assessment is usually used in combination. In the future, to assess buildings and structures of the enterprise can be used one or a combination of assessment methods: cost, income and household equipment and supplies. To assess the machinery and equipment three approaches are also used: cost, comparative and sometimes profitable.

The cost approach implies, as a base, the acceptance the full replacement cost and net of depreciation. Using the methods of the profitable approach is the most common method of residue which is being implemented in several stages:

- at the first stage from the property complex of enterprise allocated workshop which equipment needs to be assessed;
- at the second stage should be carry out calculations of the net profit of the enterprise that is attributable to workshop;
- further out of the net profit allocated part relating to the plot of land on which a workshop is located (eq. 4.1).

$$NP_{land} = V_b \times C_{land} \qquad (4.1)$$

where NP_{land} net profits earned due to the land;

V_{land} - the market value of the land;

C_{land} - capitalization coefficient of similar land parcels.

At the next phase of the estimated net income released the part that relates to the building of the workshop (eq. 4.2).

$$NP_b = V_b \times C_b \qquad (4.2)$$

where NP_b net profits derived from the exploitation of the building;

V_b - market value of the building;

C_b capitalization coefficient of similar buildings.

Further determination of the net profit by remainder that is attributable to the estimated equipment (eq. 4.3).

$$NP_{eq} = NP_W + NP_{land} + NP_b \qquad (4.3)$$

where NP_{eq} net income attributable to the estimated equipment;

NP_{land} net income that is attributable to the plot of land;

NP_b - net profit attributable to the building.

Finally, the estimated cost of the equipment determined by the direct capitalization method (eq. 4.4).

$$C_e = \frac{NP_{eq}}{CR_{eq}} \qquad (4.4)$$

where CR_{eq} capitalization ratio of similar equipment.

Important role in the implementation of investment operations, have an assessment value of the land of the enterprise. Can be used one of the main methods of assessment of land:

- method of comparative analysis, which consists in comparing the data relating to similar free land plots sold in the recent past. A comparison of the assessed land is carried out on the following elements: the conditions of financing of the agreement and sale, time of sale, location, physical characteristics, characteristics of income (profit) derived from the land;
- transfer method, which is divide the total sales price of comparable property complex on the price of the building and the price of the land. In the beginning it is necessary to estimate the cost of building and other structures on the site, and then from the blanket price of complex to subtract the cost of building and structures.

The methods of assessment of current assets. In assessing of the reserves should be considered raw materials, low value items, work in progress, finished goods, goods shipped, the costs of future periods. In assessing the reserves should be considered raw materials, low value items, work in progress, finished goods, goods shipped, the costs of future periods. These current assets on the balance sheet using the average cost method, the cost of first-time purchases (FIFO), the cost of the most recent purchases (LIFO). It is also necessary to take into account the actual cost of transportation and storage resources. Work in progress should be assessed on the actual cost of production, and goods shipped based on market value. Deferred expenses are valued at face value.

Methodology special start and periodically evaluating the capital value of the property complex of the enterprise should be subjected public examination for the protection of investors or in dealing with these issues in the arbitration committee. Assessment is carried out according to the formula presented in eq. 4.5.

$$V_{in.p} = R + Ci_a + R_v + C_u + I_{lt} + (B_c + F_a - A_p) \qquad (4.5)$$

where the $V_{in.p}$ – is the value of the property of the integral property complex;

Rc - remaining cost of the fixed assets taking into account indexation of their book value on the state;

Ci_a – the residual value of intangible assets as presented in the balance sheet;

R_v - replacement value of outstanding capital investments;

C_u . - the replacement cost of uninstalled equipment;

I_{lt} - long-term capital investments;

B_c - costs and reserves that go into the balance-sheet;

F_a - financial assets (cash, payments and other assets);

A_p - accounts payable (long-term liabilities, settlements and other liabilities, reserves and future costs of payments).

The financial assets (F_a) consist of long-term investments, diverse fixed assets, funds and cashes [3]. Herewith the financial assets are reducing to sum of payable (credits and others borrowed funds, cashes with creditors, goods and services, other liabilities). If sum of payable is more than sum of working funds, it means that possession worth is: presented in eq. 4.6.

$$V_{in.p} = Rc + I_a + R_v + C_u + I_{lt} \qquad (4.6)$$

For international airlines elements of resource support are the intangible resources, which are unique by their origin, because they don't have tangible physician form but have worth instead. They are spots, routes between cities/airports and connected with their exploitation the possibility of using airspace of concrete states. Known, that airline has the right to flying just after permission from representative government agencies of take-offing, flying and landing, and regular flights, just if there is an appointment from this airline at this route from government of two states on the strength of intergovernmental agreement about air announcement, that sets the conditions and, in number of cases, size of air freight between states.

Property of enterprise analyzes with indicators of condition, direction and effectiveness of using main means characterizes indicator: fixed-asset turnover, capital intensity and return on assets. Analysis does in compare method.

The financial status is the complex of indicators, which shows availability, location and using of the financial resources. The analysis of financial position of the company consists of the structure analysis and the dynamic of assets and liabilities, and analysis of the financial coefficient do in compare method.

Predominance of part from own capital is the positive factor of the financial status of the companies. The more own cash there is in the companies, the more stable and independent from external sources their financial status is. On the basic of this information about structure of the financial resources can be identified the indicators of the capital structure of international Fleet vehicles – coefficient of independence, financial stability and financial leverage, that calculate the proportion of funding of the company activity from own and external sources, and characterizes their financial status.

The coefficient of the financial independence, calculated as a proportion of the sum of the own cash to the total sum of the company cash, shows enough stable financial status of Ukraine industry companies, because critical (minimum allowable) value of coefficient is in the interval from 0,5 to 0,6.

The coefficient of the financial independent just partly characterizes the financial status of the companies. The excess of the own cash under the loaned and borrowed is a premise to the stable financial status of the companies. Because of it, means that value of coefficient of financial stable is characterized the independence of the companies from creditors must be more than 1. Even so the industry companies of the Ukraine are enough independent from the external financial sources, and long-term credits are little using for the capital raising, even so the financial independent of the companies must be

supported with enough of own cash for supporting the stable work and possibility to expand the company.

About providing the Fleet vehicle with own cash, evidence the coefficient of wide, supporting with own cash, manoeuvrability. So, the wide coefficient (proportion of working capital) is calculated as the proportion of the working assets to the short-term obligations, shows having the working capital in the companies that is necessary to expand the activity volume. The higher the coefficient is, the more there are own working capital in the companies to support their future activity.

Critical coefficient value is 1 and it means that the company can pay for the current debts. For not just paying for the current debts, but also for having resources to expand the activity, value of coefficient must be more than 1. The minimum allowable value of coefficient is from 1 to 1,5.

The coefficient of providing with own cash as a proportion of difference between volume of the working cash sources and the own sources, and the factual cost of main funds and other fixed assets to the sum of working cash shows availability the own working cash in companies, necessary for their financial stability and finances with own cash. Consider different minimum allowable values of the coefficient – from more than 0,1 to more than 0,6 – 0,8.

The coefficient of manoeuvrability calculated as a proportion of difference between the working cash and the short-term liabilities to the sum of own sources, shows which part of the own cash is invested in the most mobile assets. On the basic of minimum allowable coefficient value, which is 0,3-0,5, we can assure that in the companies in the most mobile assets is invested a small part of own cash.

It indicates about the large shortage of own sources for investing.

About it indicates the wide coefficient that is less than 1. Not having enough the own working cash, companies using as a source of investing in the economic turnover the payable.

The rate method of the financial stability of companies can include analysis of the next indicators:

- capital, sources of profit and costs;
- structure of the financial operations of companies (outstanding debt and other obligations, liquidity)
- quality of the financial control and clear of the financial plan (budget), system of financial accounting and auditing, and also the process of planning;
- management the capital, level of the company autonomy, competition and pricing;
- distribution of income and profit, product quality;
- the composition of tax, and adequacy of the fixed tax rate to the condition of the company activity.

The common object of the financial status analysis is getting the indicators, which allow objectively rate the financial status of company.

The common tasks of the financial rate analysis of company are:

- rate the responsibility, liquidity, ability to pay, the financial stable and the ability to compete of company;

- determine the effectiveness of using financial resources;
- rate the position of company on the financial market;

Liquidity of an enterprise – is its ability to discharge the liabilities in time. The analysis of liquidity is based on the comparing of the volumes of current liabilities with working capital of the company.

Ability to pay – is the ability of company to make continuously essential payments to provide the activity

Financial stable is the company, that with own cash covers the funds invested in assets, prevent unnecessary receivables and payables and pay in time for its obligations.

For to rate the financial status of company is four levels of indicators:

- first level – profitability, that shows the effectiveness of economic activity of the company (total capital profitability, economic and financial profitability, total profitability from the production fund and others)
- second level – coefficents of market (financial) stability: index of the immobilized assets, coefficient of the autonomy, coefficient of the security with own working capital, coefficient of the per cents covering;
- third level – rate of the liquidity: current coefficient of the liquidity (of total wide); the critical liquidity coefficient (intermediate cover); the absolutely liquidity coefficient;
- forth level – ability to pay: sum of the own working capital, the working capital quota, rating the long-tern ability to pay;

During the evaluation the company calculates absolutely liquidity to the begin and end of the reporting period, the ability to pay and the financial stable [17].

The coefficient of the absolutely liquidity (C_{al}) calculates as a proportion of fund S_m in the accounts and in hand, and also the short-term investments Bк (securities and other profitable assets acquired for a period of up to one year) to the sum of short-term liabilities (eq. 4.7).

$$C_{al} = \frac{(S_m + I_{st})}{C_{gp}} \qquad (4.7)$$

The coefficient of absolute liquidity represents that part of short-term debt that the company can to pay for in the near future. The coefficient of absolute liquidity is sufficient at a value more than 0.2 (eq. 4.8).

$$C_p = \frac{C_p}{(C_{gp} + F_c)} \qquad (4.8)$$

When the value of the total coefficient of the payment ability is 0.5 and lower the company-debtor is insolvent.

An important task of analyzing the financial status of the company is studying its financial stability. For the conditions of the market economy uses balance model of financial stability is presented in eq. 4.9.

$$M_c + F_i + F_{m,sti.p} = O_{cs} + S_{tl} + D_f + L_t + C_{al} + A_p + O_l \qquad (4.9)$$

where M_c – main capital;

F_i – investments;

$F_{m,sti.p}$ – cash, short-term investments, payments, receivables;

O_{cs} – sources of the own capital;

S_{tl} – short-term loans;

D_f – debt funds;

L_t – outstanding in the loan term;

C_{al} – calculations;

A_p – payables;

O_l – other liabilities.

Based on the analysis of balance model of the financial stability and based on the proportion of the working capital, own and long-term debt sources of inventory and costs, economists have concluded that there are four types of possible financial stability of the company [13]:

- absolute stability as a very favorable type of the company financial health in a market economy;
- normal stability of the company that guarantee its ability to pay;
- precarious financial status accompanied by disturbances ability to pay, but with the possibility of its stabilization through replenishment of the sources of own funds and the increase of the own working capital;
- the financial crisis status, close to the bankruptcy.

  Prediction of the bankruptcy is possible on the basis of five-factor Altman model (Z-score), which includes following indicators at the beginning and end of the year:

- proportion of the working capital in the company assets – C_{ass};

- proportion of retained funds of company assets (profitability of the assets) - P_a;

- the proportion of profit from the sale to the company assets – $C_{p.ass}$;
- the proportion of market worth of the common and preferred stocks to liabilities of the company – $C_{st.l}$;

- the proportion of sales volume to the company assets – $C_{vs.ass}$ (eq. 4.10).

$$Z = 1,2C_{ass} + 1,4P_a + 3,3C_{p.ass} + 0,6C_{st.l} + C_{vs.ass} \qquad (4.10)$$

Features of the stable financial status of the company are: stable ability to pay, having the optimally necessary need in the working capital, their effective using, the right organization of the calculations, having the stable financial base.

Analysis of financial-economic activity is associated with the substantiation of business plans, under the control of their realization in the marketing system, in realization market-oriented air services. Futures of the management analysis are:

- orientation of the analysis results on its leadership;
- using of all sources of information for analysis;
- absence of the regulatory of analysis;
- the complexity of the analysis, the study of all aspects of the fleet vehicle activity;
- the integration of accounting, analysis, planning and decision making;
- maximum secrecy of the analysis results in order to maintain the trade secret.

4.5. CONCLUSIONS

Characterizing the activities of air transport companies necessary to use the following system of indicators of their financial-economic activities: the volume of products transport: the consignments volume, the volume of air and non-aeronautical services, passenger turnover, freight turnover, reduced brought turnover; Technical: carrying capacity, capacity, production capacity, capacity of amortization and mechanization, economic: revenue, earnings, direct and indirect costs, profit, profitability; quality and efficiency of the operating processes: air income per passenger, non-aeronautical revenue per passenger revenue per passenger revenue per employee, net assets per employee. The cited figures analyzes by the methods of structural and comparative analysis and also factor analysis.

Indicators of status and efficient using workforce include: productivity, efficiency and quality of work. The analysis of the status and effectiveness of human resources in the company [18] effected by determining the directions of changes in the dynamics of values - that is, by comparison.

Interconnection and logical consistency of the above parameters proves that there is objective conditions to ensure effective ownership or beneficial use of property rights subject without any subjective influence on his part as a structural change, the introduction of innovations, alternative approaches to the organization of management.

According valuation of property is recommended by the following order:

1. Calculation of indicators by groups and testing the accordance to the requirements.
2. The determination of the points of compliance (full compliance – 1 point, partial – 0.5, non-compliance – 0 point).
3. Getting the average estimated indicator of the object quality of ownership by the total number of points to the maximum possible.

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5

THE INTANGIBLE ASSETS FORMING IN THE PROCESS OF COMPANIES' INTERACTION BETWEEN AIRLINES, AIRCRAFT REPAIRING COMPANIES AND AIRCRAFT BUILDING COMPANIES

The article considers the forming of intangible assets in process of companies' interaction between airlines, aircraft repairing companies and aircraft building companies. Approaches to the economic effectiveness of resulting effects from companies' interaction of aircraft industry are also presented.

5.1. PROBLEM STATEMENT

In the current economic situation the economic conditions of companies are determined not by the idea of having physical assets and debugged production processes, supply and sale, but by the idea of ability to create and realize the innovations. It is requires a revision of the traditional approaches of management, development of new criteria and methodology that meeting to modern requirements. The principal difference of high-tech companies is that their market value is formed mainly due to the knowledge of the staff, know-how, innovative technologies, inventions, industrial designs and other intangible assets.

Ukrainian scientists highlight the various problems of implementation of companies interaction between aircraft industry and air transport enterprises. But despite the multilevel and depth of the research, the problem of evaluating the effectiveness of the implementation IA of companies interaction is not enough studied.

The purpose of the study is to develop approaches for assessing the cost-effectiveness the implementation NMA of companies interaction between airlines, aircraft building and aircraft repairing enterprises.

5.2.   ANALYSIS OF RECENT RESEARCH

The analysis showed that the individual problems of assessing the effectiveness of intangible assets in the interaction of the aircraft industry are solved in the works of Russian scientists such Arefieva [1-3], Astapova [4], Bobin [5], Koba [12], Kuliev [13] and others. Aspects of reconstruction of airworthiness of aircraft and related logistic support are studied by Novilova [14], Panchenko [18], Podrez [19], Polyanskaya [20], Tamargazin [26-28], Chichkan-Hlipovka [6] and others.

Over the past 20 years, new product areas, insourcing and outsourcing activities and innovative forms of cooperation between companies were developed [25]. It was achieved mainly due to industries expanding their boundaries. This expansion almost covered traditional industry boundaries and developed tightly related industries economy. What is more, the industry's interaction scope still expands, proper mechanisms and activities are developed [26].

One can often observe [11n, 21] that an industry's integrative activities are more profitable than traditional economy. It is highly correlated with the nature of the coordinating these activities [22].

The main focus on the industry analysis is put on a company's external dimensions, like markets, customers, and competitors [7, 28, 23]. Research conducted on the industry showed the strong influence of economic structure on competition and cooperation [9] as well as on the strategic industry control, and the industry factors influencing profitability [11].

Research are also conducted on the influence of external changes on a company's strategy of such factors like changing customer needs, new technology, government policy, globalization, and economic cycles affect [26, 10]. Strategic planners develop analytical tools supporting use of external information to help create proactive strategies [25]. As a result, the importance of understanding the internal industry structure has been minimized [17, 24].

5.3.   INTEGRATION OF BUSINESS PROCESSES

Consider the stages of the formation IA in the process companies interaction [15]. These include the following (figure 5.1):
- Inventory results of intellectual activities (IA) over a certain period, which is directly related to the validity period of intellectual property (IP)
- A portfolio of IP, which includes the identification results ID, subject to legal protection, a form of protection and foot access to the information contained in concrete results ID;
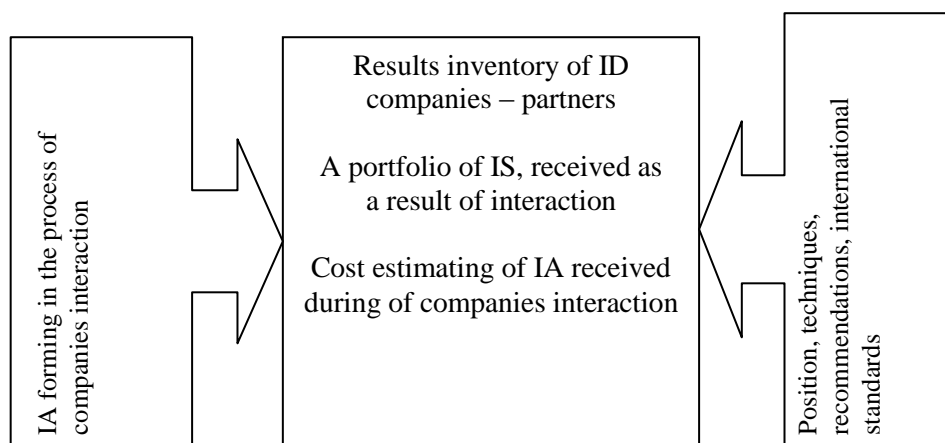- Implementation of cost estimating IA.

Fig. 5.1. Stages of IA forming in companies interaction

The first and most important step towards the formation of intangible assets of the company is inventory results IDs, which are the basis of IA. In assessing the IP are two fundamentally different types of intangible assets – identifiable and identified (goodwill).

Intangible assets that are identified are exclusive property rights to intellectual property - IP law. IP objects can exist separately from the enterprise, that is, the possible sale of each IP object separately. Thus, we can talk about their reflections on the balance sheet of an enterprise as separate accounting units have a certain value.

IA can not be identified, their distinguishing feature is that they are associated with the business on the whole. It does not include identified IA, goodwill organizational and management structure (organizational capital) [16], production standards, and are inseparable from the individual, the knowledge and experience of employees (human capital), databases, information systems, networks and IT (information capital). IA can not be identified, encourage customers to continue to use the services of the company and bring her income beyond what is provided reasonable income to all assets that are identified. Determining the value of intangible assets can not be identified, is the most difficult procedure to assess the value of the company. Note that not identifiable assets can not be acquired for the money, they should be created within the partner companies for the period of joint activity. The possession of these assets provides to partner companies a significant advantage over their competitors. Realizing typical assets that can not be identified, the synergistic effect of interacting businesses are able to increase their competitive advantage. Table 5.1 presents data on intangible assets of companies around the world. According to table shows that constitute the greater part of IA the assets of Company [2].

Table 5.1 The share of IA in companies of different countries

Assets forming cash	Share in % of companies in North Europe	Share in % of companies "old members" of the EU	Share in % of companies in East Europe	Share in % of companies in USA	Share in % of companies in South-East Asia	Share in % of CIS companies
Tangible assets	10	25	30	12	20	65
Intangible assets (IA), including:	90	75	70	88	80	35
Trademarks	30	20	20	30	20	15
Technological IA	20	20	20	30	30	10
Strategic IA	10	10	10	15	15	5
Human IA	15	15	15	10	10	5
Social IA	15	10	5	3	5	2

Value of intangible assets is their strategic priorities of partner companies. If intangible assets are fully consistent with the strategy, their value for the cooperating companies increases significantly. Developing and integrating intangible assets with strategic processes, partner companies ensure cost of intangible assets. Relationship IA, which are not identified with other processes shown in fig. 5.2.

Though such structure is not very popular in European IIBSs it is obviously more preferable than the ones based in the USA. One of the reasons of such difference in the views is that as a rule American companies more depend on the internal market than the European ones. Therefore the attainment of "critical mass" allows their international departments to gain strength.

Productive organizational structure (figure 5.3) that is popular in companies that work with diversified groups of products such as for example "Motorola". More often the productive groups are completely independent from each other even in internal production of the country. It is necessary to note, that at the same time different branches in one State should report on the management of different productive departments in headquarters [11].

The next stage in the development IA is the process of creating an effective IP portfolio of partner companies. Essential in the process of creating a portfolio of IP partner companies has scientific and technical policy of enterprises, aimed at protecting the rights to create products, increasing production costs and the transfer of the exclusive right to manufacture the identified IP objects.

