НОВЫЕ МЕХАНИЗМЫ ОЦЕНКИ ИНВЕСТИЦИОННЫХ ПРОЕКТОВ ТЕРРИТОРИАЛЬНОГО РАЗВИТИЯ

Ильин А.С.

старший преподаватель кафедры стратегии, территориального развития и качества жизни
Северо-Западного института управления - филиала, Российская академия народного хозяйства
и государственной службы при Президенте Российской Федерации (Россия),
199178, Россия, г. Санкт-Петербург, Средний пр., В.О., д. 57/43, sziu@sziu.ru

УДК 346
ББК 67.401.115

Цель представленного исследования заключается в поиске новых механизмов оценки инвестиционных проектов и выявлении связанных с ними аспектов территориального развития. В работе предлагается авторское видение ряда важнейших аспектов территориального развития.

Основываясь на методах функционального анализа и экономико-математическом моделировании, автор анализирует взаимосвязь основных социально-экономических факторов, определяющих устойчивость территории, моделируется алгоритм оценки уровня территориального развития. Автор предлагает подход к оценке эффективности территориального развития и модель принятия решения о реализации инвестиционного проекта на территории.

Научной новизной исследования является введение автором методики расчета коэффициента устойчивости территориального развития, формирование интегрированной модели принятия решения о реализации инвестиционного проекта территориального развития, основанной на использовании дифференциального подхода при учете динамических характеристик ресурсного и социально-экономического комплекса территории. Приведена структура и условия применимости предлагаемой модели.

Ключевые слова: развитие территории, факторы устойчивого развития, принятие инвестиционного решения, ресурсообеспеченность, ресурсоизвестность, ресурсодоступность, коэффициент территориального развития, эффективность инвестиций, факторы инвестиционной привлекательности.

Ilin A.S.

NEW MECHANISMS OF EVALUATING INVESTMENT PROJECTS OF TERRITORIAL DEVELOPMENT

The aim of the present study is to find new mechanisms for evaluating investment projects and identifying related aspects of territorial development. The paper presents the author's vision of a number of the most important aspects of territorial development.

Based on the methods of functional analysis and economic-mathematical modeling, the author analyzes the relationship of the main socio-economic factors determining the stability of the territory; the algorithm for estimating the level of territorial development is also modeled in the paper. The author proposes an approach to evaluating the effectiveness of territorial development and decision-making model to implement an investment project in the territory.

Scientific novelty of the study is the introduction of methodology for calculating the stability coefficient of territorial development, the formation of an integrated model of the decision on the investment project of territorial development based on the use of a differential approach, taking into account the dynamic characteristics of the resource and socio-economic complex territory. Author shows the structure and applicability of the proposed model.

Key words: site development, factors of sustainable development, investment decision-making, resourcing, resource awareness, resource availability, coefficient of territorial development, efficiency of investments, investment attractiveness factors.

Today the Russian territories faced with the uncertainty of their development. Regional administrations practically alone have to care about improving the quality of life to prevent migrations to more prosperous regions. However, any area also tends to intensify the processes of qualitative use of territorial resources. In the market formation process is carried out by means of investment and investment in territorial assets, in this case it does not matter who carries the investment process and how: the state, a municipality or a private investor. The analysis of scientific journals [1-4] showed that the question remains poorly developed evaluation of the effectiveness of the system model of territorial development. This is due to constant changes of both external and internal environments territory. Practically, there are no appropriate valuation models not only of financial effectiveness, but overall feasibility of investment projects on the territory. Consequently, the subject of this paper is: elimination of existing shortcomings. According to the authors, it will provide an appropriate mechanism for informed decision-making for the formation of a favorable investment climate in the territory.

The theoretical approach.

Functionally, the area should minimally provide residents with housing, work and leisure, while the progressive development will occur only if the increment of the population. In this case, sustainable development for the territory means performing functions livelihood of citizens through the effective use of internal, external factors and vector generating favorable expectations regarding future territory. Thus, we can talk about the system of formation of sustainable territorial development and the elements of this system.