The final stage in the process of formation of IA interfirm interaction is assessed. In a number of the basic approaches to the assessment IA, but virtually no attention from the problem of assessing the synergistic effect that occurs in the process of inter-firm cooperation.
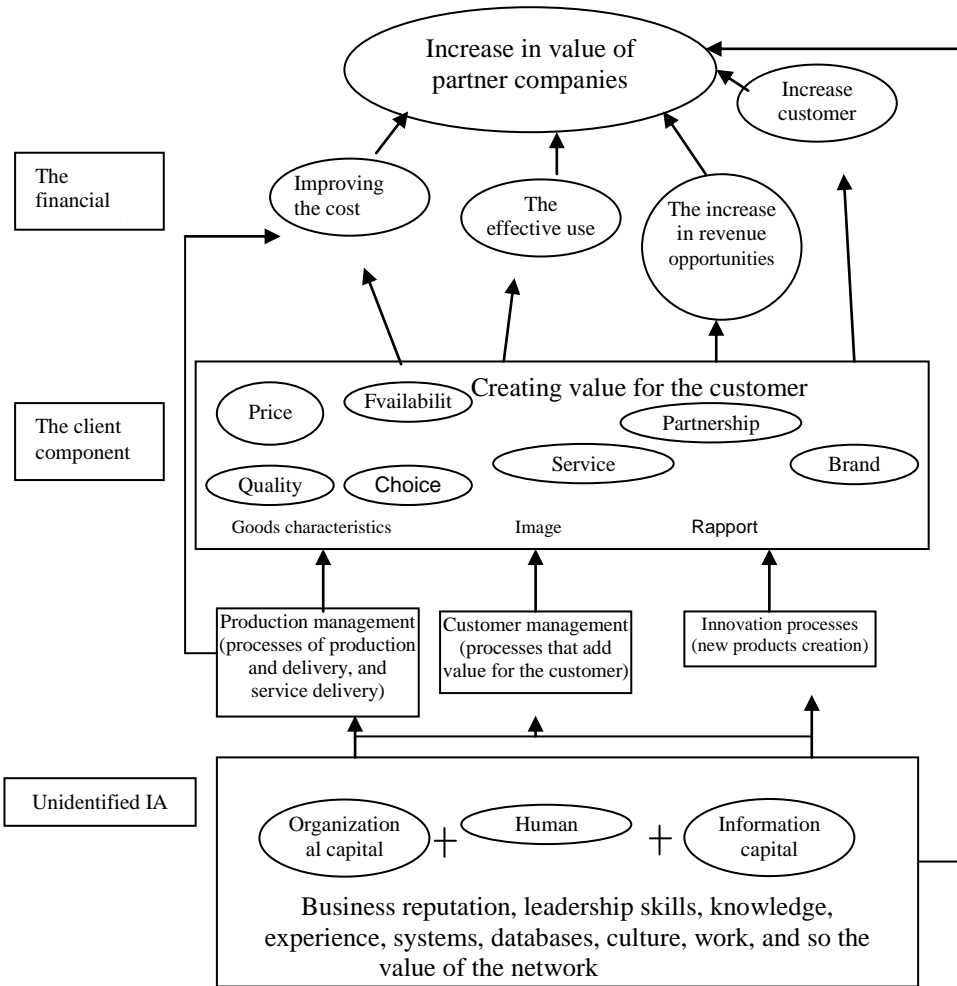
Fig. 5.2. Interrelation of IA can not be identified with other processes of partner companies

In the business environment for the synergies realize benefit resulting from the combination of two or more elements so that the performance of this combination is higher than the sum of the performance of its individual elements. In general, the synergistic effect is manifested through: the transfer of know-how (the participants, working in specific works combine their innovations), the sharing of resources (this leads to cost savings, eliminates duplication), creating benefits by gaining time through the division of work; gain as by sharing works; gains of better conditions to attract debt capital because of the high prestige of program participants, the growth of consumer confidence in the final result, the gain in spending lesser amount of scale implementation outcomes.

Synergistic effects may occur both directly and indirectly. The direct effect of an increase cash flow, and indirectly – to increase shareholder value by combining increase the attractiveness to investors [8]. The two distinct types of synergistic effects (fig. 5.3).

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┌─────────────────────────────────────┐
│          types of synergies         │
│                 |                    │
└─────────────────────────────────────┘
        ↓                       ↓
┌──────────────────────┐  ┌──────────────────────────┐
│ Operating synergy:   │  │ financial synergy        │
│ - Reduction of       │  │ - Mutual insurance debt; │
│   production costs;  │  │ - Increase in the market │
│ - An increase in     │  │   value of companies;    │
│   operating income;  │  │ - Reducing the cost of   │
│ - Optimization of    │  │   capital.               │
│   production         │  │                          │
│   capacity.          │  │                          │
└──────────────────────┘  └──────────────────────────┘
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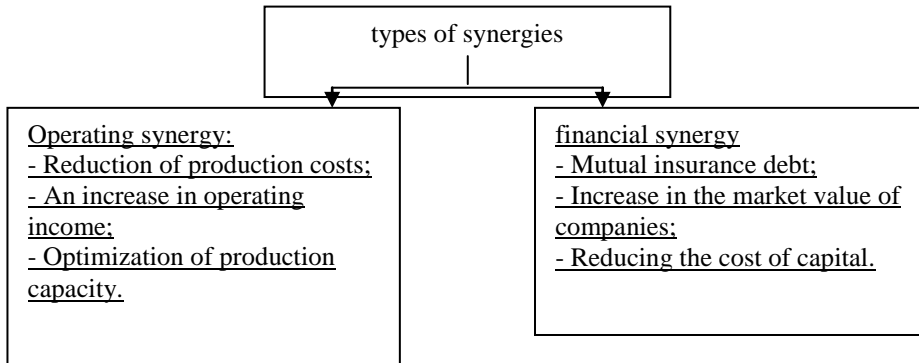
Fig. 5.3. Types of synergy effects in inter-firm interactions

To characterize the economic efficiency of business aircraft industry enterprises in this article, were introduced the notions of synergy effects of the first and second order.

The synergistic effect of the first order (E1 - the interaction of individual units in the system of the company) presents eq. 5.1.

$$E_1 = F - \sum_{y=1}^{Y} A_y - D \qquad (5.1)$$

where F – forecast the current market value of an aviation company, AY – current market value of the asset y-enterprises; D – debt (liabilities) of the enterprise.

Synergistic effects of the first-order reflects an excess of forecast market value of aircraft operating on a total fair market value of its assets less liabilities and due to the effective organization of in-house management tools that provide the most beneficial use of existing assets and managing investments. Thus, the synergistic effect of the first order (E1) is based on a systematic approach according to which the aviation enterprise is regarded as a functioning system consisting of interconnected elements. Synergetic effect of the second order presents eq. 5. 2.

$$E_2 = F - \sum_{z=1}^{Z} A_z - c \qquad (5.2)$$

where F – forecast the market value of the corporation; Az – current market value of z-th entity in the corporation, with the cost of incorporation; C – system approach, scientific and industrial corporation is the system the next level. Its elements are companies that, in turn, are also addressed in the form of systems. Thus, the establishment of a corporation is accompanied by a synergistic effect of the second order.

By analogy with the presented synergistic effect, we consider the synergistic effects, reflecting the inter-firm cooperation at the level of enterprises and countries.

Synergistic effect of the third order (E3 - cooperation of enterprises in strategic alliance) presents eq. 5.3.

$$E_3 = F - \sum_{v=1}^{V} A_v - c \qquad (5.3)$$

where the F – forecast the market value of the alliance, AV – V-current value of the company, which is part of the alliance, V – the number of companies entering into alliance with - coordination costs to support the alliance.

At horizontal interaction of inter-firm resources, capabilities and core technology of companies and organizations combines to achieve the best result. With horizontal cooperation firms gain access to new and additional technologies, accelerate learning processes in the firm is reduced by, the division of costs and risks of research, using economies of scale, access to new markets and production equipment, as well as control the development of alternative technologies. The main prerequisites of integration associations, strategic partnerships is the desire to raise revenue. In this case there is a synergistic effect of inter-firm cooperation (E3)

The synergistic effect of the fourth order (E4) – interaction of groups alliances at the international level is presented in eq. 5.4.

$$E_4 = F - (\sum_{b=1}^{B} A_b + \sum_{d=1}^{D} A_d) - c \qquad (5.4)$$

where F – forecast the market value of an international alliance, AL – current market value of alliances b-th country, AD – current market value of alliances d-th country, with – coordination costs at the international level.

The synergistic effect of the fourth order (E4) represents the excess of the cost of an international alliance of the total value of the alliance companies cooperating countries and due to the cooperation of groups of companies in global markets. With increasing globalization, developing a new form of competition: competition between groups of alliances. Within a network or a group of different companies can be associated with one of a variety of means of alliances, from the formal structure of a joint stock company to informal cooperation agreement. Companies can take advantage of newcomers promising technologies and adapt quickly to market needs are changing.

The concepts of synergy effects 4.1 orders can extend the classification of intangible assets and improve their evaluation scheme in the calculation of the market value of high-tech enterprise or project implemented by a group of companies.

Economic and mathematical model (eq. 5.5) enables us to formulate a general criterion of performance management solutions.

$$VE(u) \to \max_{u \in U} \qquad (5.5)$$

where U - a set of alternative management decisions;

VE (u) - concern value (the project) in the implementation of the administrative decision of the set U.

This means that the company's management or alliance should take the management decisions that maximize business value.

Thus, in the market value of the company or project that can be implemented as one or more undertakings must include the value of intangible assets, which at first glance looks like the eq. 5.6.

$$C_{IA} = C_{IA(accounting)} + \mathring{A}_1 + \mathring{A}_2 + \mathring{A}_3 + \mathring{A}_4 + \mathring{A}\hat{e} \qquad (5.6)$$

where SIA has - the value of intangible assets;

SIA is (accounting) - the cost of intangible assets (which are not always reflected in the financial statements); Synergistic effects of 1-4th order, due to the interaction; EC - externalities (spillovers), partly controlled by management companies.

Let us consider the measure EC - externalities. Externality (external effect) is the action of market transaction for a third party. When inter-firm cooperation there is a relationship between the institutional structures that appear, and the adoption of a particular firm, is expressed in the effect of the network. If returns in cooperative research on the contribution of firms involved in the alliance, then there is the effect of accession to the majority (positive externality). A negative externality occurs when most companies decide to get out of the alliance in order to create innovative products for yourself. Then the impact of cooperation in the average decline, reducing the tendency of enterprises to join the alliance.

It should be noted that (6) gives only a rough estimate, because it does not take into account the probabilistic nature of the parameters that determine the value of assets. However, on the way to solve it, a number of major problems: the main - is the lack of mathematical models for specific intangible assets. In order to manage the assets you need to know the purpose of management and be able to influence the characteristics of the asset, which determine the degree of achievement of the required cost and efficiency. There are a lot of admissible control, which is described by an appropriate set of control parameters. Then the opportunity to influence the characteristics of the asset, which determine the degree of achievement of goals, formalized as the choice of the control parameter.

If the alliance is conducted development and modernization of the AO in the number of parameters are, at least, the technical parameters. The presence of common parameters are common to all alliance and independent parameters that characterize one of the companies is the cause of correlation of their assets. In this case, to calculate the probability of assets (including intangible) of the alliance can not use a simple multiplication of the absolute reliability of the assets of individual enterprises. The formula for calculating the conditional probability of the assets of the alliance is presented in eq. 5.7.

$$P_A = P_1 P_{2/_1} P_{3/_{1,2}} \ldots P_{\eta/_1} \ldots \eta - 1 \qquad (5.7)$$

$P_{2/_1} P_{3/_{1,2}}$ - The conditional probability of the assets of the enterprises, and the very possibility of the PA will be conditional;

Analytical solution for the calculation of PA (7) is very complex, because it requires the construction of the conditional distributions of assets of each company and the further integration of their product.

To solve this problem is proposed algorithmic method, PA, which provides a numerical value for any assets distributed enterprise $\varphi(\overline{T}), \varphi(\overline{E})$ and the presence of correlation between the two, the correlation coefficients, which are characterized by the matrix [r_{ij}].Block diagram of the algorithm for calculating the conditional probability of the assets of the alliance is presented in figure 5.4. The initial data are the distribution $\varphi(\overline{T}), \varphi(\overline{E})$ each company, the matrix [r_{ij}]and restrictions on the company's assets. After reset the counter suitable implementations begin statistical tests of mathematical models enterprise assets $A_i = \varphi_i(\overline{T}, (\overline{E})$.

For this simulated random values (C.3) parameters $\overline{T^*}$ и $\overline{E}^*$ with their correlations, which are substituted in the mathematical model of the first asset A1 (fig. 4). If A1 * - random value satisfies the given constraints, a transition to the calculation A2 * for the same set of $\overline{T^*}$ и $\overline{E}^*$ and so on up A_η^* . If at least one of the parameters A1 * does not satisfy the given constraints, there is a return to the beginning of the cycle, modelled the new sequence C. 3. $\overline{T^*}, \overline{E}^*$, and calculated ones corresponding C.3. Ai *. Unit to the meter suitable implementations N1 is added only if all the values of A1 * A2 * satisfy the appropriate restrictions. After the end of the statistical test determined the numerical value of the conditional probability of assets alliance PA.

The algorithm is based on the statistical tests and provides a numerical value of the conditional probability of the assets of the alliance. The advantages of this algorithm are:

1. Independent of the presentation of the mathematical model assets. Such a model can have an analytic form, to be a kind of algorithm or be functionally complete software module, which is well-known within the action determines the assets of the enterprise.

2. Regardless of the shape and parameters of the statistical distributions of technical ($\overline{T}$)and economic ($\overline{E}$) parameters. Such distributions may be empirical and given as a histogram.

3. Mainstreaming correlations technical ($\overline{T}$) and economic ($\overline{E}$) parameters. The correlation between technical ($\overline{T}$) and economic ($\overline{E}$) parameters can be either twin or multiple.

4. In general, when using the method of statistical tests, the accuracy of the result can be any higher, it just depends on the amount of statistical tests.
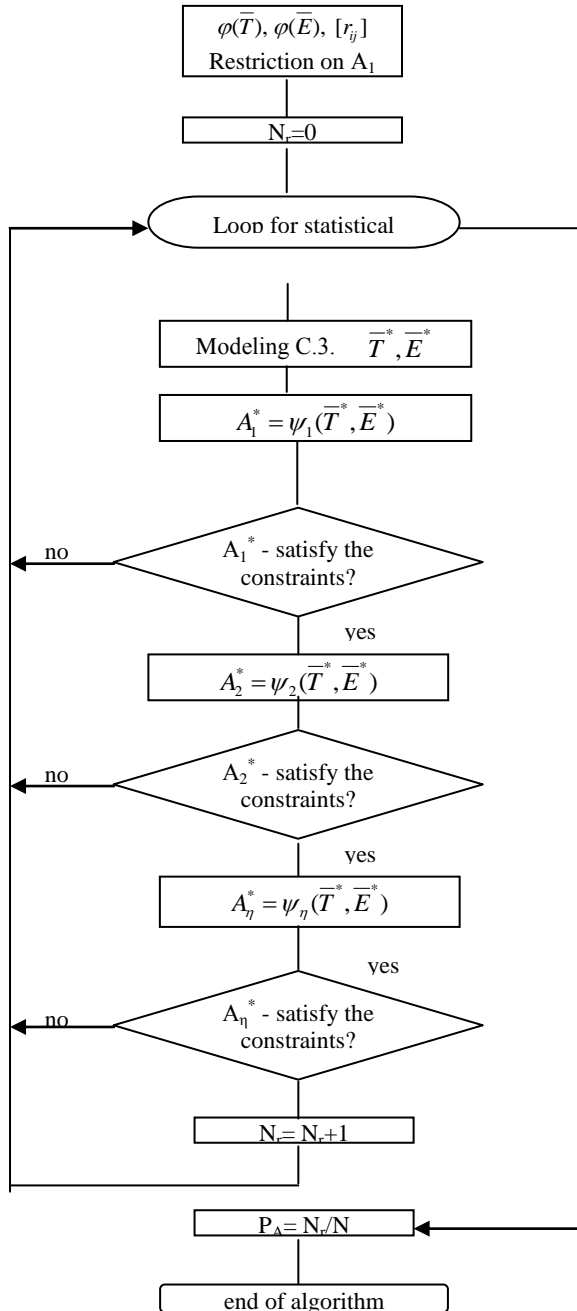
$$\boxed{\begin{array}{c} \varphi(\overline{T}),\ \varphi(\overline{E}),\ [r_{ij}] \\ \text{Restriction on } A_1 \end{array}}$$

$$\boxed{N_r = 0}$$

$$\left(\text{Loop for statistical}\right)$$

$$\boxed{\text{Modeling C.3.} \quad \overline{T}^*, \overline{E}^*}$$

$$\boxed{A_1^* = \psi_1(\overline{T}^*, \overline{E}^*)}$$

A_1^* - satisfy the constraints? — no

yes

$$\boxed{A_2^* = \psi_2(\overline{T}^*, \overline{E}^*)}$$

A_2^* - satisfy the constraints? — no

yes

$$\boxed{A_\eta^* = \psi_\eta(\overline{T}^*, \overline{E}^*)}$$

yes

A_η^* - satisfy the constraints? — no

$$\boxed{N_r = N_r + 1}$$

$$\boxed{P_A = N_r / N}$$

$$\boxed{\text{end of algorithm}}$$

Fig. 5.4. The calculation sequence of the conditional probability of attracting assets in inter-firm collaboration

Algorithm to maximize the conditional probability of the assets based on the previous algorithm. Its block diagram is shown in Figure 5.5. After modeling set C.3. $\overline{T}^*$ и $\overline{E}^*$ interval defined by the interval of a random variation of the parameter, which gets the appropriate C.3. Next, as in the previous version, to verify compliance with limits for each parameter Ai *, in the event that all the Ai *, i = 1,., N satisfy the given constraints of the interval to the meter, which got value or added value 1. The process looks like a histogram parameter. As a result, after the statistical test out "histogram" parameters $\overline{T}_i, \overline{E}_i$ peaks which correspond to their optimum value by a maximum of PA. To verify the solutions should be repeated simulation algorithm (figure 5.6) by setting the nominal new optimal values. $\overline{T}_i^{opt}, \overline{E}_i^{opt}$ The advantage of this algorithm is its high speed.

It allows you to get the best result, that is, to conduct parametric synthesis by maximum likelihood assets directly in the statistical analysis.
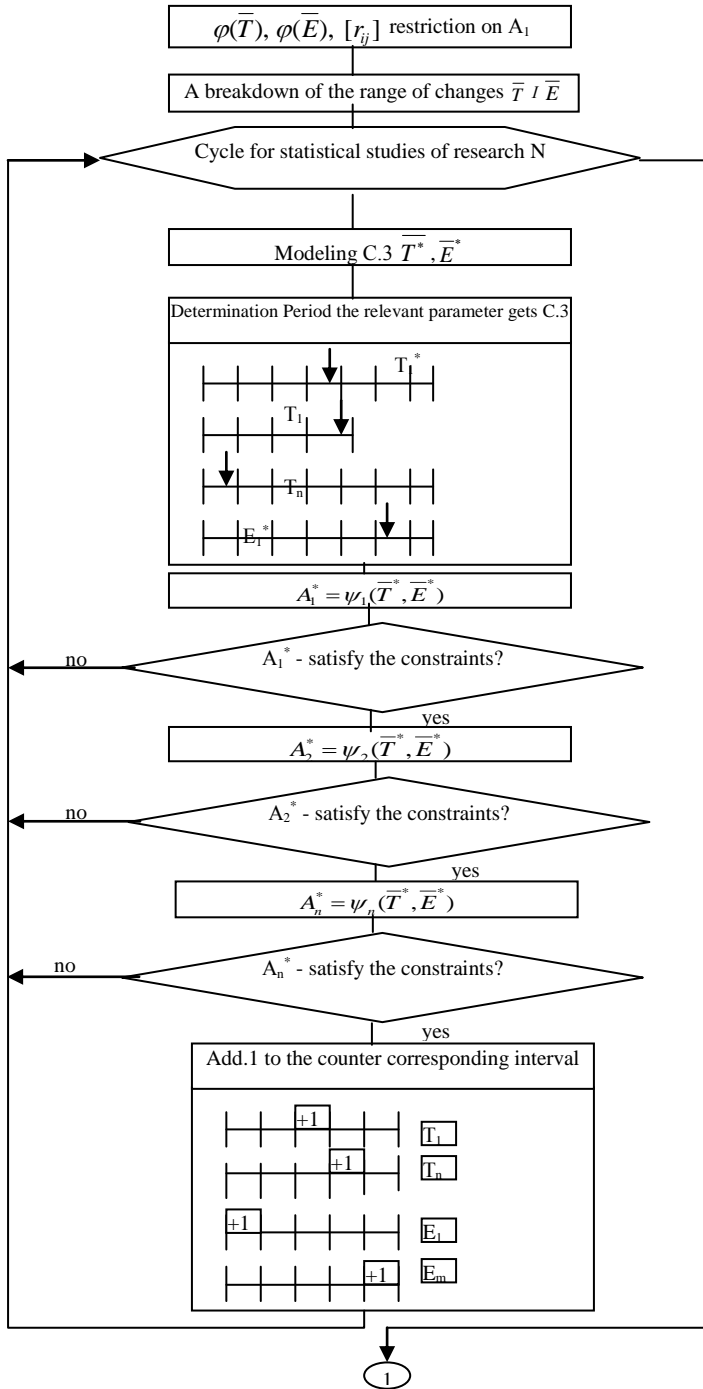
Standard optimization procedures involve calculating the probability of alliance assets at every step search. As for the calculation of the objective function at each step of the search method of statistical tests, an optimal solution requires a lot of processing, there is a time-consuming.

As an algorithm for determining the conditional probability of the assets of the alliance, the algorithm synthesis by maximum likelihood invariant assets as a form of presentation of mathematical models of business assets, as well as to the form and parameters of the statistical distributions of technical ($\overline{T}$) and economic ($\overline{E}$) parameters of interaction between enterprises.

Classification of the synergistic effects and algorithms, the reliability values of assets given interacting enterprises, which allows you to find the numerical values, provide a reliable assessment of their contribution to the long-term value growth companies that can effectively manage the processes of creation and commercialization of AO.