Classification of the development factors.

To simplify the analysis, we divide them into internal and external. Then we identify the main internal factors - the number and quality of resources (people and their skills, productive capital, real estate), financial position territory, the conditions of development of business, the state of environment and infrastructure. The external factors include: geographical location, climate, the mechanism of power and macroeconomic situation in the country. [5] Favorable expectations regarding the future of the territory we define as willingness to make long-term citizen "investments" in the territory: to found a family; build and buy property, to be elected participate in elections by means of supporting civic initiatives and by extension their own. This category includes the "civic participation" - activities of a citizen in the communities and non-profit social-oriented non-profit organizations.

Forming a model of territorial development factors (TDF), we will write the level of sustainable development $L_{s.d.}$ as a function of these parameters:

$$L_{s.d.} = f\left(F_{ext.env..}, F_{int.env.}, F_{exp.}\right), \quad (1)$$

Graphically this is shown in Fig. 1. Obviously, the factors, affecting the level of sustainable development, are not just related, but complement each other.

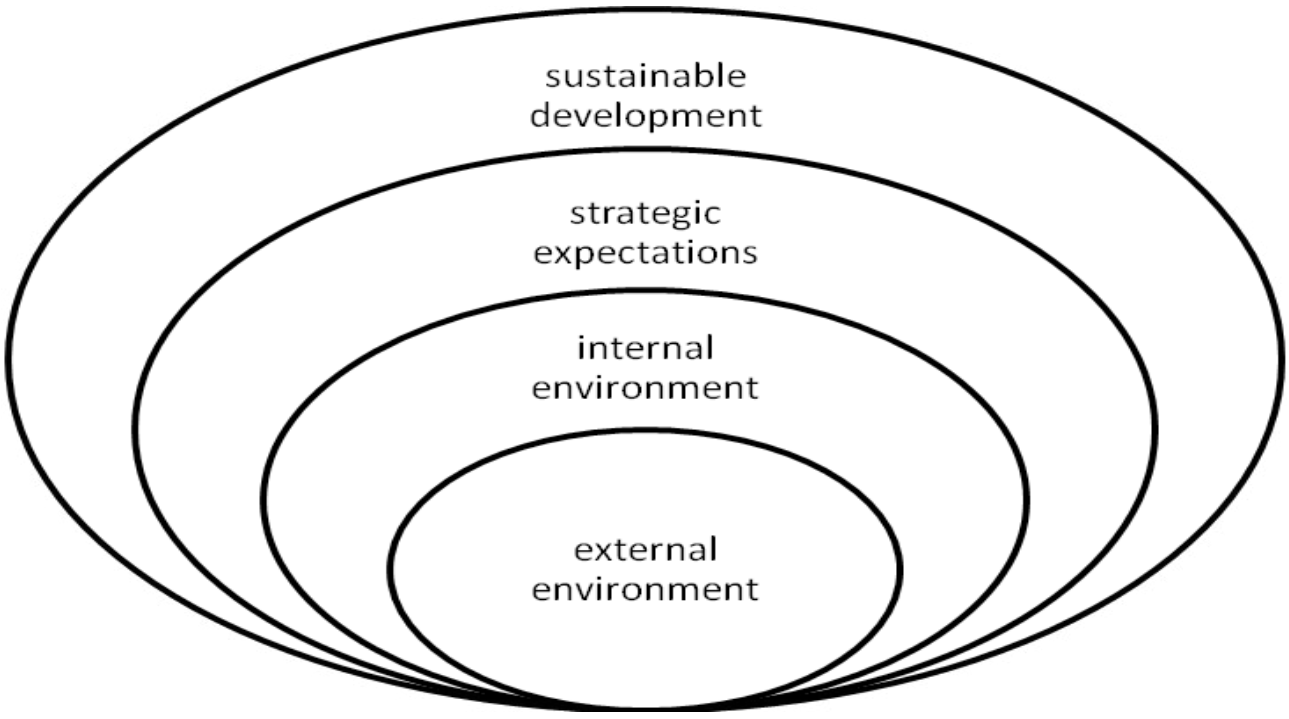

Fig. 1. Ratio factor for sustainable development.