During the interaction creates income, which is obtained from the sale of products created. In this regard, there is a matter of assessing the contribution of resources and the distribution of proceeds from the sale and / or commercial use of AO.
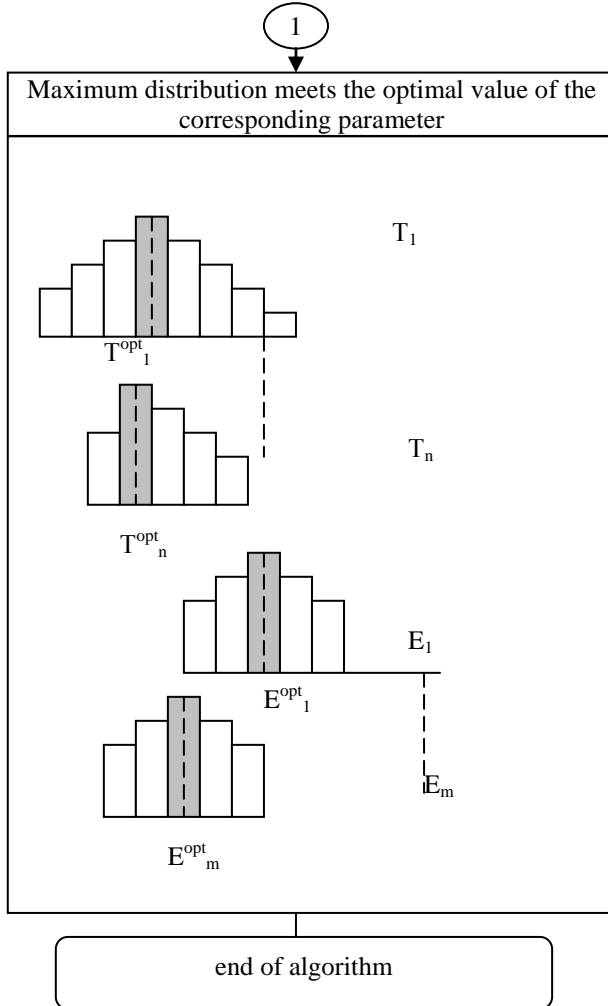
$\varphi(\overline{T}),\ \varphi(\overline{E}),\ [r_{ij}]$ restriction on A_1

A breakdown of the range of changes $\overline{\overline{T}}$ *I* $\overline{E}$

Cycle for statistical studies of research N

Modeling C.3 $\overline{T}^*,\overline{E}^*$

Determination Period the relevant parameter gets C.3

T_1^*

T_1

T_n

E_1^*

$A_1^* = \psi_1(\overline{T}^*,\overline{E}^*)$

A_1^* - satisfy the constraints?   no

yes

$A_2^* = \psi_2(\overline{T}^*,\overline{E}^*)$

A_2^* - satisfy the constraints?   no

yes

$A_n^* = \psi_n(\overline{T}^*,\overline{E}^*)$

A_n^* - satisfy the constraints?   no

yes

Add.1 to the counter corresponding interval

+1 T_1

+1 T_n

+1 E_1

+1 E_m

1

Fig. 5.5. Sequence of maximizing the conditional probability of attracting assets in intercompany collaboration

Consider the evaluation task of the contribution of partner companies using Lagrange multipliers. In this case it is useful to consider some production model, which is described on the example of a multiplicative function of the Cobb-Douglas function, depending on the resources that are owned by different companies (eq. 5.8).

$$Q = A \cdot R_1^{\alpha_1} \dots R_n^{\alpha_n} \cdot P_k = A \prod_{i=1}^{n} R_1^{\alpha_1} \cdot P_k \qquad (5.8)$$

In this case, the cost function is of the form presented in eq. 5.9.

$$C = \sum_{i=1}^{n} w_i R_i \cdot \frac{1}{P_k} \tag{5.9}$$

Lagrangian function can be written as the form in eq. 5.10.

$$\Phi = \sum_{i=1}^{n} w_i R_i - \lambda (A \prod_{i=1}^{n} R_1^{\alpha_1} \cdot P_k - Q_0 \cdot P_k), \ Q_0 = A \prod_{i=1}^{n} R_1^{\alpha_1} \tag{5.10}$$

The production function has the property presented in eq. 5.11.

$$\frac{\partial Q}{\partial R_i} = \alpha_i \frac{Q}{R_i} \tag{5.11}$$

And then the job evaluation of the contribution is reduced to a system (eq. 5.12)

$$\frac{\partial \Phi}{\partial R_i} = w_i - \lambda \alpha_i \frac{Q}{R_i} = 0, \ i = 1,...,n; \ Q_0 = A \prod_{i=1}^{n} R_1^{\alpha_1} \tag{5.12}$$

from eq. 5.13:

$$w_i R_i = \lambda \alpha_i Q, \ i = 1,...,n \tag{5.13}$$

Then the Lagrange multiplier can be expressed in this way, and then substitute the expressions for the other resources (eq. 5.14).

$$R_i = \frac{\alpha_i w_1}{\alpha_1 w_i} R_1 \tag{5.14}$$

Substitute them in relation to a fixed volume of production (eq. 5.15).

$$Q_0 = A \prod_{i=0}^{n} \left(\frac{\alpha_i w_1}{\alpha_1 w_i} \right)^{\alpha_i} R_1^{\alpha_i} = A R_i^{\sum \alpha_i} \prod_{i=0}^{n} \left(\frac{\alpha_i w_1}{\alpha_1 w_i} \right) = A R_i^{\alpha} \prod_{i=0}^{n} \left(\frac{\alpha_i w_1}{\alpha_1 w_i} \right), \ \alpha = \sum_{i=1}^{n} \alpha_1 \tag{5.15}$$

And we find the contribution of each participant (eq. 5.16, 5.17).

$$R_i = \prod_{i=0}^{n} \left(\frac{\alpha_i w_1}{\alpha_1 w_i} \right)^{\frac{\alpha_i}{\alpha}} \left(\frac{Q_0}{A \cdot P_k} \right)^{\frac{1}{\alpha}} \tag{5.16}$$

$$R_k = \frac{\alpha_k w_1}{\alpha_1 w_k} \cdot \frac{\alpha_1}{w_1} \prod_{i=0}^{n} \left(\frac{w_i}{\alpha_i} \right)^{\frac{\alpha_i}{\alpha}} \left(\frac{Q_0}{A \cdot P_k} \right)^{\frac{1}{\alpha}} = \prod_{i=0}^{n} \left(\frac{\alpha_k}{w_k} \frac{w_i}{\alpha_i} \right)^{\frac{\alpha_i}{\alpha}} \left(\frac{Q_0}{A \cdot P_k} \right)^{\frac{1}{\alpha}}, \ k = 2,...,n \tag{5.17}$$

5.4.   CONCLUSIONS

Evaluation of the contribution by the example of the Cobb-Douglas function, but any other function of the proposed approach does not undergo any change.

The study presented the approach for assessing the cost-effectiveness the implementation NMA of companies interaction between airlines, aircraft building and aircraft repairing enterprises. Economic effectiveness approaches regarding effects of companies' interaction were also presented.

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6

FACTORS THAT INFLUENCE THE CHOICE OF ORGANIZATIONAL STRUCTURES OF MANAGEMENT IN INTERNATIONL BUSINESS STRUCTURES

The article presents results of investigations of organizational structures of management in international integrated business structures (IIBS) functioning. The international experience of organizational IIBS structures and its influence on the processes of economical development are analyzed. Moreover, the modern peculiarities of organizational IIBS structures choosing are determined

6.1. PROBLEM STATEMENT

IIBS is one of the most widespread form of large international business organization and it plays a leading role in the modern world economics [5]. It control the main part of the total world industrial production as well as the main part of the world goods and services trade. The problem of choosing organizational structures for international integrated business structures is rather important both [6-7]: management, international companies owners and for administration in total as solving of this problem on the one hand can help to consolidate the state of IIBS in international market [16-17] and on the other hand it will help to increase the owners income at the result of increasing of potential value of international integrated business structure.

Structural changes in IIBS and their influence on potential value of a company have rather considerable impact both in the conditions of modern economic development and the international financial and economic crisis. Because, as practice proved, even at the initial crisis stage the overwhelming majority of IIBSs, including the ones that are based in Ukraine, declared the preparation and realization of the programmes of operational and financial restructuring and then with different levels of successfulness introduced a number of measures for business adaptation to the new circumstances. However, the matters of choice and appropriateness of management organizational structure in

conditions of conducting of operational restructuring and effective functioning of IIBSs stay insufficiently investigated.

The purpose of the article is to disclose the factors that influence the process of choosing the organizational structure of IIBS and also to provide a short description of both positive and negative characteristics of organizational structures of management that IIBS use.

6.2.   ANALYSIS OF RECENT RESEARCH

In the process of investigation, while formulating theoretical conclusions and practical propositions, the author used the works of native and foreign scientists and specialists such as: Belozubenko V.S. [1], Kirichenko O.A. [8], Makogon Y.V. [11], Kudelya A.D. [10], Blank I.A. [2-4], Smith A. [18] and others.

The modern theory and practice of management believes that the organizational structure of the IIBS must, above all, ensure the implementation of their strategy. Along with the change in strategy there is the necessity of change in organizational structures. Category "structure" shows the structure and the internal shape of system and represents relatively stable relations that exist between the elements of organization. Connection of the elements in the structure is subjected to the dialectic relationship of part to whole. The presence of the structure is an essential attribute of all real systems, because the structure in particular gives them the integrity, help to maintain the stable state of the system. [12-13]

There are many definitions of organizational management structure, each of which makes a significant contribution to the understanding of organizational management structures IIBS. Here are a few of them.

Structure IIBS, which shows the synthesis of the various components that operate to achieve the desired result, is called organizational.

The organizational structure of IIBS is a construction of organization that serves as a basis for the management of IIBS. It has either a formal or informal expression and covers two aspects [6]:

1) channels of authority and communication between various administrative services and workers;

2) information that is transferred through these channels.

The organizational structure of IIBS must meet certain requirements [15]:

- Adaptability (ability to adapt to changes in the environment);
- Flexibility, dynamism (the ability to respond accurately to changes in demand, the emergence of innovations);
- Adequacy (compliance the organizational structure with the control system parameters);
- Specialization (functional isolation of sub-units, specification of scope of activity);
- Optimality (the presence of a rational connections between the levels and links of government);

- Efficiency (avoiding of irrevocable changes in the controlled system in a time of decision-making);
- Reliability (warranty of reliability of information transmission);
- Economy (compliance of costs for the management maintenance according to capabilities of the organization);
- Simplicity (ease of understanding and adaption to this form of management for the staff).

Construction of the organizational management structure of IIBS is affected by system of factors that relate to the object and the subject of management [15]:

- size of industrial activity of IIBS (medium, small, large);
- production profile of IIBS (availability of expertise in the production of one type of product);
- product description and technology of its production (mass, mass production);
- area of interest of IIBS (focus on the local, national, foreign markets);
- the scope of the foreign operation and the shape of its implementation;
- nature of the association (concern, financial group).

The main principles for the formation of organizational management structures of IIBS is: unity of purpose, the primary function and secondary structure, simplicity of organizational structure, the unity of leadership, the optimal span of control, the principle of feedback, etc.

6.3.   INTEGRATION OF BUSINESS PROCESSES

Globalization processes, informatization of the society, increasing of dynamics of the management area and other integration processes are becoming the basis of introduction of the new model of economical development of national economics. Besides the conditions of competitive confrontation are getting more sophisticated, the additional barriers for national manufacturers going out to the international market are created. One of the ways of solving these problems is expansion of integration processes and initiation of business combinations.

Under such circumstances very actualized become the necessity of examination of predominant methods and technologies of integration realization that are implemented into informatization of all processes within the limits of integration formations, organization and foundation of effective organizational and legal form of IIBS, enhance of the efficiency of management and productivity of integration structures activity. Economical integration of business companies in modern circumstances are determined by formation of financial and industrial capital. The financial and industrial capital is the integrated form of industrial, financial and intellectual capital, it has its internal structure of interaction that allows to realize most effectively the process of consolidation of investment resources for the further development and improvement of management and production process. Integration of industrial, financial and intellectual capital is based upon a conception of production that together with specialization, cooperation,

combining and diversification define integration of establishments and serve as the basis for getting synergetic effect. It means that consolidation of financial and industrial capital as an essential condition of production concentration determines the direction and ways of investment resources formation that directly influences the effectiveness of investment management comparing with other forms of organization of different business units. Integrational processes are displayed in appearing of new characteristics in obtained integrity, due to development of establishments in inseparable connection of integration and disintegrative processes.

So, from the point of view of economical system of integration we can consider both the association of economical subject and broadening connections between them [3] or as dynamic process of liquidation of discrimination [1], creation of favourable for each of them circumstances of realization of economical activity [3] and intensification of interaction for more effective use of exclusive competitive advantage [4] and obtaining of synergistic effects. With that, integration can be compared to industrial cooperation, the definition of which is provided in terms glossary of United Nations Economic Committee for Europe. In such circumstances the strategic integration will be observed as relations between the establishments that are based on long-term community of interests [4].

Integration of corporative structures can be realized by the following methods [9]: financial (capital concentration), organizational (production concentration); management (creation of a certain system of participation/ controllability) ways of coverage (creation of certain territorial formations).

Under creation of corporative structures by financial ways we mean financial take over or control of work of separate business units with the help of the following operations: purchase of other company's capital, purchase of all net wealth of another company, derecognizing of another company's liabilities; purchase of a part of assets of another company, together they form one or several types of business. And formation rigidity (the force of ownership relations) is defined in tough IIBSs. All participants of such IIBSs belong to owners or franchisers for more than 75% (qualified majority) is an agreement concluded between the establishments, that gives the franchiser an opportunity to dictate its decisions to affiliate company. In soft (diffused) IIBSs the situation is the following – in integrated ownership there are controlling interests of establishments-participants and large shareholdings that give the opportunity to influence the decision making (they cannot reach 50%, but as a rule they reach this limit in Ukraine).

Under creation of corporative structures by organizational ways we mean organization of coordination between structural elements. It can be submitted to manufacturing process (that can be realized by concentration, specialization, cooperating, combining, diversification of the production) or it can be oriented for maximization of consolidated profits (independently from the contribution of separate participants of integrated cooperation).

6.4.   INTERNATIONAL ACTIVITY OF IIBS

Under creation of corporative structures by management ways we mean formation of a certain system of participation/controllability of separate business units of business in total. Such process can be realized by 6 ways: with the help of consecutive takeover or obtaining of control under companies which are connected by one business type; by combining the establishments of a common technological cycle; by the way of consecutive creation of establishments and their further takeover to integrated structure by combining of not certain companies but integrated structures; by the way of "division" of large companies with their restructuring.

Therefore IIBS management can be realized by ownership method when one of participants (central element) has enough rights of ownership. This is a classical IIBS of holding type. Structures of holding type are distributed in it. Such IIBSs are based on the system of mutual participating. Or it can be realized by management method when the amount of rights of ownership enough for deciding the important issues and control under some participants of IIBS consists in the realization of functions of executive board for other its members (providing of the total complex of management services), providing financial and investment services [4], administration of procurement and distribution, lobbying and guaranteeing of the government support. Structurization of management is realized by the following method: the managing company performs as IIBS or operative administration is realized by permanent executive board, or accordingly to the type of organization structure (linear, functional, product, divisional or matrix one), using the corresponding management methods (management of people, processes, activities and projects). According to the existing degree of management rigidity the corresponding degree of consolidation is realized. Such degrees are the following: consolidation on the level enough for guaranteeing the effectiveness of management process, equal or formal consolidation. That is why the different participation system of separate members is assumed. It can be pure holding (realization of control and financial functions); mixed holding (a participation of management body in operative administration is assumed additionally to the system of pure holding); contract integration (within conditions of institutional theory).

Under creation of corporative structures by territorial methods we mean organization of integrated business structures of the following types: transnational IIBSs; national IIBSs; regional IIBSs; cluster formations; corporative establishments. According to the level of IIBS occupation (macro-, meso-, microlevel) different levels of connection with the government can be realized for these structures: governmental integrated corporative structures; based on transmission of governmental property to the new individual ones; based on transmission of governmental property to the existing individual ones; the ones with considerable part of governmental property; the ones created for realization of certain governmental project, the ones with insignificant part of governmental property. The various incentives are acceptable for establishment of balance of forces and balance of power between separate marketers: the contract that can be considered as an agreement about transmitting or protection of property rights [4], the establishment of legally restricted institutional borders [6].

Depending on the intension of interaction between the subjects of integration one of three types of contracting can be used: classical, neoclassical, the one based on relations and one of the variants of international control: the one using the complete ownership or through the system of agreements. Such interrelation can be viewed as the scope of complete short-term contracts of interchange and subjects of integration as long-term incomplete contracts concluded by the owners of capital assets and labour force [6]. The combination of variants of contracting and level of independence of the members create hybrid structures. The choice of organizational structure of management that is the result of interaction of a number of elements including places of location and type of foreign combined establishments, their influence on the total effectiveness of the work, character of assets used for doing business outside the country of location and prospect of achievement of goals of international activity and common aims of IIBS is rather topical at present moment [6].

IIBS should determine the status of its subsidiaries and choose the organizational structure according to the common direction of development. The structural plan of choosing and building for each country should be individual, taking into account characteristics of subsidiaries activity, specificity of conditions of functioning and external environment of each country. The level of taxation, expenses and control depend on forms and methods of operations conducting, placement of production divisions in the country of location and abroad.

In such a way all variants of international activity of IIBS can be joined together (for example, within the limits of international department or division) or grouped by types of production, similar functions or regions analogically to the structure of IIBS in the country of location (Figure 6.1).
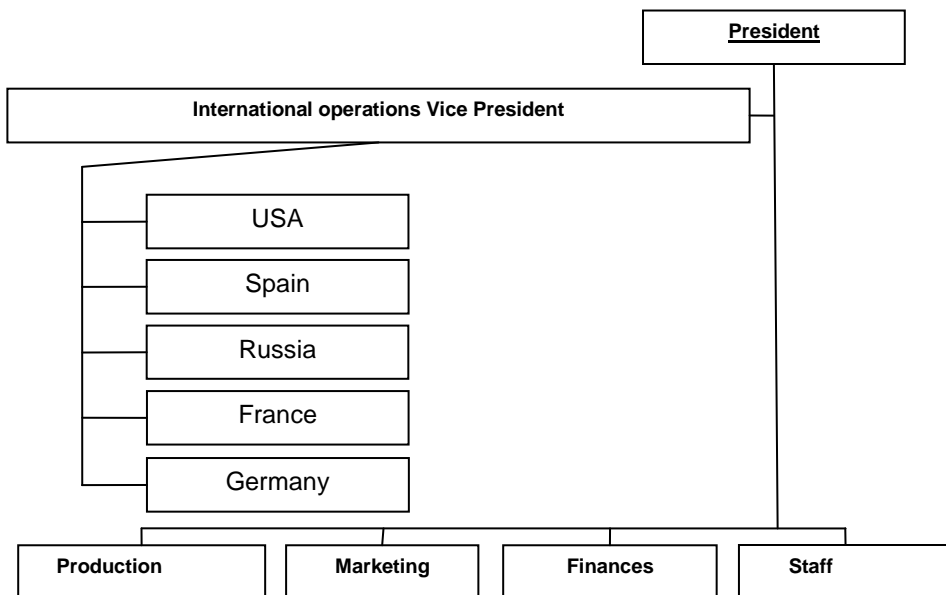

Fig. 6.1. Organizational structure on the early stages of internationalization [7]

Organizational apportionment of international operations allows the employees with special training work with such issues as execution of export documents, bargaining of currency transaction, establishment of relations with government of foreign countries. However, combining all international operations together, the corresponding department may obtain enough of "critical mass" to have influence in IIBS [5].

If international activity will be distributed among usual production or functional departments it can be so insignificant comparing with doing business in the native country that the company mostly is not interested in its development. Its separation will lead to the settlement of strong relations between international department and internal departments that are occupied in output of products, staff management, technologies, etc. (Figure 6.2).

```
                                            ┌──────────────┐
                                            │  President   │
                                            └──────┬───────┘
        ┌──────────────────────────────────────┐  │
        │      International departments        │──┤
        └───────┬──────────┬──────────┬─────────┘
        ┌───────┴───┐  ┌────┴────┐  ┌──┴──────┐
        │    USA    │  │  Japan  │  │ France  │
        └─┬─────────┘  └─────────┘  └─────────┘
          │   ┌──────────────────────────┐
          ├───│    Business manager      │
          │   └──────────────────────────┘
          │   ┌──────────────────────────┐
          ├───│    Marketing             │
          │   └──────────────────────────┘
          │   ┌──────────────────────────┐
          └───│    Government Affairs     │
              └──────────────────────────┘
┌─────────────┐  ┌─────────────┐  ┌─────────────┐  ┌─────────────┐
│ Production  │  │  Marketing  │  │  Finances   │  │    Staff    │
└─────────────┘  └─────────────┘  └─────────────┘  └─────────────┘
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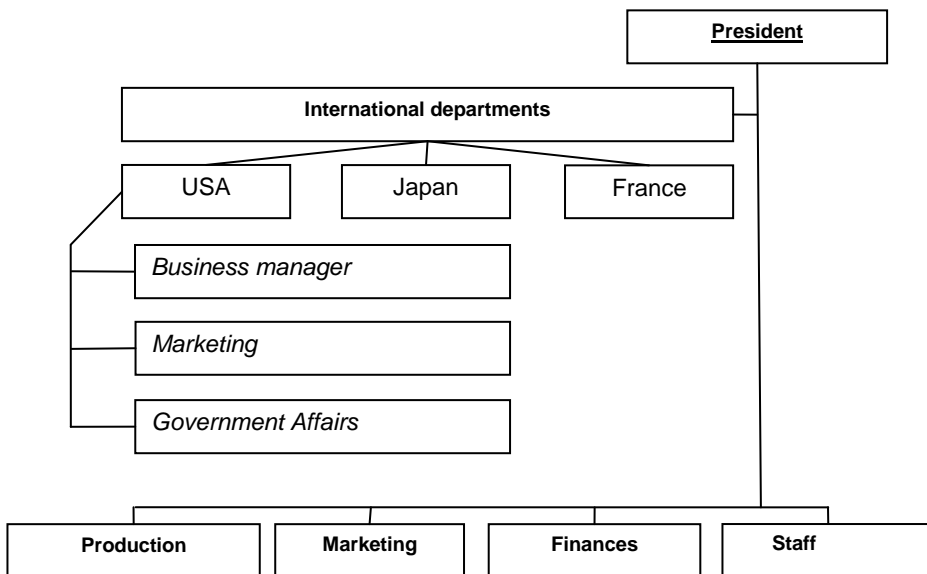
Fig. 6.2. The implementation process of the pre-integration stage of SME economic integration

Though such structure is not very popular in European IIBSs it is obviously more preferable than the ones based in the USA. One of the reasons of such difference in the views is that as a rule American companies more depend on the internal market than the European ones. Therefore the attainment of "critical mass" allows their international departments to gain strength.

Productive organizational structure (Figure 6.3) that is popular in companies that work with diversified groups of products such as for example "Motorola". More often the productive groups are completely independent from each other even in internal production of the country. It is necessary to note, that at the same time different branches in one State should report on the management of different productive departments in headquarters [9].
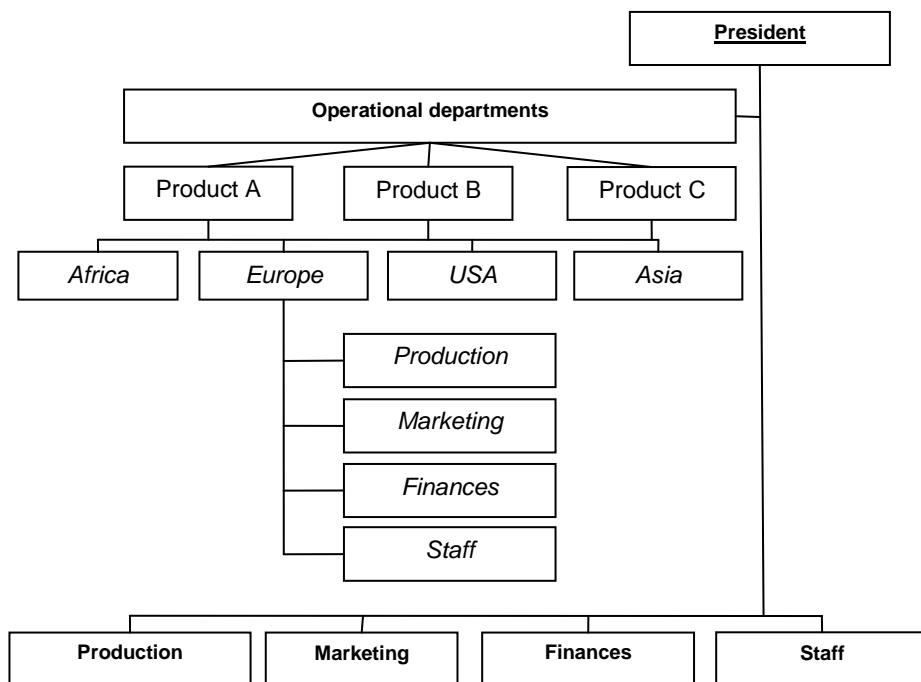
Fig. 6.3. Global productive divisional structure [10]

Organizational structure built by geography (Figure 6.4). It is popular first of all in IIBSs with highly developed international operations that do not have domination of some definite country or region. It was determined, that such structure can be more often found among European IIBSs such as "Nestle" than among the American ones in which the internal market has greater importance. IIBS can use such organizational structure as none of the regions has advantages in operations.
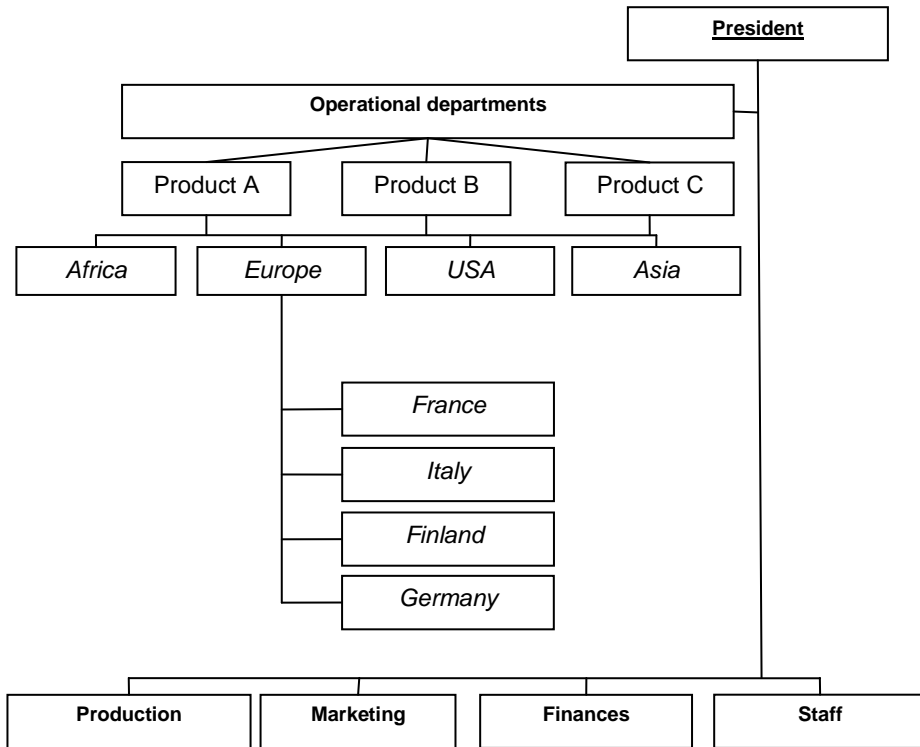
Fig. 6.4. Global regional divisional structure [16]

Functional structure (Figure 6.5) is used first of all by companies that do mining operation as their products are highly similar ant therefore methods of production and marketing in countries are mostly the same. Such structure for example is used by "Exxon Mobil" Oil Corporation [16].
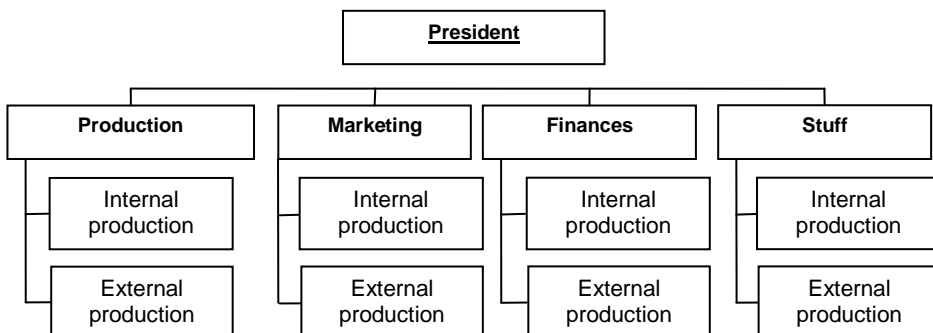
Fig. 6.5. Global functional structure [7]

Because of the problems characteristic for integration or apportionment of foreign operations in the form of independent subdivision it is appropriate to choose matrix organizational structure. In organizations of such type the foreign branch reports to more than one group (productive, functional or regional). Theoretically as each group shares the responsibility for international activity with other groups it depends upon them. The groups become more interconnected, they begin to exchange the information and finally striving to regulate the resources exchange each of them works out global strategic prospects (Figure 6.6).

Matrix form of organizational management structure allows in the process of making of strategic decisions to take into consideration all main market prospect and to be more flexible than other structures, but it also has its disadvantages. The main problem of matrix form of organizational management structure is the fact that subordinate has not one head but several ones. And that is why he has to set priorities according to his own preferences. The other problem of this organizational structure is that each group or coalition inevitability starts a confrontation for the scarce resources and when the heads of lower levels cannot reach a consent, it is necessary to make management decisions and to allot the resources on the higher level than the group one. As a result, in the process of making corporative decisions there can be not at all represented the exact fields of activity that could represent the best global strategic choice.
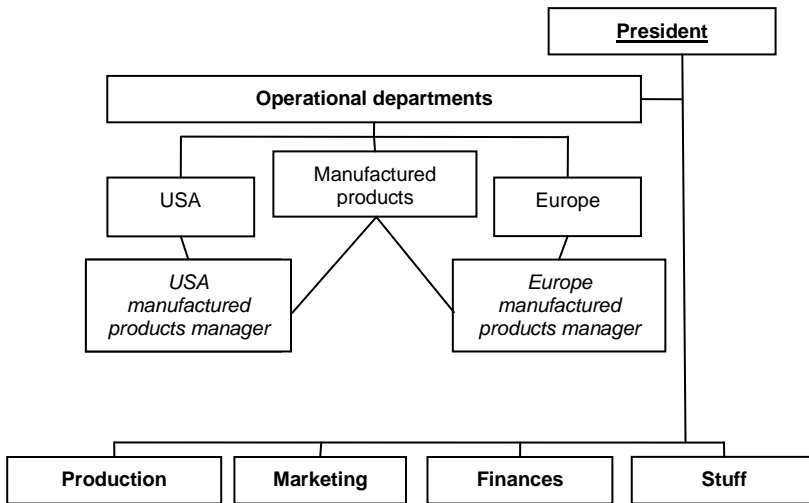

Figure. 6.6. Multinational matrix structure [6]

Accordingly, the advantages of matrix structure are neutralized by discrepancy between the levels of IIBS management. Separate methods help to solve the management problems partially. They are in particular: regular redistribution of employees between the groups and working out of additional systems of reporting and

control that reflect the needs of each group (productive, functional and regional) on the global level. However, their usage involves the additional costs [6].

6.5.   CONCLUSIONS

The author has indicated the positive and negative points that occur in the process of choice, practical introduction and functioning of organizational structures of management of IIBS.

It is defined, that in choosing of organizational structure for IIBS it is necessary to take into account the following eternal environment key factors [14]:

- governmental regulation, governmental authorities;
- tax and general legislation, licensing;
- monetary and credit policy;
- relations with other countries;
- share market development;
- availability of credit resources;
- availability of State projects and requests;
- traditions of business realization and management;
- branch peculiarities and so on.

Internal environment key factors:
- preference of persons concerned (top-managers, owners and so on);
- level of necessity of organizational structure flexibility;
- peculiarities of product group, realized by the company;
- amount of the staff;
- availability of corresponding computer hardware, new technologies of management;
- development and availability of communication equipment and so on.

Taking into account these factors will allow to reduce and optimize the expenses for IIBSs management, will lead to increase of effectiveness of their functioning and will allow to increase the level of the economical development.

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7

FACTOR OF INNOVATION CULTURE IN MOTIVATION OF MANAGERS' CREATIVITY

The article describes the feasibility of consideration of innovation culture as a factor of motivating managers' creativity at domestic enterprises. It highlights the main motivational aspects of innovation culture: functions, values and principles that develop creativity of top management. Typology of management work in conjunction with motivation is proposed. The main tasks which prove the important role of innovation in encouraging creativity of management.

7.1. INTRODUCTION

Nowadays we are witnessing the weakness of the system of stimulation of innovation activity and encouragement of searching of the new technological solutions, what substantially decreases the scales of innovation developments and their implementation in the production. Thus it is necessary to systematically consider the conditions and problems of innovation development on the level of enterprise in the context of motivation of the managers' creativity which we will consider in the light of innovation culture.

The purpose of the article is to prove the feasibility of consideration of innovation culture as a factor of motivating managers' creativity at the domestic enterprises.

7.2. ANALYSIS OF RECENT RESEARCH

Analysis of the latest researches and publications testifies substantial interest of the scientific world to the problems of innovation and motivation as separate objects of research. Innovation theme embraces rather wide spectrum of questions to certain extent connected with motivation of innovation work [2;4;7;10], intellectual assets [1;10], innovation culture and innovation processes [5;6]. It should be mentioned that the

Ukrainian school of management also offers the examination of the fundamental notions of the creative management from the point of view of systematic approach [8] and from the point of view of the culturological tendencies [9]. Of great importance are the works, which reflect the humanitarian aspects of management, particularly synthesis of organizational culture and management in corporations [3], management aspects of the innovation culture [5] and management of the personnel motivation in general [4] are also of great interest. But these scientific directions are researched autonomously and do not reflect the complete conception of improvement of innovation dynamics of our economics. Thus, we must admit that researches of the stated problem by the domestic scientists are insufficient, they are unable to deeply reveal the problem of activation of the innovative processes, not limited only by economic factors, but to reveal it through the aspects of innovation culture and creative management.

7.3.   INNOVATION CULTURE

The qualitative market transformation demand the formation of the modern style of thinking, creative filling of management solutions and stimulation of the creative searches and ideas. In the conditions of building-up of the economics of knowledge, the theory and practice of the motivation of working activity must develop in the direction of setting up the conditions for creative work, development of the creative thinking and search of the motivators, capable of supporting the desire to create new ideas. In its turn as a basis of the development of motivation system, capable to promote the creativity of managers there should be used innovation culture, which owing to its functions and values makes it possible to combine expectation principle and principle of result.

Innovation culture is a result of social and economical interaction of the entities of innovation activity, it embraces the relations forming along the whole chain of the life cycle, from the initiation, formation to the commercialization of innovations [6]. These relations are indirectly established through the appropriate value system, ethical orientations and responsibility system, that is why qualitative certainty as a specific system feature is inherent for innovation culture. The specifics of innovation culture is expressed through its duality, as it is simultaneously a special type of culture and at the same time the element inherent to any type of culture.

Feasibility of consideration of innovation culture as a specific factor of motivation for the management in development of its creativity is proved by the functional conception, according to which culture altogether is considered as a system of means for satisfying the demands generated by society. Every society functions in space of culture «programs vital activity of people and determines its socialized modes» [7, c.75]. In the frames of cultural space the demands and values of life activity are formed, the main motivators are cherished and general outlines of his behaviour are traced.

Each enterprise has its cultural space in which its personnel interacts and which determines its value orientations. Nowadays when the transition from an economic person to a sociable person is taking place, the knowledge and creativity put in a claim to

be values too - they are non-material assets, capable of increasing intellectual potential of an enterprise, develop corporative talents and guarantee its high compatibility.

If an enterprise possesses intellectual and creative potential, then its innovation activity will be successful. However carriers and implementations of the creative ideas (scientists, researchers, designers, technologists, production workers, idea generators, etc.) from time to time need some motivation. Creative potential as any other one loses its capabilities if not used effectively, that's why innovation culture is meant to become a stimulator in effective usage of creative potential. In the article a great attention is paid to particularly management personnel, as this is category of intellectual people who are carriers of creative ideas and at the same time the quickness and effectiveness of transformation of the idea in commercial result depends on their decision. The creative element potentially lies in the professional behaviour of the management as management decisions often require intuition, quick-wittedness, unconventional approach, especially in uncertain conditions, characteristic of present time.

Influence of innovation culture on the motivation of development of top management creativity is expressed through motivation and axiological functions. Motivation function characterizes system of principles and standards which regulate working activity of personnel. The value platform of a person is reflected by axiological function of innovation culture, which helps to produce certain standards and rules of conduct according to accepted values. Innovation culture through the system of values forms motivation structure of personality, which should be taken into account in the process of developing the motivation policy of enterprise and its philosophy. Values determine the perception of the forms of person's vital activity, whereas motivation structure of personality directly depends on the person's needs, which are derivatives of his values. The motivation structure will change in the process of satisfying different needs, reaching the goals and domination of values on a certain time period of a person. We can affirm that there exist objective laws of prosperity or decline of values according to the rate and quality of the progressive development of the society or its stagnation. As innovation culture embraces the aspect of progressive development, it is that favourable environment capable of expending motivation field and its parameters. Innovation culture is a foundation for developing creative thinking and approach to solving the management problems; it is a subject to transformation itself, because of this very creative impulse. Thus, the desire for self-realization, which can be reached through creativity, permanent striving for new ideas, nowadays is one of the biggest motivators.

As the process of creative search lasts permanently and leads to corresponding qualitative changes and organizational development, it is very important to distinguish one more sub-type in the environment of innovation culture – culture of changes, which reflects the level of personnel creativity and its potential adaptability to different organizational changes. Culture of changes transforms in culture of transitional processes, as any innovation testifies new quality, which is formed during a long period from the moment of initiation of idea to its practical introduction in production.

Taking all this into consideration, role of innovation culture in activation of the creativity of management becomes apparent , first, in the fact that it plays the function of stimulating creative thinking, second, expands the parameters of the motivation field of an enterprise, third, harmonizes relations of all participants of innovation cycle,

fourth, makes all the creative processes   look organized,   purposeful, regulating corresponding procedures, fifth, substantially decreases resistance to the novelty owing to culture of changes and transitional period, sixth, optimizes all innovation way of enterprise on the basis of adopted values and desire to work in advance.

7.4.   MOTIVATION OF MANAGEMENT CREATIVITY

Let's distinguish main tasks that prove the important role of innovation culture in motivation of development of management creativity. These tasks include: assistance in development of innovation ideas, stimulation of social and economic processes on enterprises, capable of changing value orientation of a person, optimization of all components of creative potential of enterprise, multiplying corporative talents; generation of ideas and their commercialization, increase of responsibility of the participants of innovation process, quality and effectiveness of creative process.

Management work should reflect not only formal and non-formal aspects of this work, but be characterized by creative initiative and potential ability to develop its creativity. Improvement of the effectiveness of the creative process of management are reached due to the well-thought motivation policy. In practical sense it is first of all necessary to form typology of works, fulfilled by management and then to choose dominating types of stimulators,   taking into account nature of work.

In Table 7.1 we offer possible list of works of the management and nature of motivation of personnel on enterprise.

Table 7.1 Combination of top management work typology with nature of motivation

Typology of top management work	Nature of motivation (dominating)
1. Design work (engineering and design, technological)	Collective reward
2. Resulting works (production, for example)	Personal reward
3. Functional work (marketing, personnel, finances, provision etc)	Personal reward, collective award
4. Creative and innovation works	Personal reward

Source: personal elaboration of authors

Personal reward is desirable type of stimulation, mostly for all management works and as a rule is accomplished on the form of premium. Premium is paid for personal a success, that is for achieved results of the person's activity for certain period per time, which are really seen: for outstanding novelty, creative idea, better patent, certificate, or any other document of the same nature. It reflects not only real result of a manager (resulting works), but also achievement of the stated goal (creative and innovation works), and also conformity of person to the function, which he plays in a group (functional works). Premium rate is established differentially, and can be of one-time or prolonged character of action, it means it can be additional payment to the main income

on the period established by administration. In case of necessity it is necessary to periodically revive formula for the reward calculation, it means preservation of principle of flexibility of motivation policy.

However, personal reward may be of non-material character. Because of this the proposed classification must be supplemented by the characteristics of hierarchical level of manager. Usually for the managers of lower level material stimulation is more important than non-material one. Middle-level managers perceive material and non-material stimulus, but prefer the material ones. For the top level managers non-material incentives are more important as they emphasize not only the importance of their work, but even more the weight of their status in organization, that is role of personality. Such flexible motivation policy, where principles of differentiation and efficiency are realized, will be fair and effective.

Collective reward can be a result of successful activity of certain structural department or it is appointed for conduction of the collective project. Stimulation of effective cooperation between departments, especially when they fulfil important project or take part in solving integrated problem also have collective nature. Because of this it is advisable to form optimal system of indicators and criteria of efficiency of work motivation methods, taking into account different methods of individual and collective working conduct. The indicator of economic efficiency of management work motivation is achievement of the economical goals by the enterprise, which ensure its high competitiveness owing to the innovative work nature. The indicator of the social efficiency of management motivation may be improvement in application and development of intellectual assets, increasing of the managers' professional competence, decrease in the level of conflict situations, improvement of the creative atmosphere etc.