We assume that the main external environment factors can be written as a functional $F_{ext.}$.

$$F_{\downarrow}(ext.env.) = f(F_{\downarrow}geo\ , F_{\downarrow}(clim.), F_{\downarrow}(macroec.), F_{\downarrow}(pow.mech.)) = = f(C_{\downarrow}(invest.), C_{\downarrow}(inf.const.), \Delta GNP, \Delta GDP, \Delta NI, GVA, GP, F_{\downarrow}(pow.mech)$$

(2)

Where

F_{geo} - geographic factors (availability of natural resources, topographic features, etc.),

F_{clim} - climatic factors (seasonal mean isotherms, seasonal rainfall, floods, droughts, etc.),

Here $F_{makroec}$ - macroeconomic factors, includes:

C - cost of inputs,

$C_{invest.}$ - average size of investment,

$C_{inf.\ const.}$ - average value of the costs of infrastructure construction (heating systems , electricity , sewerage, communications , etc.) ΔGNP - dynamics of gross national product, compared with last year, ΔGDP - dynamics of gross domestic product , compared with last year, ΔNI - changes in the level of national income , GVA - gross value added, GP - gross profit .

$F_{pow.mech.}$ - power mechanism factor, determining the degree of political influence on the economic and investment activities in particular in the area.

We write $F_{pow.mech.}$ here in the form of:

$$F_{pow.mech} = f(\Delta_{inv.act}, I_{org.pref..}, t_{d.m.}, T_{trans.c..})$$

(3),

Where

$\Delta_{inv.act}$ - dynamics of investment activity in the territory, $I_{org.pref.}$ - index of institutional preferences for investors, $t_{d.m.}$ - time from a political decision before its actual implementation, $T_{trans.c..}$ - transaction costs.

Transaction costs $T_{trans.c.}$ In the form:

$$T = f(C_{inf.}, C_{org.}, C_{d.m..}, C_{mon.}, C_{l.s..}),$$

(4)

$C_{inf.}$ - the cost of collecting and processing information,

$C_{org.}$ - the costs of organizing and negotiating,

$C_{d.m.}$ - the costs associated with management decisions,

$C_{mon.}$ - monitoring costs,

$C_{l.s.}$ - the cost of legal support due to appropriate support contract.

Factor of favorable expectations, regarding the future territory $F_{exp.}$ can be written as:

$$F_{exp.} = f(L_{soc.p}, L_{tr}, D_{civ.p}, \Delta_{p.})$$

(5)

where:

$L_{soc.p.}$ - The level of social policy areas,

L_{tr} - level of trust in government,

$D_{civ.p}$ - the degree of civic participation,

$\Delta_{p.}$ - population dynamics in the area.

In order to describe the level of the objectiveness of sustainable territory development we introduce stability factor of territorial development – $K_{s.t.d.}$ Analysis of the available literature has allowed us to identify the basic mathematical model to calculate the sustainability $K_{s.t.d.}$ [6-8]:

1) Method of sum places

This method assumes prior ranking of all territories in terms of characterizing the degree of sustainable development. Thus the first place best values assigned by calculating the sum of all the places considered indicators, you can set the level of grades areas of sustainable development.

2) Scores method

The main different between these two methods is that the areas which have the best values of parameters are assigned the highest scores. The main drawback of these two methods is that the difference between each pair of adjacent ranked among territories is always a constant, estimated at one point, when in reality the performance difference can be very significant.