Creativity as a potential source of novelty ensures economic growth, as in course of time generation of new ideas transforms into the innovations, which increase competitiveness of enterprise. However, creativity is a special state of a person, which must be supported naturally on the basis of creating atmosphere, favorable for the development of talents. Innovation culture is a method of collective motivation and that very factor which promote creation of a special creative environment within an enterprise. This, in particular, can be reached by changing the schedule of managers' work, transition from traditional normative working schedule to the work in the frames of "creative laboratory", which makes it possible to eliminate daily routine, while focusing on the creative work and production of new ideas. Besides, such creative atmosphere in organization departments encourages management to increase its professional level and gives satisfaction from the work. Satisfaction is a complex factor, which reflects not only the conditions and nature of work, but also is determined by relations in the collective, creative atmosphere, what is the result of strong corporative culture. It is understandable that it is hard for the management of enterprise constantly be in the state of creative search, and the very creativity depends on inspiration of every single employee, and in everyday work, filled out by formalized rules and regulations. However, such inspiration comes very seldom. Innovation culture can help in such situation, as in its essence there is constant search of the ideal (cult), which the enterprise seeks. It means that not just a search is needed, but constant stay in state of creativity, which allows achieving this ideal.

In the structure of innovation culture we distinguish culture of state, as the most life-giving innovation force and culture of action, as the most realizable force in terms of commercialization of innovation ideas. In their management activity the managers should use the elements of cultural states as an instrument of creativity stimulation. Culture of states is based on the natural laws, which stimulate creativity, in particular, law of creativity, the main thesis of which affirms that quality and singularity of new idea on input directly depends on these very factors on output, that is the force of motivation lever, capable of inspiring a person and help in the development of creative process. In other words we are talking about natural striving of a person for new impressions and feeling of "freshness", which gives birth to new ideas. Owing to well-thought organization of factors and incentives for development of creativity it is possible to maintain a constant feeling of novelty. In the present conditions stimulation effect of innovation culture influences constant generation of modern ideas and lays the foundation for establishment of creative system on the enterprise.

Creative system of an enterprise foresees not only constant production of new ideas, but leads to their logical completion, which is commercialization and diffusion of innovations.

According our previous research the main principles of creative system existence is based on several issues. In [6, c.84] one can find the specific rules and principles of creative system: *Important principles of existence of creative system on the enterprise is principle of reality, energetic and brevity, which are result of culture of actions. Thus, logically, instead of culture of state there comes culture of action, capable, due to its nature and principles, of speeding up the innovation development of enterprise.*

Functions carried out by culture of actions: motivational, integrating, creative, selective, regulatory, optimizing, communicative. Instrument of action – targets, and motive is convictions, rules, norms of conduct, contacts, thinking.

A state leads to a certain action, an action leads to the result, and thus by the intercession constant lifestyle circulation takes place. Transition from certain state to the result happens owing to the action or inducement to action. The result useful for society is reached thanks to social values, what is an element of culture.

7.5. CONCLUSIONS

In a sense of modern tendencies the role of culturological approach is uncovering the essence of many economic phenomena and further changing of reality in the context of the universal law of development, which in the level of enterprise is transformed into the innovation development.

Innovation development of enterprises in the conditions of tough competitiveness is possible owing to the creative searching, innovation culture which stimulates the development of creative system. Creative system which is the projection of innovation culture is a key factor of success, and its heart is a personnel of enterprise and team of managers, united by common values, interests and desire to fulfil the mission of their enterprise.

Identical sides of motivation and innovation culture are expressed in the principle of development, structure (values as a basis of innovation culture) and functions.

Owing to the motivational function of innovation culture which characterizes the system of principles and standards, which regulate the working activity of personnel, the basis of which are common values, the enterprises will be able to maintain positive dynamics of managers' creative development.

Innovation culture embraces all chain of relations, which are established from the moment of initiation of the idea to its realization, thus the motivation field expands and embraces motivation to the production of new ideas, motivation of the idea commercialization and motivation of the expansion of new ideas. Thus we can affirm that motivation function has integration nature and wide range of action.

Further researches should be conducted in the context of enrichment of this problem by applied aspects, in particular, construction of the model, which makes it possible to estimate efficiency of influence of innovation culture on the motivation of management creativity and development of creative management in general.

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8

FORECASTING OF CORRELATED TIME SERIES ON THE EXAMPLE OF INDUSTRY OF L'VIV REGION

The paper considers the simultaneous forecasting related time series. The feature of such predictions is a necessity to take into account the common trends inherent throughout the dataset. For this purpose it is suggested to use the method of dynamic factor analysis, such as ARMA. To simulate the dynamics of time series models. The calculated model is dedicated to indexes of industrial development in the L'viv area.

8.1. INTRODUCTION

The purpose of this study is to develop and analyze models suitable for simultaneous forecasting industry indexes of the L'viv region by industry type. It focuses on the fact that these series are correlated and while predicting the entire set of difficulties arise. What is more, the study considers predicting the total set of indicators having the level of difficulty associated with the forecasting analysis of confidence intervals. In particular, it is difficult to measure the upper (or lower) interval estimation of prognosis of one index especially because it may be accompanied by upper (or lower) confidence limits for other indexes. This factor should appeal to further analysis.

8.2. ANALYSIS OF RECENT RESEARCH

Application of the latter to study time series has a long history and even distinguish a dynamic factor analysis (DFA). A considerable contribution to development of this method belongs to such scientists as Coppi [5], Molenaar [5, 17] and others.

Covariance structure modelling as a statistical method for testing models of relationships is known from years [1]. Covariance structure modelling was commonly used [7, 5] and others in different areas, such as psychology and medicine. Micro-

analytic studies of such patterns was emphasized in such braches as social interaction [9], psychopathology [14], psychology [34, 25, 30], biological psychology [4], decision processes [10].

There is also excessive literature on adapting such models as ARMA models [23] Bayesian analysis and MCMC simulation techniques [6] or Correlation Engine [29].

The literature can find on periodically correlated processes [35, 22, 28] and time series [17, 26, 27, 3, 32, 8, 31, 33, 33, 34].

8.3.   L'VIV REGION INDUSTRY FORECASTING

Static factor model assumes that a set of correlated indicators can be explained with the action of some hidden, independent and uncorrelated factors. The dynamic factor analysis is complicated [18]. It assumes that the model can be expanded to lag common factors [21]. With this assumption it is possible to calculate factors for time series and make predictions based on them [2].

In general, the dynamic factor model can be written as follows:

$$Y_t = A(L)F_t + U_t, \ t = 1,...n \tag{8.1}$$

where A(L) – lagged matrix of factor loadings;

$Y_t = [y_{1t}, y_{2t}, ..., y_{mt}]$ – vector of dependent variables at moment t;

$F_t = [f_{1t}, f_{2t}, ..., f_{rt}]$ –vector of unobservable factors at moment t;

$U_t = [u_{1t}, u_{2t}, ..., u_{mt}]$ – vector of idiosyncratic errors in period t,.

Thus we have a distributed lag model. Component factors are usually described by the models:

$$F_t = B_1 F_{t-1} + B_2 F_{t-2} + ... + B_3 F_{t-k} + V_t \tag{8.2}$$

where Bj - vector of parameters for factors with lag j;

$V_t = [v_{1t}, v_{2t}, ..., v_{mt}]$ – vector of disturbances.

In other words, the factor can be described with the process of autoregression of order k.

We suggest to decompose forecasting into the following stages [12,13]:
- development of dynamic factor model;
- calculation of general factors values and idiosyncratic errors;
- forecasting of common factors;
- discovering the models for idiosyncratic errors and forecasting.

Dynamic factors and disturbances, as was shown by Molenaar [4] and Penna (2004), are naturally described by the ARMA model. The extension of this model is ARMAX model, which is of minor significance in external variables [11]. In our research we focused on overall impact of external factors that led to changes in trends

during the crisis in 2008. This effect is easy to explain using a model with interventions (outliers). AR process is also a partial case of ARMA and it is often transformed form AR to ARMA to reduce the number of parameters in the model. Therefore ARMA model for factors can be written in the form:

$$\phi(L)f_t = \theta(L)a_t$$

(8.3)

y_t – the predicted variable is reduced to a stationary type;

$\theta(L)$ – parameters of moving average for white noise errors;

$\phi(L)$ – parameters of autoregression process;

a_t – white noise errors uncorrelated with ut.

Model for residual (ut) forecasting looks like

$$u_t = \frac{\theta(L)}{\phi(L)}e_t + \frac{\omega(L)}{\delta(L)}S_t^T$$

(8.4)

$\omega(L)$ and $\delta(L)$ – lagged parameters of transfer function for interruptions;

S_t – step variable, which reflects the long-term effect of external factors (intervention):

$$S_t = \begin{cases} 0, & for\ t < T \\ 1, & for\ t \geq T \end{cases}$$

(8.5)

T - the start of the intervention.

e_t – white noise errors.

ARMAX models are more general cases of ARMA. In the analysis, along with ARMAX we have also to estimate models without outliers.

In this paper we will not focus on DFA evaluation methods and ARMA models, because they are described in the original scientific papers.

8.4. OBTAINED RESULTS

Data used in the study were collected monthly in the period between January 2001 and July 2012. In total, 8 time series including 140 observations were analyzed in the case study. These time series represent industry indexes in the L'viv region by types of industry [20].

All time series have strong seasonality. So before evaluation the model, each series was seasonally adjusted. Moreover, in all time series fluctuations tend to increase that's why seasonality must be described by multiplicative seasonal factors

As in Adam Jędrzejczyk's study [1] we used the ARIMA-X12 method. This method is widely used and maintained by the U.S. Census Bureau. All time series have the order of integration equal to one, so instead of the original values we considered their first differences.

These derivative series with correlations are described in the table 8.1.

Table 8.1 Correlation matrix of differences of industrial production indices by type of industry

	1	2	3	4	5	6	7	8
1	1,00	*0,28*	0,09	*0,23*	*0,39*	0,12	0,16	-0,00
2	*0,28*	1,00	-0,00	*0,23*	0,14	-0,10	*0,21*	0,09
3	0,09	-0,00	1,00	0,15	*0,25*	*0,31*	0,09	0,08
4	*0,23*	*0,23*	0,15	1,00	*0,21*	*0,19*	*0,22*	0,13
5	*0,39*	0,14	*0,25*	0,21	1,00	*0,29*	*0,18*	*0,19*
6	0,12	-0,10	*0,31*	0,19	0,29	1,00	-0,01	*0,19*
7	0,16	*0,21*	0,09	*0,22*	*0,18*	-0,01	1,00	0,08
8	-0,00	0,09	0,08	0,13	*0,19*	*0,19*	0,08	1,00

Where:
1 – Food, beverages and tobacco;
2 – Light industry;
3 – Wood processing and production of wood products, except furniture;
4 – Pulp and paper industry, publishing;
5 – Chemical and petrochemical industry;
6 – Manufacture of other non-metallic mineral products;
7 – Metallurgy and manufacture of fabricated metal products;
8 – Engineering.

Table 8.1 presents that even after eliminating trend and seasonality from indicators significant correlations are still present (for significance level 0.05). For this significance level minimal significant correlation coefficient for 139 observations is 0,17.

Bartlett's Test of Sphericity for these time series is equal to 148,3 with significance level less than 0,01. Kaiser-Meyer-Olkin Measure of Sampling Adequacy is equal to 0,59, what indicates that the series are acceptable for factor analysis.

As a result of evaluation of dynamic factor model the meaningful factor loading were got only for one factor. This factor is described by AR(1) process of the form in eq. 8.6.

$$f_t = -0,489_1 \cdot f_{t-1}$$
(8.6)

Therefore the model can be named the model of dynamic factors.

Received factors explain almost 15% of the total variation of the set of all variables. Factor loading for dynamic factor model are given in the table 8.2.

Table 8.2 Factor loadings for the common factor of the dynamic factor model of industry indexes of the L'viv region

Types of industrial activity	Factor loadings, (a_i)	OIM Standart Error	z	P>|z|	95% confidence interval	
Food, beverages and tobacco	3,3313	0,6014	5,54	0	2,1525	4,5100
Light industry	2,4792	0,8180	3,03	0,002	0,8759	4,0825
Wood processing and production of wood products, except furniture	2,4656	0,9301	2,65	0,008	0,6426	4,2887
Pulp and paper industry, publishing	1,6325	0,4096	3,99	0	0,8297	2,4354
Chemical and petrochemical industry	3,6850	0,6211	5,93	0	2,4678	4,9023
Manufacture of other non-metallic mineral products	2,7768	0,9038	3,07	0,002	1,0053	4,5482
Metallurgy and manufacture of fabricated metal products	2,9045	0,9846	2,95	0,003	0,9748	4,8342
Engineering	1,605	0,698	2,30	0,021	0,2368	2,9734

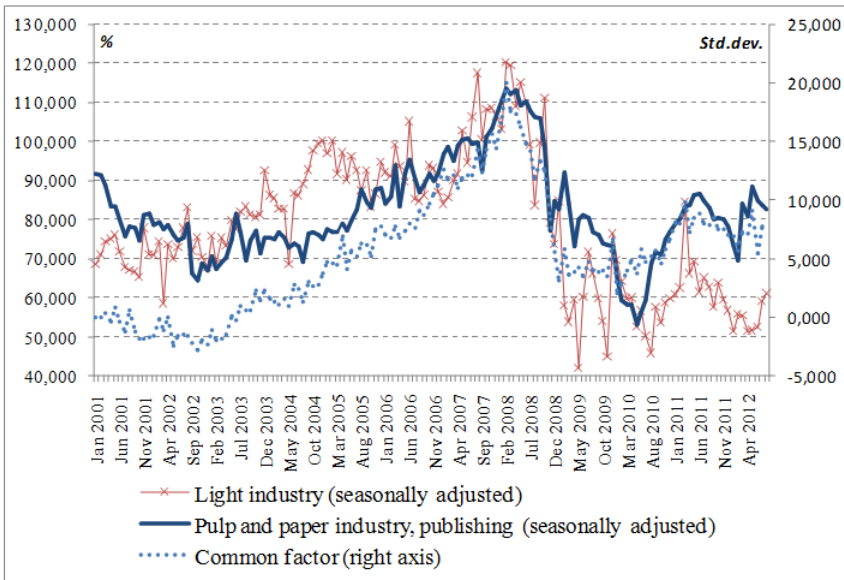The calculated common factor in the integrated state can be seen in Figures 8.2-8.3.

Fig. 8.1. Comparison of the dynamics of the common factor with the dynamics of indices of industrial production of light industry and pulp and paper industry
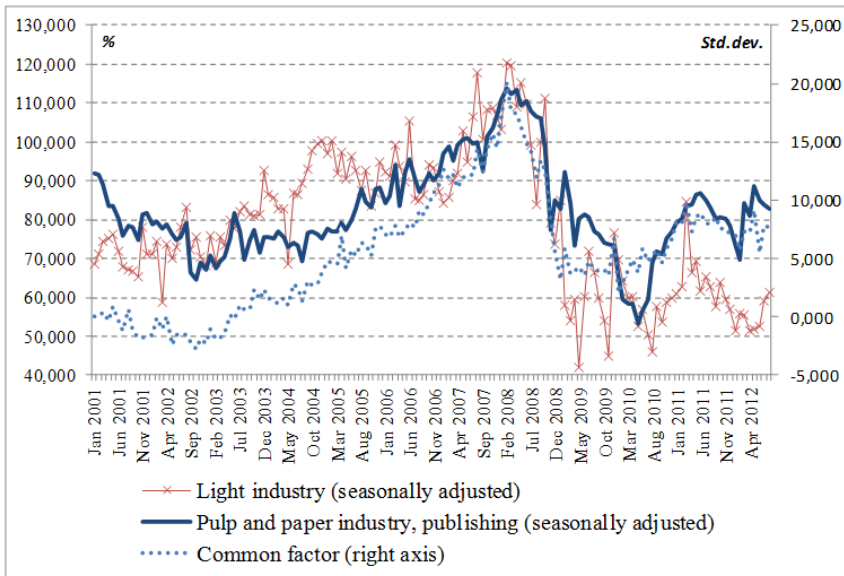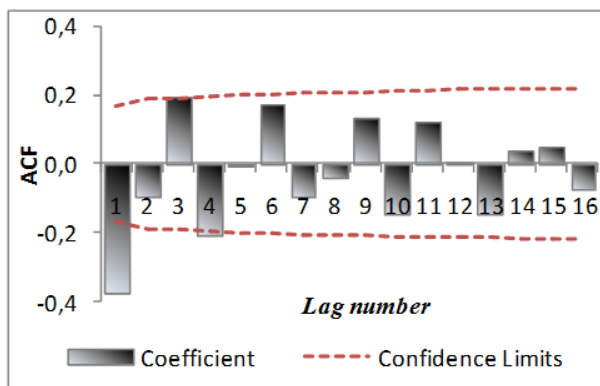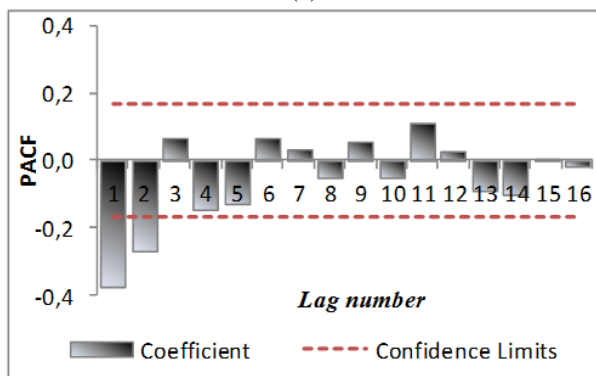*Source: own work*

Fig. 8.2. Comparison of common factor dynamics with dynamics of the indices of food, beverages and tobacco, metallurgy and manufacture of fabricated metal products
Source: own work

Figures presents the compare of the dynamics of industry indices with the common factor. All indices are seasonally adjusted. We can see that the factor basically repeats the trends inherent in all given time series. Especially similar is the behavior of pulp and paper industry and metallurgy and manufacture of fabricated metal products. Somewhat worse is explained the level shift in the food industry, but fluctuations described by autocorrelation with lag one in this series are described pretty good.

As already mentioned, model of the residuals is naturally described by ARMA processes, so to identify them first building autocorrelation function. So for the indices of the food industry, they will form (Figure 8.3).

(a)

(b)

Fig. 8.3. Autocorrelation functions for common factor: (a) – autocorrelation function; (b) – partial autocorrelation function
Source: own work

Figure presents the rapidly decrease to zero of autocorrelation coefficients. That is the evidence of the lack of trend in the time series. Test statistic of Dickey-Fuller test for

unit root equals -12,7 the critical values are -4,03 and -3.4 for the significance level of .01 and .05, respectively. So null hypothesis is rejected, and it is concluded that the series does not have trend.

The shape of autocorrelation functions gives a reason to identify the factor model of the following processes as ARMA (2,0). Among all possible models this model has the best autocorrelation and partial autocorrelation functions of the residuals.

In November 2008 we identified additive outlier (AO), caused by the crisis. The estimates of model parameters are presented in Table 8.3.

Table 8.3 Estimates of ARMAX (2,0) parameters for idiosyncratic errors of industry index of food, beverages and tobacco

Parameter		Estimate	Standard error	t	Sig.	Estimate
Process	Denote					
AR	$\phi 1$	-0,505	0,083	-6,1	0,000	-0,505
	$\phi 2$	-0,3	0,083	-3,612	0,000	-0,3
Additive outlier in November 2008		-12,921	4,773	-2,707	0,008	-12,921
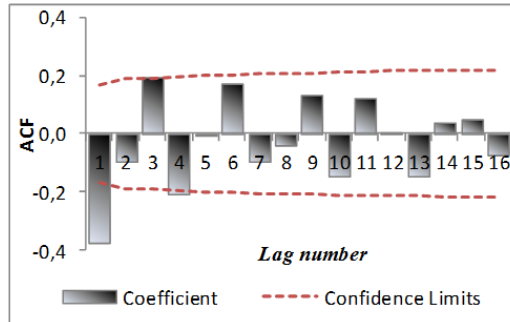
(a)
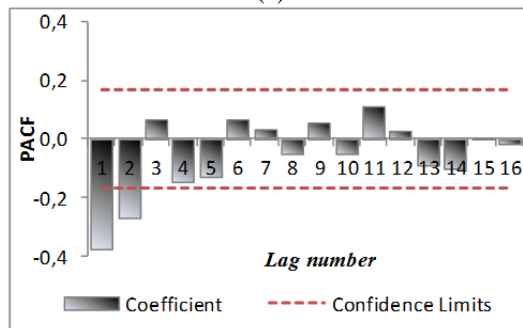
(b)

Fig. 8.4. Autocorrelation functions of ARMAX(2,0) residuals for industry index of food, beverages and tobacco: (a) − autocorrelation function (b) − partial autocorrelation function
Source: own work

The figure presents that with the exception of lag 4 autocorrelation functions of all the values are not statistically significant. The Ljung-Box Q-test for residual autocorrelation for lag 16 is 14.3, which corresponds to the level of significance of 0.58. For all lags significance level of this test is lower than 0.16. The chi-square test for normality of the residuals confirms their randomness. The calculated value of chi-square test is approximately 8.8 whereas tabular value for significance level 0.05 and degrees of freedom 5 is equal to 11,07 (see figure 8.3).

The chi-square test for normality of the residuals confirms their randomness. The calculated value of chi-square test is approximately 12,9 whereas tabular value for significance level 0,05 and degrees of freedom 8 is equal to 15,5. Therefore, this model can be considered acceptable. Idiosyncratic error for light industry is described with autocorrelation functions (figure 8.5).
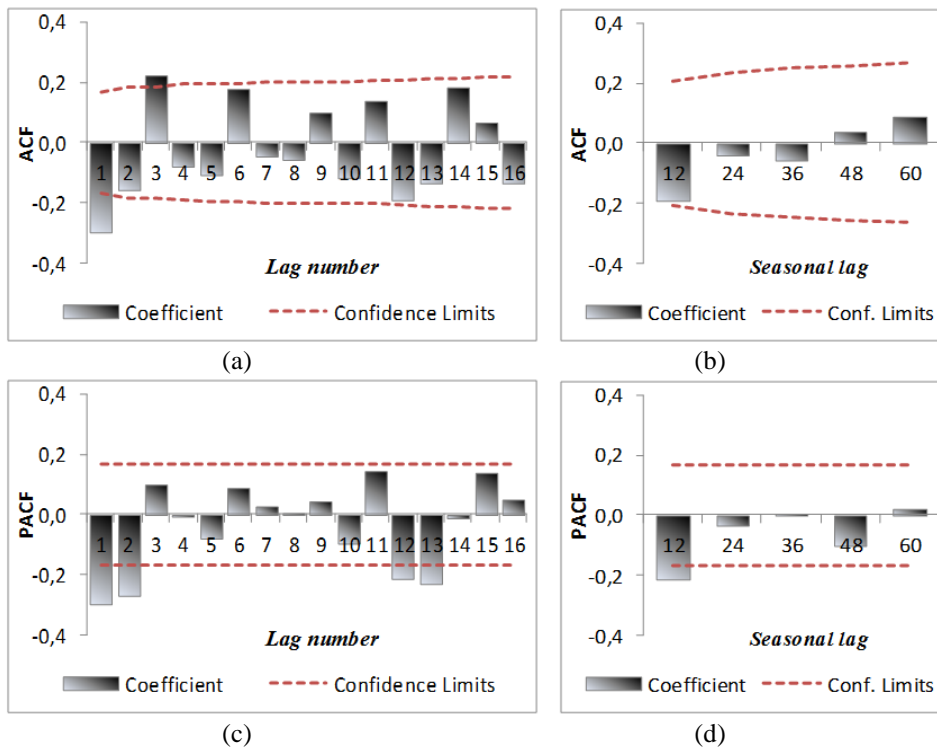

Fig. 8.5. Autocorrelation functions of common factor (a), (b) – autocorrelation function; (c) (d) – partial autocorrelation function

Significant autocorrelation coefficients for lag one of the autocorrelation function and lags 1,2 and 12 of the partial autocorrelation functions indicate that the most likely model for the time series should describe AR (2) or MA (1) processes and SAR (1) or SMA (1) processes in seasonality. The best residual autocorrelation function of all

possible models give ARMA model (2,0) (0,1). The model should also contain additive intervention in Nov. 2008. Estimates of the model parameters are given in Table 8.4.

Table 8.4 Estimates of ARMA (2,0)(0,1) parameters for idiosyncratic errors of light industry index

Parameter		Estimate	Standard error	t	Sig.
Process	Denote				
AR	$\phi1$	-0,427	0,084	-5,099	0,000
	$\phi2$	-0,267	0,086	-3,101	0,002
SMA	$\Theta12$	0,327	0,087	3,768	0,000
Additive outlier in Nov. 2008		-25,180	6,422	-3,921	0,000

Autocorrelation function of the model residuals indicate no unexplained relations for all lags (see Figure 8.6).
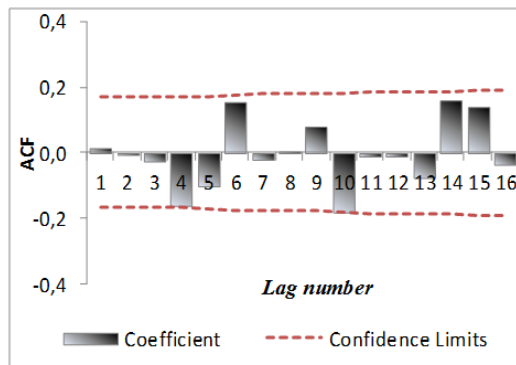
(a)
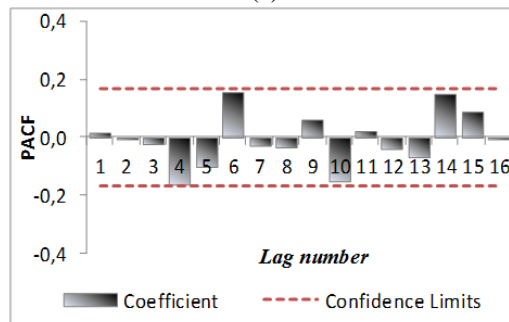
(b)

Fig. 8.6. Autocorrelation functions of the residuals of ARMAX(2,0)(0,1) for industry index of food, beverages and tobacco: (a) – autocorrelation function; (b) – partial autocorrelation function
Source: own work

The residuals, also are distributed normally. This is evidenced by the chi-square test. Its estimate is approximately equal 1,75 while the theoretical value for the significance level 0,05 is 7,8.

Models for other industries were evaluated similarly. The results of these calculations are presented in Table 8.5.

Table 8.5 Estimates of ARMA (2,0)(0,1) parameters for idiosyncratic errors of light industry index

Types of industrial activity	Parameter		Estimate	Standard error	t	Sig.
	Process	Denote				
Food, beverages and tobacco	AR	ф1	-0,505	0,083	-6,1	0,000
		ф2	-0,3	0,083	-3,612	0,000
	Additive outlier in November 2008		-12,921	4,773	-2,707	0,008
Light industry	AR	ф1	-0,427	0,084	-5,099	0,000
		ф2	-0,267	0,086	-3,101	0,002
	SMA	Θ_{12}	0,327	0,087	3,768	0,000
	Additive outlier in November 2008		-25,180	6,422	-3,921	0,000
Wood processing and production of wood products, except furniture	MA	θ_1	0,294	0,084	3,483	0,001
		θ_2	0,226	0,084	2,678	0,008
	Additive outlier in November 2008		-31,624	8,412	-3,759	0,000
Pulp and paper industry, publishing	SMA	Θ_{12}	0,243	0,092	2,649	0,009