3) Multidimensional average method

This method eliminates the deficiency of the two previous methods. In fact, the average value is calculated by a group of territories for each indicator that characterizes the investment climate. The performance of each region corresponds with the territory. Thus, each territory gets its coefficient for each indicator. Then the final one (coefficient) is calculated. The higher multidimensional average - the higher rating of the territory.

4) "Pattern" method

Comparing with the previous method, "Pattern" method uses the best value as a basis of a standardized indicator values instead the average for Russia. The existing method of assessing the investment climate is reduced to sufficiently primitive mathematical models, which main advantage is ease of use.

In our case, for the calculation of $K_{s.t.d.}$, is advisable to choose the method of multidimensional medium due to the large difference between the socio-economic status of the areas in the analysis of important differences between the accounting measures of territories. Then $K_{s.t.d.}$ takes the form:

$$\mathbf{K_{s.t.d.}} = L_{d.l.t.} * n \frac{\square}{\sum \square^{n} (L_{d.l.t.})},$$

(5)

$$\sum^{n} L_{d.l.t}$$

- the amount of development levels of territories,

n – number of territories.

Thus if $K_{s.t.d.} \geq 1$, then the area has a good level of sustainable development and favorable investment climate; if $K_{s.t.d.} < 1$, the territory is in the doldrums , and increases the risk of investment in the territory. In this situation, the territorial administration must make an adjustment for the above indicators of its territory, in order to obtain manageable coefficient values. We point out that increasing the number of areas involved in the assessment, will allow more accurately assess the test territorial entity.

Along with the importance of the choice of areas for investment is a management decision on the choice of the number of the proposed project will be important as well. Currently, there are a large number of investment projects assessment techniques [7]. An important step is the selection of projects for implementation. Improving the system of selection of investment projects and adapting it to changing conditions in the economy - largely determine the efficiency of investment policy and economic growth at all levels. The quality of the project selection procedure actually causes payback of invested capital, its alternative use options, evaluation of the investment potential of the area in which the procedure is performed. For efficient selection of investment projects the access to participate should be provided in the evaluation of those individuals would be affected by factors count, therefore, the economic efficiency of the investment project should reflect the interests of its compliance costs and participants.

However, we are interested not only in the effect of the investment project, but especially in decision-making of the project. The goals that are planned to achieve should meet the test of expediency A, which the authors define as a function of the need to N and a finite set of territorial resources [5]:

$$A = f(N, P(R_t)). \quad (6)$$

To make the formula more concretized we introduce the concept of the forecast effect of the project (E_f). The necessity in N in this case is defined as the difference between the planned and actual effect. For instance, the actual effect of the construction project may be zero:

$$N = \Delta E_f = |E_{plan} - E_{fact}|, \quad (7)$$

E_{plan} - the effect of the planned project

E_{fact} - the actual effect of the project

$f(R_t)$ – is a more complex function, since we are interested in more dynamic characteristics: resource awareness - (R_a) (the idea how to implement the project, its principal possibility to implement), resource availability - (R_{av}) (the existence of resources and their accumulation in the required amount), Resourcing -(R) (the actual availability of resources for the immediate start of the project). Any project, including investment projects of territorial development, in its life cycle has a different level settings R_a , R_{av} and R. For example, at the beginning of the investment project is defined resource awareness R_a , what means that the decision maker is ready to be engaged in the project. Then we define resource availability R_{av}, which will determine with what efforts the potential for implementation will be accumulated. Besides, defining resourcing of R, we can estimate the actual time required for the project.

Based on the economic substance of the derivatives [9], the relationship between the function of need and resource parameters can be written as:

$$R = E_f^{'} \; ; R_{av} = E_f^{''} \; ;; R_a = E_f^{'''} \quad (8)$$

Then the equation number 7 takes the form:

$$F_{ex} = \frac{\Delta Ef}{Ef} + \frac{E_{plan}^{'} - E_{fact}^{'}}{E_f^{'}} + \frac{E_{plan}^{''} - E_{fact}^{''}}{E_f^{''}} + \frac{Э_{plan}^{'''} - Э_{fact}^{'''}}{E_f^{'''}} \quad (9)$$

Its' necessary to point out some details in the work of the algorithm (Eq. 10): the time factor is used here in the meaning of the operational time. What means: per time step is taken specific ongoing project.

Assess the level of sustainable development of the territory and the model calculation of expediency factor (F_{ex}), while deciding on the investment project are multifactorial indices. They should be used in the implementation of major investment strategic focused projects. The organizational and economic decision-making mechanism proposed here, is a complex decision-making model keen on the implementation an investment project in the territory. Its structure is shown in Fig. 2.

Conclusion

Using this model would ultimately improve the competitiveness and attractiveness of innovative territorial entities [11, 12] as well as areas of territorial development - part of the territory of Russian Federation, which are widely provided with state support measures in order to accelerate social and economic development of the subject [10]. The proposed algorithms and model assessment can be, apparently, the theoretical basis for the creation of a system to increase the investment attractiveness of a particular territory, which take into account not only the investment specifics of the object, but also the specifics of the territory. Based on the authorities and management decisions in accordance with our proposals a comprehensive evaluation on the various projects can be given, regardless of their scope of application, which reduces the time and analytical burden on decision-makers. Calculation of the

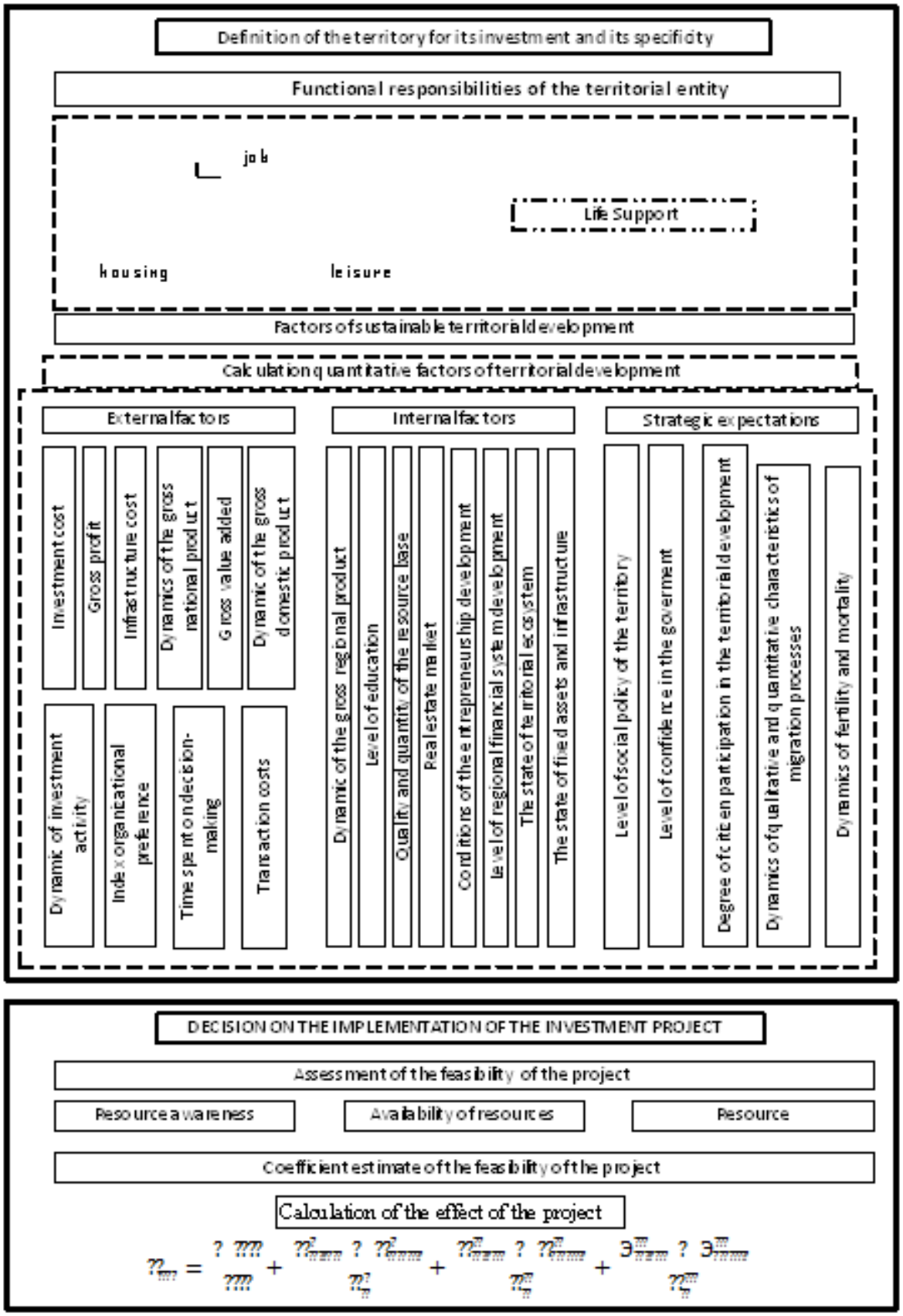

Fig. 2. The structure of model keen on the implementation an investment project in the territory.

factor of expectations (F_{ex}) can be the basis of cognitive software for rapid and objective monitoring the situation in the region.

References:

1. Burceva T.A. Effectiveness of implementation of the investment policy of the Kaluga region for its development // Regional Economy and Management. 2012 . № 4 (32).
2. Burceva T.A. Theory and practice of measuring the investment attractiveness of the territories: monograph; SUM branch in Obninsk. Moscow State University of Management , 2011. 233 p.