	Additive outlier in November 2008		-20,620	3,963	-5,203	0,000
Chemical and petrochemical industry	AR	ϕ_1	-0,155	0,084	-1,849	0,067
Manufacture of other non-metallic mineral products	SMA	Θ_{12}	-0,192	0,089	-2,162	0,032
Metallurgy and manufacture of fabricated metal products	MA	θ_1	0,453	0,077	5,899	0,000
	Additive outlier in November 2008		-38,318	8,315	-4,608	0,000
Engineering	AR	ϕ_1	-0,257	0,082	-3,125	0,002

Thus, to predict the index of industrial production we make prediction of idiosyncratic errors, then add optimistic, pessimistic or mean estimates of forecast of the common factor. Also remember the fact that we did differencing of input series for lags 1 and removed seasonality. Thus the forecast must be integrated and then added seasonality. Optimistic scenario is one that corresponds to the upper limit of confidence interval for the factor forecast. Pessimistic corresponds to the lower limit of confidence

interval. Mean scenario represents the mean prognosis of the factor. Interval estimation model factor can be found from the model ARMA (1,0).

As an example of forecasting, consider the time series of food, beverages and tobacco industry.

Figures 8.4-8.6 present the prediction of industrial production index of food, beverages and tobacco for three scenario of common trend forecasts.

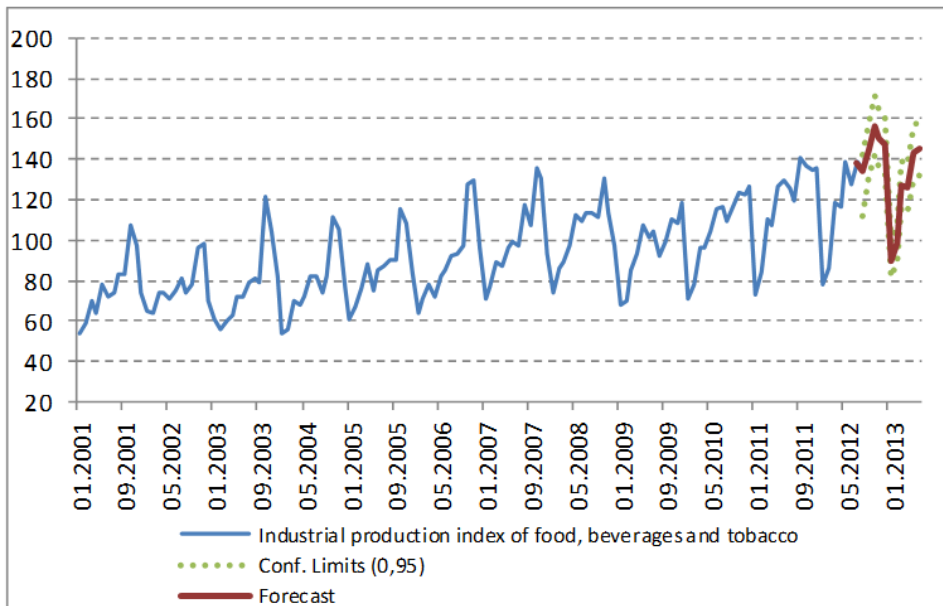Fig. 8.7. Forecast of the index of food, beverages and tobacco industry for mean scenario of common factorforecast
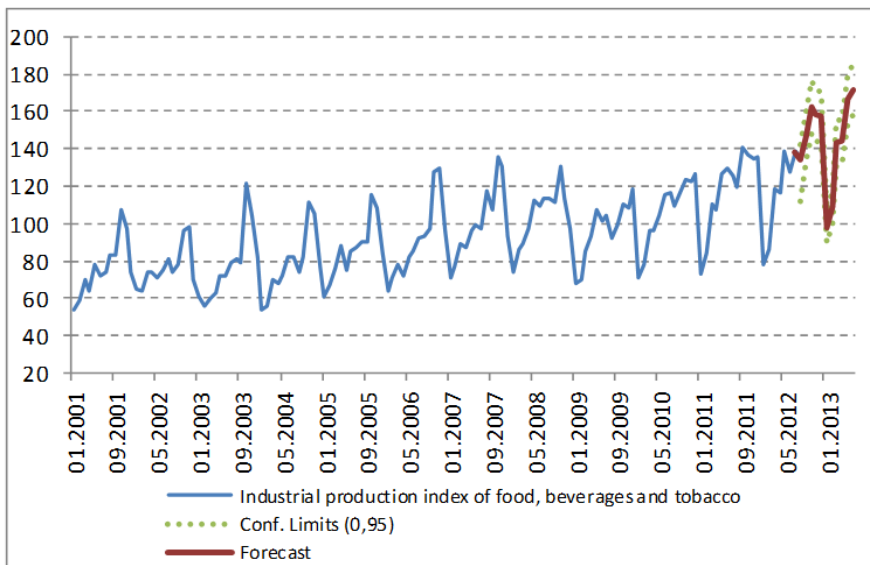*Source: own work*

Fig. 8.8. Forecast of the index of food, beverages and tobacco industry for optimistic scenario of
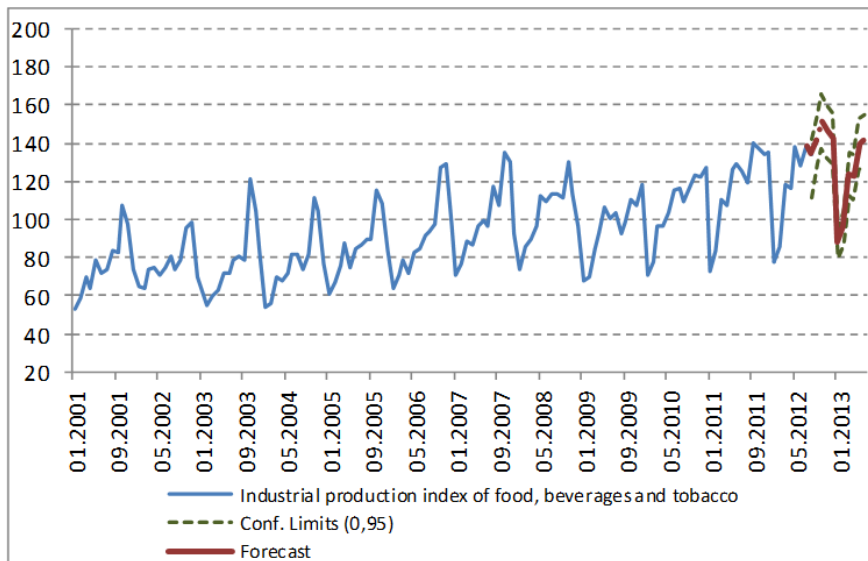common factor forecast
Source: own work

Fig. 8.9. Forecast of the index of food, beverages and tobacco industry for pessimistic scenario of
common factor forecast
Source: own work

Table 8.6 Forecast of the index of food, beverages and tobacco industry in L'viv region

Date	Mean scenario			Pessimistic scenario			Optimistic scenario		
	Forecast	Confidence Limits (0,95)		Forecast	Confidence Limits (0,95)		Forecast	Confidence Limits (0,95)	
		Lower	Upper		Lower	Upper		Lower	Upper
Sep 2012	144,34	131,16	157,52	142,07	128,89	155,24	146,62	133,44	159,80
Oct 2012	156,75	142,48	171,01	151,95	137,68	166,21	161,99	147,73	176,26
Nov 2012	150,07	136,21	163,94	146,56	132,70	160,43	157,86	144,00	171,72
Dec 2012	146,83	133,22	160,45	142,87	129,25	156,48	157,18	143,56	170,79
Jan 2013	90,00	81,67	98,32	87,73	79,40	96,05	97,98	89,66	106,31
Feb 2013	98,22	89,12	107,32	95,66	86,56	104,76	108,77	99,67	117,86
Mar 2013	127,17	115,39	138,95	123,90	112,12	135,68	143,18	131,40	154,96
Apr 2013	125,69	114,05	137,33	122,44	110,80	134,08	143,83	132,19	155,47
May 2013	143,16	129,90	156,42	139,48	126,22	152,74	166,49	153,23	179,75
Jun 2013	145,52	132,05	159,00	141,77	128,29	155,25	171,93	158,45	185,41
Jul 2013	145,27	131,81	158,72	141,52	128,07	154,97	174,31	160,86	187,77
Aug 2013	136,42	123,79	149,06	132,90	120,27	145,54	166,23	153,59	178,86

So, for the average scenario in August 2013 according to this forecast can be expected that the index of production of food, beverages and tobacco products will increase by 1,5% compared to August 2012. In general, comparing the entire forecast period with the same previous period of time it is expected to increase by approximately 8,3%. If a common trend to develops a pessimistic scenario, the level of this index in August will reach an average 132.9% from 2007, which compared to the previous same time period corresponds to a reduction of 5%. For the optimistic scenario we can expect growth by 166,23% at the end of the forecast horizon and comparing with the same previous period it equals 120,9% compared to August 2011 – July 2013

The forecast for light industry index is shown in Figures 8.7-8.9.
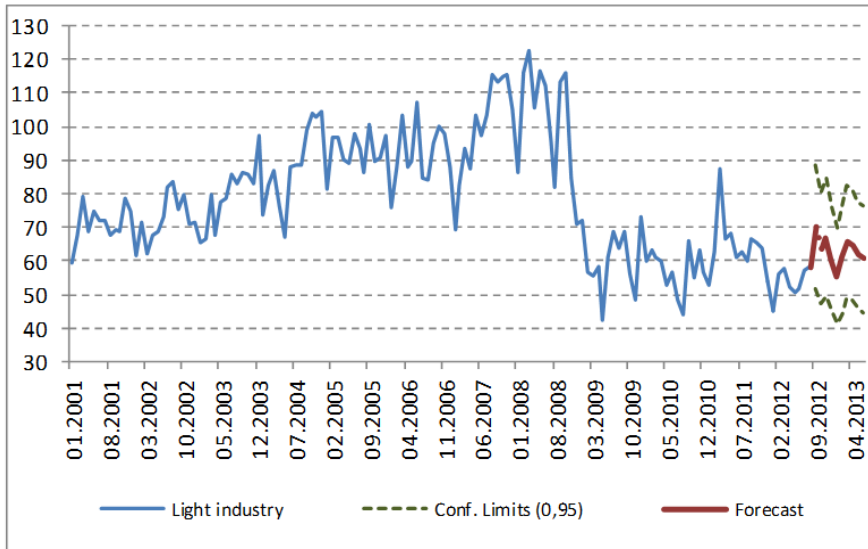
Fig. 8.10. Forecast of light industry index for mean scenario of common factor forecast
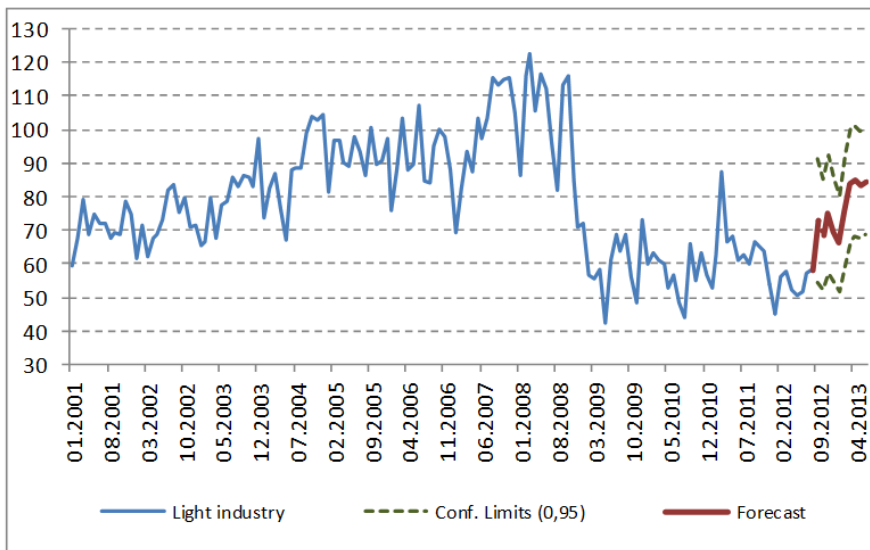*Source: own work*

Fig. 8.11. Forecast of light industry index for optimistic scenario of common factor forecast
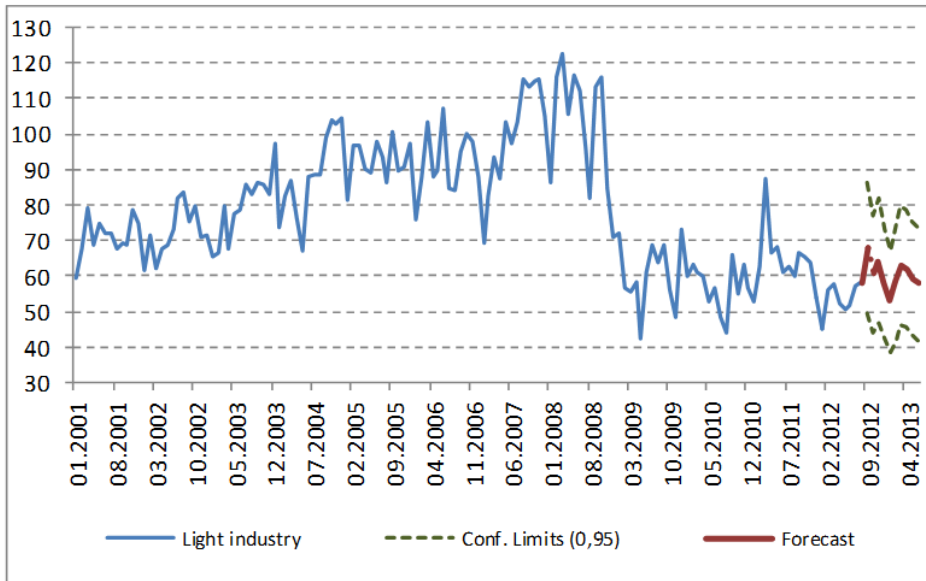*Source: own work*

Fig. 8.12. Forecast of light industry index for pessimistic scenario of common factor forecast
Source: own work

Table 8.7 Forecast of the index of light industry in L'viv region

Date	Mean scenario			Pessimistic scenario			Optimistic scenario		
	Forecast	Confidence Limits (0,95)		Forecast	Confidence Limits (0,95)		Forecast	Confidence Limits (0,95)	
		Lower	Upper		Lower	Upper		Lower	Upper
Sep 2012	69,98	51,54	88,44	68,07	49,62	86,53	72,93	54,49	91,39
Oct 2012	63,73	47,33	80,14	60,51	44,11	76,92	68,55	52,15	84,96
Nov 2012	66,90	49,38	84,41	64,29	46,77	81,80	74,77	57,25	92,28
Dec 2012	60,40	44,95	75,85	57,76	42,31	73,21	69,64	54,19	85,09
Jan 2013	55,30	40,97	69,63	53,00	38,67	67,33	66,07	51,75	80,40
Feb 2013	61,04	44,69	77,39	58,33	41,98	74,68	75,82	59,47	92,17
Mar 2013	65,77	48,93	82,63	63,03	46,18	79,88	83,58	66,73	100,43
Apr 2013	64,77	48,27	81,27	62,06	45,56	78,56	84,72	68,23	101,22
May 2013	61,84	45,98	77,70	59,24	43,38	75,10	83,44	67,58	99,30
Jun 2013	60,48	44,62	76,34	57,88	42,02	73,74	84,50	68,64	100,36
Jul 2013	59,06	43,35	74,78	56,48	40,78	72,20	85,26	69,55	100,97
Aug 2013	58,93	42,77	75,09	56,40	40,23	72,55	87,12	70,96	103,28

As can be seen from the graph the total forecast error isn't quite high, however, this method reduces the uncertainty of knowing the general trends in the economy.

8.5. CONCLUSIONS

Simultaneous forecasting related time series is a problem commonly discussed in the literature. The paper presents the method considering ARMA model. Eight time series regarding industrial development in the L'viv area were analysed. The presented model was used to successfully analyse all presented time series.

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9

CONTRACTUAL REGULATION OF RISKS IN SOCIAL AND LABOUR RELATIONS

The author itemizes the conceptual basics of contractual regulation of risks in social and labour relations. This paper presents an overview of domestic and foreign experience in the field of the contractual regulation of risks in social and labour relations. It introduces some emerging issues with respect to current regulation in Ukraine. The paper also deals with social partner organisations and the criteria of their representativeness.

9.1.   INTRODUCTION

Contractual regulation is a key issue of the risk management in social and labour relations (SLR). The experience of many countries proves that successful development of economics, entrepreneurship and employee's personality is possible only in case of the intension to balance workers and employers interests and needs. Collective bargaining is the best way to figure out the respective interests and needs of the parties and agree on mutually acceptable solutions. The result of the given negotiation is a collective bargaining agreement (CBA) or a collective employment agreement (CEA).

The aim of this study is to identify conceptual basics and emerging issues of contractual regulation of risks in social and labour relations.

9.2.   ANALYSIS OF RECENT RESEARCH

A great number of well-known domestic scientists focus in their research works on some aspects of contractual regulation of risks in social and labour relations. Those, in particular, are E. Libanova, A. Kolot, O. Hrishnova, V. Zhukov. However, they do not pay enough attention to many practical issues and weaknesses in the regulation of risks

in social and labour relations. Incidentally, they do not give enough consideration to social partner organisations and the criteria of their representativeness which are especially important in Ukraine where trade-union activity is inefficient.

9.3.   RESEARCH RESULTS

The dynamics and multiplicity of factors that form and indicate risks in social and labour relations stipulate the need to regulate them. The majority of domestic and foreign scientists prefer to use systematic approach while investigating the regulatory methods applied to control those risks as an element of social and labour relations' system [7, 1, 3, 6, 2, 9]. They view them as a total which functions as a system and includes various managerial tools.

Opportunities of risks' regulation in SLR have their specifics depending on the management techniques used within social and labour relationships. The classification of regulatory methods applied to control the risks in SLR is demonstrated in Figure 9.1 (see figure 9.1 – elaborated according to [1, 2, 11]).
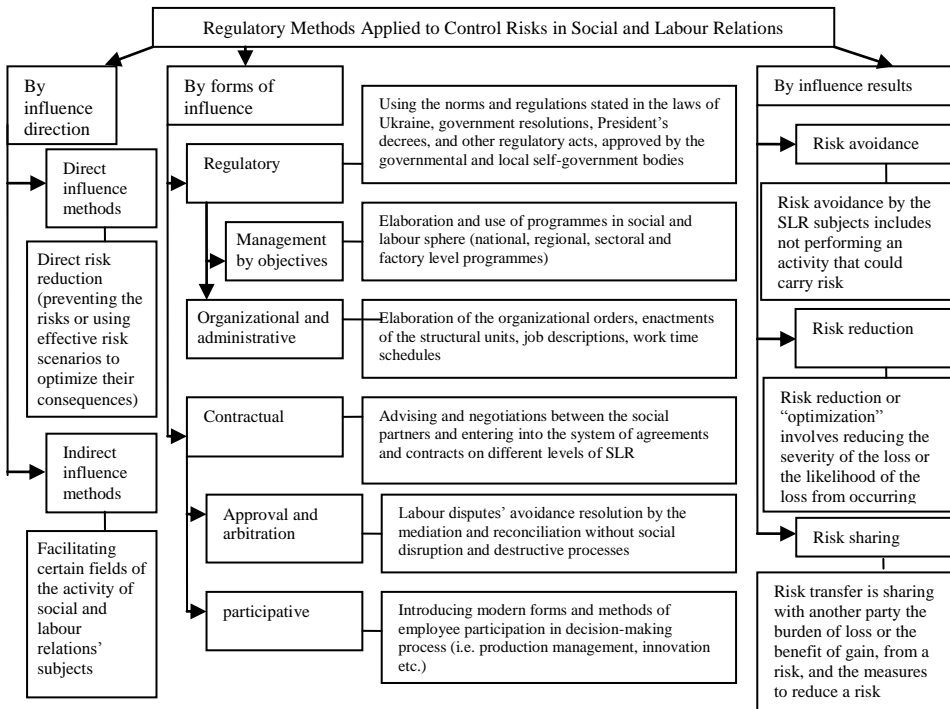
Rys. 9.1. Classification of Regulatory Methods Applied to Control Risks in Social and Labour Relations

Source: own work

Risks' regulation in SLR should be viewed as a system that consists of a set of measures which are designed to provide a balance of the interests of the social partners. This system also intends to prevent the occurrence of risks in social and labour relations and to optimize their impact (see figure 9.2 – elaborated by the author).
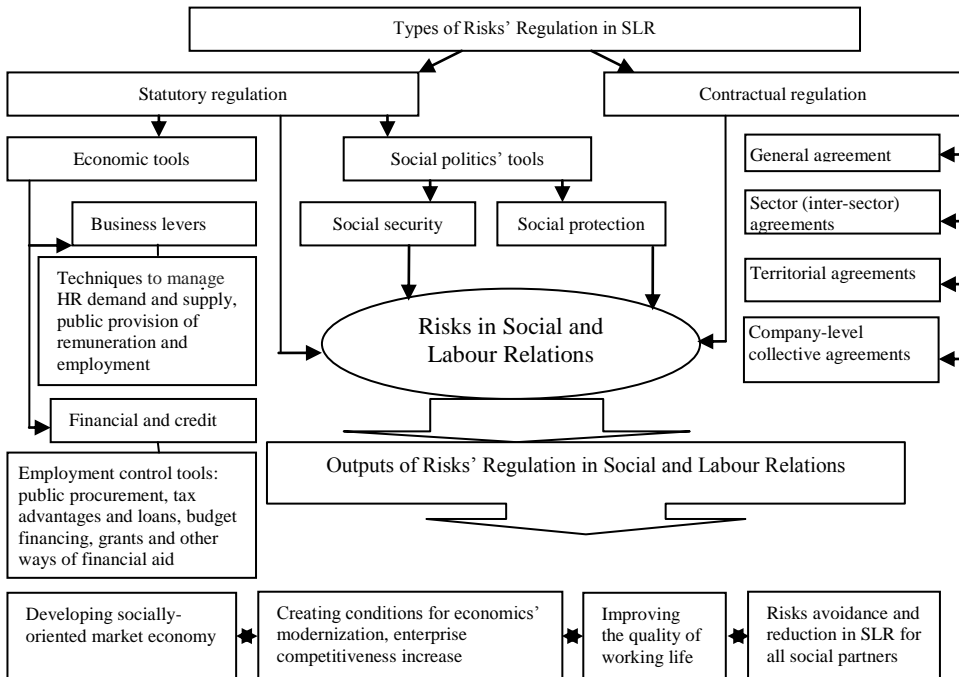
Rys. 9.2. System of Risks' Regulation in Social and Labour Relations
Source: own work

Normative regulation of risks in social and labour relations is well-known and proven. This particularly regards to the mandatory social insurance and basic social norms and standards. One can see gradual implementation of voluntary social insurance, including medical care. Thus, as for today contractual mechanism to prevent risks in SLR is the procedure which mostly needs consideration. That is why the further research will concentrate on this field.

One can agree with the foreign and domestic experts who believe that mutually agreed system remains the major institute of social and labour relations' regulation. This system, unlike the levers of state influence, is more flexible, mobile, and adaptive [13].

Contractual regulation represents a special system of relationships that arise between employees and employers with the mediation of the state which aims at the harmonization of economic interests in the social and employment field and social and labour dispute resolution.

The forms of social partnership gain determining significance in contractual regulation of risks in SLR, as it is the basis of the social partners' interaction (see figure 9.3 – compiled by the author).
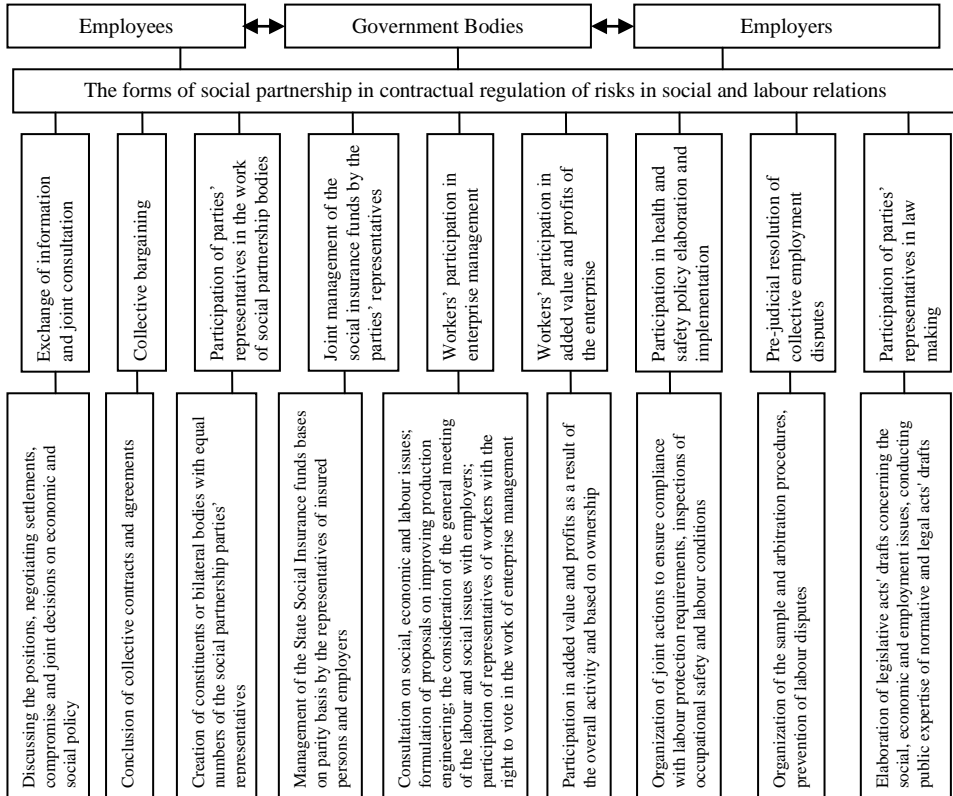
Fig. 9.3. The Forms of Social Partnership in Contractual Regulation of Risks in SLR
Source: own work

There are two main directions of international risks' regulation in SLR which are nowadays implemented in Ukraine. Those are settling contracts and collective agreements, as well as the use of collective labour dispute resolution procedures.

In accordance with the Law of Ukraine "On Collective Contracts and Agreements" the system of collective contractual regulation includes national, industry, regional and enterprise levels. Economy-wide (national) bargaining aims at providing a floor for lower-level bargaining on the terms of employment, often taking into account remuneration, income, population's level of life, social guarantees, social security and social insurance. Sectoral bargaining aims at the standardization of the terms of employment in one industry (industries), includes a range of bargaining patterns (i.e. social guarantees and benefits). Territorial agreements govern the standards of

employees' social security and basing on the conditions and economic potential of the respective territorial subunit they can set out higher wage scales, better social guarantees and benefits comparing to the national or branch agreements. Collective agreement regulates industrial, labour, social and economic relations and coordinates the interests of a group of employees, employers and their representative bodies.

The distribution of the functions between the social partners at various levels of contractual regulation is demonstrated in Figure 9.4 (see figure 9.4 – compiled by the author).
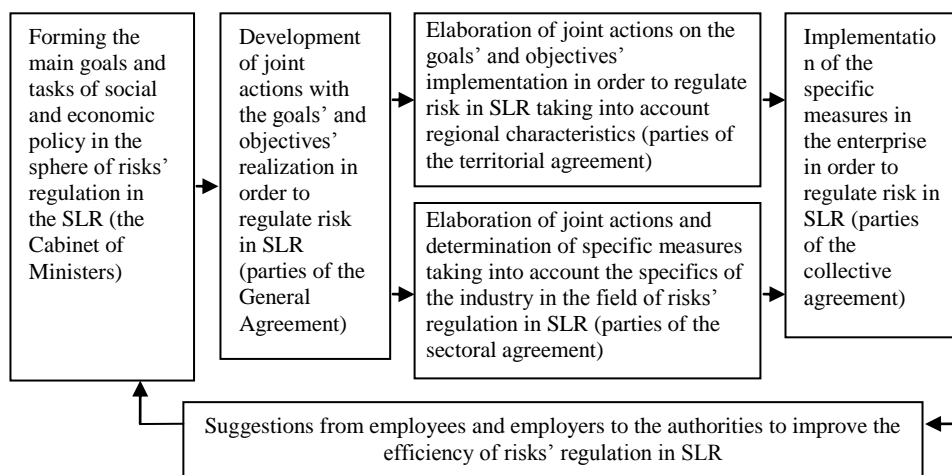
| Forming the main goals and tasks of social and economic policy in the sphere of risks' regulation in the SLR (the Cabinet of Ministers) | Development of joint actions with the goals' and objectives' realization in order to regulate risk in SLR (parties of the General Agreement) | Elaboration of joint actions on the goals' and objectives' implementation in order to regulate risk in SLR taking into account regional characteristics (parties of the territorial agreement)

Elaboration of joint actions and determination of specific measures taking into account the specifics of the industry in the field of risks' regulation in SLR (parties of the sectoral agreement) | Implementation of the specific measures in the enterprise in order to regulate risk in SLR (parties of the collective agreement) |

Suggestions from employees and employers to the authorities to improve the efficiency of risks' regulation in SLR

Fig. 9.4. Interaction of the Parties in the Process of Risks' Contractual Regulation in SLR
Source: own work

Within the transition from the first to the third level of agreements (from the national to the industry) the framework of the agreements stays the same. At the same time, one can note a shift from the general provisions to the specific activities and narrowing of the list of obligations of all three Parties. Contractual mechanism of risk regulation in SLR can be truly effective only in case (1) it is brought to the primary management unit – enterprises, and (2) social decisions directly depend on the effectiveness of the production activities of the enterprise, its competitiveness.

In order to analyze the effectiveness of the contractual risks' regulation in SLR in Ukraine there is a need to compare it with a similar system which operates in the economically developed countries.

Western scientific literature most often identifies and compares two models of collective contractual regulation: Anglo-American and Western European ones [5].

The distinguishing features of the Anglo-American model are as follows:
- a convergence in the area of labour rights toward private ordering (work and employment terms and conditions are primarily determined at the level of the individual organization);

- collective bargaining mostly emphasizes economic issues;
- the relations between the Contracting Parties can be characterised as confrontation;
- state interference is minimal.
  Western European model of collective contractual regulation includes:
- coordinated, centralized (within national, regional, and industry framework) collective agreements (contracts);
- negotiating not only for economic issues but for social justice;
- significant state interference;
- the domination of cooperative relations between the social partners.

Table 9.1 demonstrates the basic elements of the collective contractual regulation in social and labour relations in the countries with advanced economies (see table 1 – elaborated according to [10, 11]).

The degree of responsibility for the violation of the obligations provided in the collective agreement varies by country [14, pp. 19-22]. In the United States the legislation does not provide severe penalties for the violation or failure to comply with the collective agreements. However, in Italy the regulations which establish mandatory provisions as for working hours and labour safety determine the sanctions that are used against employers in case of failure to comply with these norms. Labour inspectors have the right to use administrative fines as sanctions. The penalty amount increase in proportion to the period during which the infringement lasted and the number of employees whose rights were violated.

As a result of conducted comparison one can state that the collective labour relations in developed countries have significantly transformed today. Collective agreements are increasingly taking on new functions, pursuing new goals, and thus they go beyond the appropriation of net income and the determination of working conditions. There is a joint search for solutions in the field of increased flexibility in production, flexible use of labour force, and the social stability in general.

Social partner organisations and the criteria of their representativeness should be separately highlighted in the contractual risks' regulation mechanism in SLR since the most acute and frequent disputes in the field of collective bargaining abroad are related to the recognition of the trade union as the representative of the interests of workers. So, the issue of the representation of interests of workforce is the centrepiece of the legislation that determines the order of collective bargaining process.

The definition of "contracting entity", a group of workers whose rights are to be represented in collective bargaining and its clear limits, goes prior to the recognition of the trade union as the representative of the interests of the employees. This group may include employees of the industry, certain enterprise, its business unit. Representatives of a certain profession, employees who perform definite labour functions within the enterprise, industry, region, and country can form a contractual unit.

Table 9.1 Basic Elements of Contractual Regulation of Social and Labour Relations in Certain Developed Countries

Country	Legal Regulation	Collective Bargaining Agreements' Levels and Types	Parties	Run of Validity	Content	Subject to Contract Agreement
Bulgaria	Labour Code of 1986 and subordinate legislation	National, municipal, industry, company level	Certain employer, employers' associations or organization and corresponding trade union (initial, association)	Agreements for one year, unless otherwise decided by mutual consent by the Parties	Collective agreements include details of labour and social insurance relations which are typically not set governmentally	Trade union members, other workers by written notice
United Kingdom	The UK legal system has not adopted any theoretical framework for the functioning of collective agreements	Domestic, industry-wide, district, local, agreements for different grades of workers, company level. Substantive and procedural agreements	Company managers, shop stewards, trade unions and employers' associations, associations of employees, Grand National Consolidated Trade Union, Confederation of British Industry (CBI)	Agreements for indefinite or definite period of time	Determination of pay, human resources, employment, recruitment and dismissal, working hours, vacation, occupational safety and health, provisions for the elderly etc.	The Parties which have signed the Agreement
Germany	The Act on Collective Agreements adopted on 25.08.1969	National (industry), regional, shop/enterprise level. Framework and general agreements	Trade union or their associations, employers or their associations	Agreements for definite period of time; validity is almost always limited from one to up to several years	General agreements on employment conditions – they determine the minimum standards applying to the essential terms of employment, i.e. working hours, vacation, holiday pay, vacation bonuses and allowances etc.; pay agreements – they determine the minimum standards applying to wages, salaries, and pay grades for the entire industry, region or for an individual employer; special agreements regarding working hours, trainee allowances; provisions for the elderly and disabled	All workers

Italy	Title III, Book V (Libro V) of the Civil Code, enacted in 1942	National, sector or industry, company / enterprise level	Trade union or their associations, employers or their associations	Agreements for one year is most common	Contracting parties, data regarding ratione subiecti / enterprise, area, general rules on working places, obligations and rights arising between the Parties, job description, validity / basic rules on termination	The Parties which have signed the Agreement
Poland	Labour Code of 1974 and other legislation	Multi-workplace level, sometimes an industry, company / organisation level	Nationally representative union or local trade union organisation, individual employer or the representative body of a central union or enterprises' association	Agreements for indefinite or definite period of time	Agreements normally cover pay and its various components such as bonuses and allowances; working conditions also as regards to the rights of the workers substantiated by the character of labour in the industry or profession, allowable workplace exposure limits, social and cultural conditions, for instance organisation of working time, leave, health and safety and in-house social benefits, and mutual obligation of the Parties on the rules and forms of cooperation	All workers