3. Ivatanova N.P. Sivachev C.F. Comprehensive socio- economic evaluation territory. Tula: TSU, 2006. 104 p.
4. Lineytseva L.N. Integral assessment of the level of socio - economic development of regions // Bulletin of the Tyumen State University. 2006 . № 7. Pp. 42-44.
5. Yanovsky V.V. Innovative development of a large city. Metropolis of St. Petersburg . SPB.: Publisher NWA-PA , 2006. 232 p.
6. Kurenkov AS Components of the investment climate and methods of assessment // Russian Entrepreneurship. 2011. №.6 (1). P. 32-36.
7. Blume E.A. Review of methods of assessing the investment potential of the region // Young scientist. 2013. № 7. P. 137-141.
8. Myopia MG Quantitative methods of analysis of multidimensional variables. Ural- Siberian Institute of Business ; Ed. AMB , 2006 - With 48.
9. The assumption is based on the idea of Engels : " ... only the differential calculus gives the opportunity to represent mathematical natural science not only state , but also the processes of movement." Its use in the economy is based on micro-and macroeconomic concepts derivatives formulated by economists of the Austrian school Menger (1840-1921) , Friedrich von Wieser (1851-1926), E. von Böhm - Bawerk (1851-1914), as well as British economist U.S. Jevons (1835-1882), is actively used in the theory of marginalism.
10. On the territorial development zones in the Russian Federation and on Amendments to Certain Legislative Acts of the Russian Federation: Federal Law of December 3, 2011 № 392-FZ [e-resource]. Access from ref.-legal system ConsultantPlus.
11. Yanovsky V.V. Management , image development and competitiveness of the region // Personality. Culture. Society. Interdisciplinary scientific and practical . Journal of Social and Human Sciences . T. VIII, MY. 3 (31), 2006. P. 205-221.
12. Ilyin A., Makhnev D., Yanovskiy V. Favorable Innovation Climate of the Region - Project Approach // Management Consulting.2013. № 8. P. 31-37.