USA	Titles 5 and 29 of the United States Code	Federal, state, municipal, enterprise wide / plant wide level	Employees and employers	Agreements for definite period of time (one to three years)	Parties, scope, aim, validity, working conditions and social rights of the workers, "industrial relations" between the Parties, conflict resolution procedures, unemployment insurance; additional pension fund regulations, early retirement, medical insurance, wages, job security, hours and working conditions etc.	All workers except: part-time workers, seasonal employees, outworkers, plant security, lower level managers
France	Labour Code of 1973 and other legislation	National, regional (local), company / enterprise level	One or several employers' associations, even a trade association, or any other grouping of employers or one or several employers acting individually	Agreements for indefinite or definite period of time	Collective agreements may contain information regarding trade-union rights, enterprise committees and company delegates; general conditions for remuneration of piece work; conditions of exercise of mutual responsibilities; social security guarantees; specific conditions of work; compensation for work-related expenses	The Parties which have signed the Agreement
Switzerland	Title 10 of Swiss "Code of Obligations" of 1911, as amended in 1971	There is no specific division by levels	Employees or their associations, employers or their associations	The run of validity is not specified	The collective agreements include predconditions of signing, content and termination procedures; other conditions as for the other relation between the Parties; implementation measures, joint bodies for implementation and control; joint social funds, participation rights, financial participation and so on.	The Parties which have signed the Agreement, other stakeholders by mutual written consent of the initial Parties

There are two basic principles used in order to solve the problem of the trade unions' representation [5], in particular:

1. "Exclusive bargaining representative" is commonly used in the countries where the collective bargaining process is carried out mainly at the level of the enterprise (United States, Canada). This mechanism is based on two legislated principles:
   - "contracting entity", i.e. determining the composition of the business unit on which behalf the trade union acts;
   - certification of trade unions, i.e. the issuance of registration certificate, which confirms that it is "an agent of collective agreement", "sole and exclusive" representative of the labour collective of the company or one of its units in collective bargaining relationship with the employer.

According to the labour laws of the United States and Canada, "the contracting entity" could be a group of employees who work for one employer, for several employers, in the same enterprise for the employer who owns several businesses, as well as employees of one specialty or profession.

In the United States the trade union's obtainment of a certificate depends on the extent of its support by the staff of "the contracting entity". Canada adopted a somewhat different system. Here, in addition to the extent of support received by the trade union from the workers, another criterion is used. This criterion is the percentage of members of trade unions in the total number of employees of "the contracting entity". In the United States the trade union in order to address the National Labour Relations Board (NLRB) with the request to hold a secret ballot of the staff under the established procedure has to collect the signatures of at least 30% of the employees of the company. The trade union obtains the right to represent employees in collective bargaining with an employer only if it gets more than 50% of the vote during the secret ballot (a majority trade union). The rest of the trade unions which are included in the newsletter do not receive any rights. If none of the trade unions receives the required number of votes, then the employees remain without an agent in the collective bargaining process and, accordingly, without a collective bargaining agreement. New elections may take place only after 12 months.

2. "The most representative trade union" is a typical system for sectoral collective bargaining process (Western European countries). In most countries, the criteria for defining the representation of trade unions to participate in collective bargaining process are developed and legislated. Both quantitative and qualitative parameters form the list. Moreover, the prevalence of these or those criteria distinctly differ from country to country. Many of them permanently seek for the optimal combination of quantitative and qualitative criteria for the representation of trade unions in the collective bargaining process.

Several countries, such as Germany and Italy [5, p. 29], basing on laws and practical experience developed criteria which are used as guides in the matter of recognition of the trade union's right of collective bargaining representation. So, in Germany the criteria are as following: the total number of members, participation in collective bargaining, the number of seats in the councils of the enterprises, financial resources of the trade union, the ability to put pressure on the employer in the course of negotiations, the positions in the government and social security bodies.

The Constitutions France and Italy provide the brightest presentation of the criteria of representation [12]. They include:
1. quantitative criteria:
    - the number of registered members;
    - number of employees whose interests the unions protect;
    - the amount of membership fees;
2. qualitative criteria:
    - the period of work in pursuit of members interests;
    - the rate of rights' protection: number of disputes with the protection of the employees' rights, the number of legal defence cases etc.;
3. delegation of the representation status in the government. In particular, trade unions remain deprived of the right to represent because of the relations with the structures that violate human rights. For instance, in France and Italy it is legalized that trade unions that enmeshed in collaboration with the fascists during the war remain deprived of the right to representation in the government. The unions which did not collaborate do represent the employees in the government.

As for Ukraine, according to article 5 of the Law of Ukraine "On social dialogue in Ukraine" [4] the general representativeness criteria for the subjects of the trade union party and the employer's party shall include:
1. legalisation (registration) of the above-mentioned organisations (associations) and their status;
2. for trade unions, their organisations and associations – the total number of their members, for employers' organisations and associations thereof – the total number of workers employed at the enterprises-members of the relevant employers' organisations;
3. sectoral and territorial branching.

The assessment of conformity of trade unions and associations thereof, employers' organisations and associations thereof with the representativeness criteria on the national and industry levels is performed by the National Service of Mediation and Reconciliation; at the territorial level – by the relevant departments (branches) of the National Service of Mediation and Reconciliation. The National Service of Mediation and Reconciliation and its offices, respectively, confirm the representativeness for the subjects of the trade union party and the employer's party once every five years.

Trade unions, organisations and associations thereof, and employers' organisations and associations thereof, including newly established ones, have the right to apply to the National Mediation and Conciliation Service (NMCS) and relevant branches thereof – either personally or by registered mail – for the assessment of conformity with the representativeness criteria given actual grounds therefore. The list of documents varies according to the level of the collective bargaining process. The documents submitted for their study, analysis and implementation of optional tests are referred to the Commission of the NMCS. The assessment of conformity with the overall staff numbers representativeness criterion, sectoral and territorial range is performed [8]:
- regarding the sectoral and territorial range – by analyzing the structure of the association, statutory documents, registration agreements, resolutions of the joint bodies of the association regarding the acceptance of the member;

- regarding the overall staff numbers – by carrying out sample checks on the submitted data authenticity.

The legislation also cites the cases where there are several trade unions at various levels. So, if there are several trade unions or their associations or other entities authorized by the staff to represent the bodies in the company (on state, industry, territorial levels), they should form a joint executive authority for the negotiation and conclusion of the contract or collective agreement. In this case, each trade union organization must decide on their specific obligations under the collective agreement or contract and responsibility for their failure. The executive body is formed on the pro-rata representation basis. Trade union organization that refused to participate in the representative body is deprived of the right to represent the interests of employees while signing the collective agreement or contract.

In the case of non-achievement of an agreement by the parties in the joint representative body the contract is entered into if it was signed by the representatives of trade unions or their associations or other entities authorized by the staff to represent the bodies which stand for more than a half of employees of the state, industry, territory.

9.4.   CONCLUSIONS

Basing on the analysis one can argue that using contractual regulation in risks' handling in social and labour relations in the form in which it is implemented today is inefficient and inadequate. There is a need to introduce the principles of social responsibility of all social partners. The comparison of the approaches that are used to solve the issue of trade unions' representation in the countries of North America, Western Europe, and Ukraine has proven that, in general, there is greater facilitation of labour relations' stability overseas. Such approaches reduce the severity of the representation problem, stimulate constructive participation of the parties in the collective bargaining process, prevent open labour disputes, promote the democratization of labour relations and enhance the effectiveness of international mechanism for risks' regulation in SLR. That's why today the possibility of changing the status of trade union organisations, in particular the criteria of the representativeness and the elaboration of the model of state stimulation of effective interaction between the social partners, needs further study.

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10

INTEGRATED BUSINESS STRUCTURES'
OPTIMIZATION PRINCIPLES

The article presents basic aspects of computer-integrated structures forming including grounded principles of optimization regarding structures of actions, processes, information, members of IBS, conduct as well as limitations of business and operations. Optimization of organizational structure of IBS enables to develop independent and autonomous activity systems providing regular transformation of forms and properties and optimization of inter-process communication.

10.1. PROBLEM STATEMENT

Tendency of modern economic development, as well as necessity in constant company's upgrades with respect to changing environment and the need of the company to have a competitive advantage on both national and international markets, requires improvement in company's structure formation principles. An organization of modern integrated business structures (IBS) [8n] is designed to provide adequate control, support creativity and company's optimality given the accelerating circulation of information flow.

At present stage in the leading economies of the world and in the world's economy in general integrated business structures play the main role (not a single company as a part of an integrated business structure). "The era of integrated structures" is marked by integrative tendencies of the global and national economies, globalization and information improvement in society based on the formation of the knowledge economy. Tight integration methods (consolidation and acquisition) along with soft forms of integration based on the principles of partnership, require the establishment of an appropriate mechanism to regulate their activity.

10.2. ANALYSIS OF RECENT RESEARCH

One should distinguish general organizational structure of integrated business structure with financial, scientific and research institutions from industrial organization structure that consists of multiple small companies which work together as a single unit with respect to a specific production scheme.

The concept of business model and business structure is relevant to all companies. However, there is no excessive literature on this topic [31], especially in relation to organization, economic, and strategy aspects. Instead, there are scientific papers regarding and presenting economic frameworks for analyzing businesses, such as profit models [27, 29] or strategy maps [13, 4]. Excessive literature considers also mathematical and statistical approaches [14, 5]. There are also paper considering typologies and taxonomies of IBS [19, 6, 18].

Separated category of papers regards e-business models including architecture for the product, service, information flows, business actors and sources of revenue involved [10, 31].

The organizational structure of a business coalition (BC) is a form of distribution and business cooperation, in which activities are aimed at solving problems and achieving goals [7].

The organizational structure of integrated business structures varies and depends on several factors:
- the territorial proximity of companies that make up its membership;
- the degree of productive communication between them;
- common product range and others.

10.3. INTEGRATION OF BUSINESS STRUCTURES

One should understand organization of an integrated business structure as a set of firmly interrelated elements that support the functioning and development of the business unit as a whole. Both employees and company's departments, which consist of a certain number of employees, can act as a separate element of organizational structure. The communication between the elements of an organizational structure can be supported by horizontal and vertical relations. The first are of the same level and maintain coordination processes, while the second maintain the function of commands. Due to the fact that integrated business structure is usually a complicated hierarchical system, there is a necessity in construction of another type connections especially if there are some other levels of government within the business unit.

With this type of bonds, a three-tier structure is formed: top management (usually a direction board of an integrated business structure) and lower level (employees directly managing the work of the others). The middle layer is also formed (usually top managers of a separate company within a business unit) and may also have several levels.

Different linear and functional relationships can be noticed in the structure of integrated business unit. The first reflects the ratio of the adoption and implementation of

management decisions, the movement of information between the so-called line managers who are fully responsible for the activities of integrated business structure as a whole or its individual members. Functional relationships connect with other functions of management. Accordingly, using a notion of competence of linear staff, headquarters staff and functional. Powers line managers are entitled to make decisions in all questions and issues of their organizations and departments, as well as give orders, binding other members of integrated business structure (units). Authority staff personnel has a limited right to plan, recommend, advise or assist, but not to give orders to other members of the integrated business structure [11n].

In modern management theory there are the following principles of organizational structure of large structural associations optimization [11n]: the subordination of the goals, objectives and basic requirements of the owner (parent company), the common goal, the optimal division of labor between managers and specialists within individual business units and between companies belonging to the integrated business structure, the presence of authority and responsibility of the individual companies for a particular area of operation due to vertical and horizontal types of relationships, matching functions and duties, the authority and responsibility, the adequacy of the socio-cultural environment that characterizes the degree of perception of organizational innovation, technological and other kinds of integrated business structure, the presence of control points for input and source of financial flows, characterized by the degree of fragmentation of the business definition of types of financial relationships between the business units [2].

For the application of optimization theory to solve specific problems, including optimization of the organizational structure of integrated business structure, one must perform a sequence of actions, called the statement of the optimization problem. It comprises the steps of:
- setting boundaries to optimize the system;
- the choice of a quantitative criterion, which allows to identify the best option (characteristic criterion);
- the definition of inner variables, which are expressed through characteristic criterion;
- building a model that describes the relationship of inner variables.

In our case the system is an integrated business structure. Limitations of the system set limits, separating it from the outside world. It is assumed that the relationship with the outside world if fixed. Initial choice of the system limitations may be too strict. To get an adequate solution one should include into the system additional subsystems, but this leads to an increase in the dimension of the problem. One should represent system in the form of isolated subsystems, any of which can be considered independently.

Criteria can be economic or organizational (minimum value, maximum sales volume, maximum profit) depending on the particular task. Regardless of which criterion adopted by the characteristic, it must take the maximum (or minimum) value for the best option [22]. If there is more than one criterion, then the problem becomes multi objective. There are many methods of solving multi criteria problems, but can this may lead to multi objective tasks. One of the criteria should be chosen as primary and

others should be marked as secondary. The primary criterion is used as the characteristic, and the secondary form constraints optimization problem.

Selection of independent variables is based on the following recommendations: to divide the variables that fluctuate over a wide range and variables that are fixed or vary slightly. The first – independent, second – parameters optimization problem. Parameters optimization problem is divided into fixed and those that experience fluctuations influenced by managerial actions. You must select only those variables that have the greatest impact on the characteristic criterion.

Model system describes the relationship between variables and reflects the impact of these variables on the characteristic criterion. The model includes the basic equations of material and economic balances; equations describing managerial processes in the system; inequalities that define the region of permissible values of variables. Thus, the problem in a form suitable for decision optimization method combines the characteristic criterion, the number of independent variables and a model that reflects the relationship of these variables.

Efficiency of formation of the organizational structure of integrated business structure, which ultimately turns into a successful (profitable) operation of all components of the system can be achieved, provided that the following requirements are observed in its formation:

• clearly articulating goals of integrated business structure;

• maximum simplicity of IBS structure. The simpler and clearer integrated business structure is built, the easier it is to manage the union;

• clear communication and appropriate feedback;

• establishment of unity of command in decision making as a prerequisite for unity of action, coordination, strength, combining efforts;

• limited number of employees, defined the norms of governance (control range, which depends on the type of each member of the IBS, complexity);

• limited number of levels of management: the more levels the IBS has, the longer is information upward and downward disposal, the more possibilities of distortion are observed in the transmission;

• a clear distinction and coordination functions of line management and functional services;

• precise coordination of individual members of the association by senior management of integrated business structure.

Among the most common mistakes in shaping organizational structures of IBS, one can define the following [12n]:

• The lack of clear management structure of IBS, formalized hierarchy;

• Plenty of horizontal connections. Usually this is a result of direction board desire to control as many of the processes going on inside the IBS as they can;

• Too deep vertical connections (many levels of subordination without installing horizontal communication links between the individual companies that make up the IBS). The consequence is unreasonable bureaucracy of IBS when all decisions are made at the top level;

• Lack of clear job commitment, formalization of functional and information links in the middle of the integrated structure [12n].

Support of non-optimized rotating structures within an integrated business structure results in large financial loss, duplication of functions, irresponsibility of company's employees, decreased initiative and other negative effects [16n].

10.4. ORGANIZATIONAL STRUCTURES OF IBS

Important role in the development of the organizational structure of IBS is played by its life cycle and size (Table 10.1). [16n].

Table 10.1 Determining the complexity of IBS organizational structure depending on its size and stage of the life cycle [16n]

Company name	Life Cycle Stages		
	Origin	Functioning	Liquidation
Small	Low level of complexity	Medium level of complexity	Medium level of complexity
Medium	Low level of complexity	Medium level of complexity	Medium level of complexity
Large	Medium level of complexity	Maximum level of complexity	Maximum level of complexity

Data in Table 10.1 indicates the trend of IBS to become more complicated in organizational structure associated with the increase in its size and move to the next stage of the life cycle. Table 10.1 also shows a tendency to simplicity of the organizational structure of small businesses and immutability organizational structure of medium and large companies in liquidation. This means complications and inability of systematic monitoring of individual business units with increasing their size and inability to make timely decisions on business reorganization.

One indicator of optimal organizational structure is the duration of documentation flow in the system. Factors that influence the duration of this process are [16n] the number of management levels, and the average number of managerial tasks to be solved at the same level, the complexity of administrative tasks, the level of automation of production (Table 10.2).

It should be noted that only a comprehensive automation control systems, especially those of large enterprise groups as integrated business structure, is effective. Current economic trends that lead to the emergence of new organizational forms of management require radically new control technologies. In this regard, based on theoretical generalization scientific sources [16n] the author formulated the principles of optimization of organizational structure of IBS. Author defines the rate of synergetic effect from the interaction of individual business objects to be the optimal criterium.

Table 10.2 Scale of determination of the level of management automation in organizational structure [16n]

The level of IBS automation	All levels of management and all work places are automated	All level of management and most of work places are automated	Most of management levels and all work places are automated	Half of management and half of work places are automated
Score	4	2	1	0

Distribution and origin of synergetic effect can be represented according to the different elements and levels: from the interaction of institutional rules and regulations, the coordination interaction parameters, from the association potentials integrated entities as a result of resource synergy [1] . The action of each of these types of synergies can have either one-time effect or spread out over a long period of time. Moreover, this synergy can also give positive, slightly negative or negative effects. This scheme takes into account the architectural approach to the formation of IBS and is based on the dual display of interaction between two members of the integrated structure (as may be extended during the development of customer relationships) [1]. That combination of knowledge about available resources (competence) of individual members within an integrated structure provides an opportunity to optimize their interaction on the criteria of maximizing the potential synergies and coordinated use of resources. Architectural division of members in integrated structure help to optimize the balance between aspirations and integrated part and to choose the options of consolidated distribution of resources [2]. As a tool in implementation of architectural approach for optimizing organizational structure one can apply the models of P. K. Anoxun, B.A. Erzykyana and balanced scorecard (BSC) [1]. This key performance indicators correlate with parameters of transformational changes that occur during development, as well as with integration constraints and architectural level expectations that arise from the presence of actors in IBS and regulatory functions they produce.

According to A. A. Pylypenko, with relatively high ability of small groups to accumulate collective goods in the absence of compulsion, the solution of optimization problem of organizational structure can be targeted either on the size of IBS after bifurcation transition, or on the insurance of compliance with the ruling of balance [24]. L. Sh. Lozovskaya, E. B. Starodubtsev, B. A. Rayzberg believe that only with proper formal institutional structure of integrated structure one may solve the problem of increasing the usefulness of integrative collaboration [25].

However, the creation of an integrated space able to lead to an increase in inertia with respect to changes in the environment. Accordingly, technological breakthroughs can expand or destroy existing area of competence [7]. The interaction of the aforementioned trends can lead to so-called strategic tipping point (a manifestation of traps active inertia), features which were examined in detail by I. Lazarev [17n]. In this case, to overcome the negative effects one should accept the offer of P. O. Skobyeleva, to consider the integrated network as a basis for dynamic resource allocation, in which resources or demand for them unpredictable ways change in the decision making process [19]. Thus the capacity of resources to individual members of the IBS updated concept

of dynamic capabilities of individual members of structure. This can be seen as the ability to update the resource capacity to ensure that changes in environmental conditions: reconfiguration of existing skills and functional abilities of members of the integrated structure. Accordingly, the criterion becomes the optimization of resources and opportunities (potential) on the set of markets and products that can cover IBS. At the same resources and strategies of different actors involved in the interaction with the positive impact (the principle of guaranteed result) for each participant IBS [9n].

10.5. OPTIMIZATION OF THE ORGANIZATIONAL STRUCTURE OF IBS

Optimizing the integration of structure can lead to withdrawal of some members of IBS resources and resource allocation to other distribution system IBS. Criteria such as redistribution should be minimizing mismatch between desired and obtained configuration of organizational structure by changing the shape of IBS and knowledge about the union of IBS members.

According to some scholars evaluation of the effectiveness of transition from one type of organizational structure to the more efficient is possible through reduced transaction costs (RTC), more competitive advantages of complementary assets (Ca) or display synergy (DS) [7]. Each structural unit of IBS strives to maximize its own profits (P (Ai) → max) increasing the level of consolidated profit (CP → max). Thus, we can evaluate the effectiveness or relevance to predict the transformation (optimization) organizational structure, including a system of constraints.

In view of the foregoing, the statement of the problem of optimization of the organizational structure of the integrated merger as presented in eq. 10.1.

$$CP\ (Ai) \to max;\ CP \to max$$

$$\begin{cases} \sum TB \to \min \\ C_{\text{н}} \to \max \\ \sum K_a^t \prec \sum K_a^{t+1} \end{cases} \tag{10.1}$$

The combination of these types of distribution will expand the resource constraints integrated business structure governing the distribution of impacts in the coordinate system "architectural projection-level of detail." As another criterion optimization of organizational structure, some scientists propose to consider quality of members of the association from the point of view of the IBS architecture requirements and needs of the environment management [28]. Putting these parameters as constraints optimization problem allows for a number of changes in the composition of integrated wholeness, namely [21]:

- View the basic membership of the association as the implementation of the integration development bifurcation point with the appropriate institutional review rules of relations within the integration space;
- Change complementary membership Association as a reflection of evolutionary dynamics on the deterministic phase can be seen as the accumulation potential for transformation and diffusion of knowledge by reviewing the parameters of the integrated network entities
- Diffusion between the core and complementary membership IBS that diversifies the configuration and parameters of the integration process.

Modeling these viewing options organizational structure allows IBS development potential correlate of structuring the relationship between integrated members of the association on the grounds modeling capabilities of IBS to reconfiguration and treat it as a narrow zone of compromise between autonomy separate business units and the broad guidelines of the integrated space. But some scientists believe that the main criterion that should be considered when optimizing organizational structure is the quality control of integration process [2, 28].

Thus, according to most scientists, the optimization of the organizational structure of IBS should be viewed as the use of principles, techniques and rules for reviewing and ensuring that business models, organizational structures, logistics processes and systems of interconnected members of the structure. Optimization is to enable an option upgrade competencies integrated integrity according to the needs of the environment and its realization − to optimize the parameters of the architecture of an integrated space through reconfiguration of IBS participants. The criterion to initiate reconfiguration procedure (according to the formulation of optimization problem (1) is a compliance accumulated resources and competencies desired outcome (overall and individual income), subject to the ruling of balance.

A. A. Pilipenko [23] has determined the mechanism of optimizing organizational structure of IBS provides a basis to spiral approach to mapping the dynamics of the integration process, highlighting two stages: bifurcation and necessitarian. According to this scholar, the optimization process can be separated for different levels: for individual member IBS it will lie in the choice of contractors (or strategic areas of business), which allows to maximize the return on your interactions with them (the presence of them) for the rest of the IBS - in determining the types and how they interact. At the level of the integrated network, this process will be to optimize the membership eligibility criteria for IBS consolidated goals and growth potential of IBS as a whole (its maximization) [9n]. Optimization of organizational structure limited to the creation of the correspondence between the target instructions participants IBS and system integration constraints. Optimization of the structure at the parent company can reduced to the design of new attractors based on the possible implications of emergent intelligence, by involving members of IBS with strong positions of power.

O.I. Pushkar, T.I. Lepeyko [16] determine that the theoretical basis reconfigured approach to optimize the organizational structure is not simply the imposition of restrictions on the selection of those degrees of freedom which bring integrity integrated to obtain useful results, and determine the result on a chain vertical integration and disintegration of a new IBS with more effective interaction of components. However

Anokhin believes should also consider the relationship between the frequency and level of reconfigured dynamic variability (mobilization) input to IBS elements [1]. This situation may be disseminated only to a basic or complementary membership of the IBS and their elements. That base composition of members of IBS will create set nodes that define a specific formulation and optimization of the organizational structure of IBS (especially when heterogeneous actors).

Based on these provisions, organizational structure optimization IBS becomes a process of harmonization of business models for its individual members with the business model of integrated education, depending on the produced new routines and changes in accounting features powerful balance. In this case, the view of some scholars regarding additional consideration in the limitations of those business units whose interests balances overbearing influence. However, the system of constraints to consider asymmetric distribution needed to create value-added resources between domestic economic agents [3]. This asymmetry creates mobility structure, and hence the possibility of nodal actors sanctions to other participants IBS [1].

Limit degrees of freedom IBS members by imposing integration constraints, coupled with the introduction of dynamic stereotypes loop behavior can implement dynamic standards regulating the functioning of integrated actors and distribute them within the architectural integrity of the integrated representation [1]. This distribution reduces the optimization of the organizational structure of IBS to develop interaction protocols of individual system components.

Anokhin [1] provides the basis for optimization of organizational structure put diffusion of knowledge and reconfiguration of IBS using system models multi agent interaction. However, V. Voinarenko [23] believes that this approach is reduced to develop principles and rules of matching – establishing mutually beneficial fit between their own interests and the parameters of the organizational structure of IBS, which allows members to transform the integrated structure of dynamic nature.

Thus, given the conceptual provisions reveal the content of the theoretical and methodological basis of optimization of the organizational structure of IBS providing representation of the structure of activities, processes, information, members of IBS, behavior, constraints and business operations. Optimization of the organizational structure of IBS allows for co-organization and many independent autonomous systems work by providing regular play shapes and properties of the whole and optimize the interaction processes. Targeting co-organization and combining knowledge integration within education can solve the problem of balancing centralization and decentralization of management integration process. The proceedings of this approach requires the development of criteria options for structuring and definition of the work within the organizational structure optimization IBS (Fig. 10.1.).

Each selected through circuit in Fig. 10.1. presenting principles and optimization problems must meet the logistics approach to meet the needs of each member of the IBS and thus ensure in each subsequent period of growth adaptation and transformation potential composition of individual business units involved in the project change [32]. One should emphasize the need for resource optimization study of the organizational structure of IBS as a whole and each of its allocated organizational components. Focusing on multi agent adopted approach to building functioning mechanism of IBS, it

is appropriate to establish the composition of participants IBS resource fields that will determine the need for transformation and the possibilities for their implementation [26]. This resource formed IBS compliance to the program changes the organizational structure. Thus all the requirements are defined in the formulation to optimize the organizational structure of IBS (including subordination and authoritative presence of asymmetry and opportunism in the relationship members IBS) for fully recycling program resourcing creating an integrated business structure.
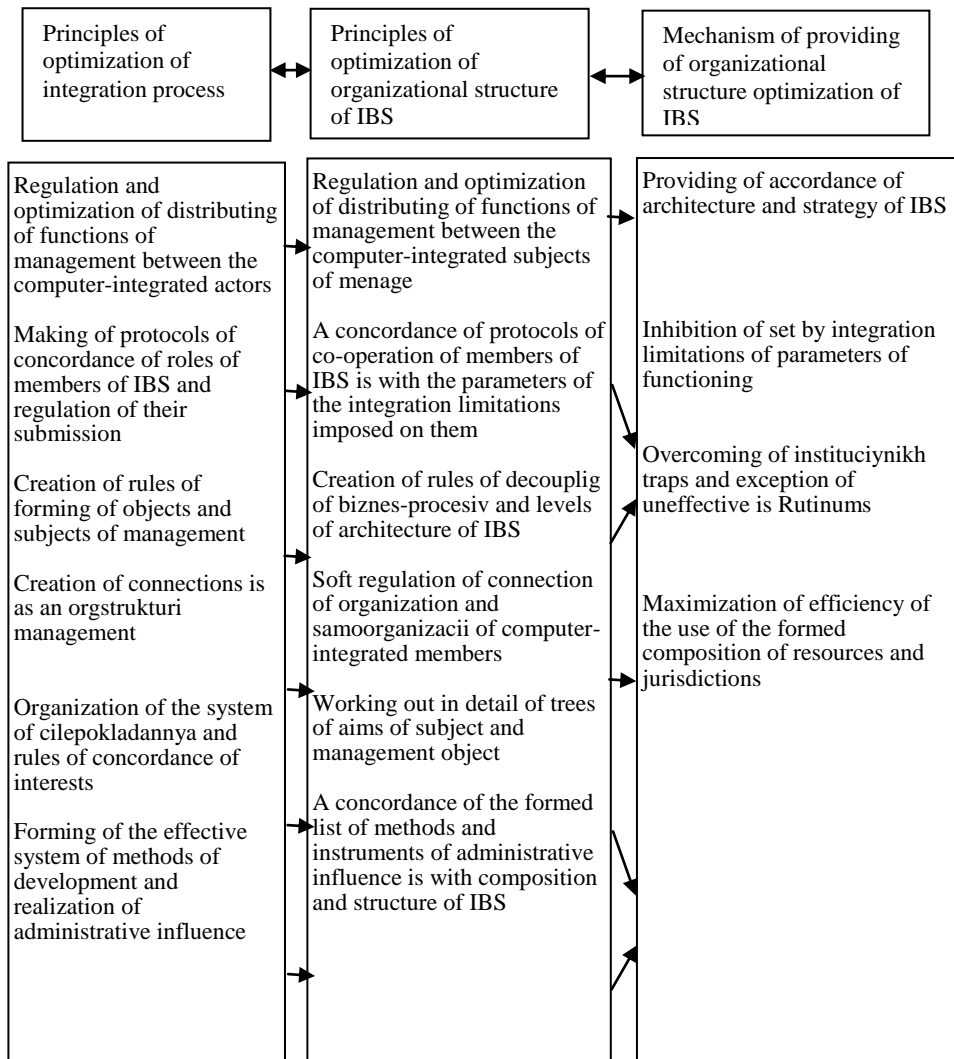
Principles of optimization of integration process	Principles of optimization of organizational structure of IBS	Mechanism of providing of organizational structure optimization of IBS
Regulation and optimization of distributing of functions of management between the computer-integrated actors	Regulation and optimization of distributing of functions of management between the computer-integrated subjects of menage	Providing of accordance of architecture and strategy of IBS
Making of protocols of concordance of roles of members of IBS and regulation of their submission	A concordance of protocols of co-operation of members of IBS is with the parameters of the integration limitations imposed on them	Inhibition of set by integration limitations of parameters of functioning
Creation of rules of forming of objects and subjects of management	Creation of rules of decouplig of biznes-procesiv and levels of architecture of IBS	Overcoming of instituciynikh traps and exception of uneffective is Rutinums
Creation of connections is as an orgstrukturi management	Soft regulation of connection of organization and samoorganizacii of computer-integrated members	Maximization of efficiency of the use of the formed composition of resources and jurisdictions
Organization of the system of cilepokladannya and rules of concordance of interests	Working out in detail of trees of aims of subject and management object	
Forming of the effective system of methods of development and realization of administrative influence	A concordance of the formed list of methods and instruments of administrative influence is with composition and structure of IBS	

Fig. 10.1. Mechanism ensuring compliance with principles of optimization organizational structure of IBS

10.6. Conclusions

The conceptual position described above reveal the content of the theoretical and methodological basis of optimization of the organizational structure of IBS, which give general information about, the structure, activities, processes, information, members of IBS, behavior, constraints and business its operations. Optimization of the organizational structure of IBS allows to organize many independent and autonomous systems through the provision of regular play shapes and properties and optimizing the entire interaction process. Targeting co-organization and combining knowledge integration within education can solve the problem of balancing centralization and decentralization of management integration process. The proceedings of this approach require the development of criteria options for structuring and definition of the work within the optimization of the organizational structure of IBS.

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List of authors

Ganushchak-Efimenko Lyudmila	Kyiv National University of Food Technologies
Juszczyk Marta	Electrical Engineering and Computer Science Faculty Lublin University of Technology
Khirs Oleg	National Aviation University, Kiev
Kobernyk Ivan	National Academy of Management, Kiev
Krapko Olena	National Aviation University, Kiev
Laskowski Maciej	Electrical Engineering and Computer Science Faculty Lublin University of Technology
Lyubomudrova Nadiya Petrivna	National University Lvivska Polytechnika
Matvieiev Viacheslav	Institute of Economy and Management National Aviation University, Kiev
Miłosz Elżbieta	Fundamentals of Technology Faculty Lublin University of Technology

Miłosz Marek	Electrical Engineering and Computer Science Faculty Lublin University of Technology
Oliynyk Olena	National University of Water Management and Nature Resources Use, Rivne
Plechawska-Wójcik Malgorzata	Electrical Engineering and Computer Science Faculty Lublin University of Technology
Shatilova Olena	Vadym Hetman Kyiv National Economic University
Skomorokhov Maksym	National Academy of Management, Kiev
Skulimowski Stanisław	Electrical Engineering and Computer Science Faculty Lublin University of Technology
Taras Hishchak	Ivan Franko National university of L'viv
Zakharchyn Myronivna	National University Lvivska Polytechnika