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УСТОЙЧИВО РАЗВИТИЕ
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DEVELOPMENT OF METHODICAL APPROACHES TO OPTIMIZATION OF INVESTMENT INTEGRATION ASSOCIATIONS' STRUCTURE

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The paper systematizes existing approaches to the determination of integration structures effectiveness through diversification impact assessment on the value of business and through analyzing the internal capital market effectiveness.
The authors also identify changes in the estimation of companies' valuation during their transition from independent separate functioning to being an integration association's structure. The authors developed criteria to optimization of association's structure through making a decision on the inclusion of a new investor in the integration association.
The authors proposed a new optimizing of investment integration association structure.
__Key words:__ integration associations, investment intermediary, internal capital market, firm value.

Introduction. Most scientists allocate certain factors and conditions of inefficient functioning of domestic capital markets of integration structures.

Other authors in their scientific studies suggest defining integration structures effectiveness through the diversification processes impact assessment on firm value.

But absence of single established approach, and specific criteria for inclusion of new investor to the integration association predetermined necessity of further researches on optimizing of investment integration association structure.

1. Systematization of approaches to determination of integration structures effectiveness

1.1. Assessment of diversification processes impact on firm value

Analysis of existing approaches to determination of integrative structures effectiveness in economical literature allowed determining two directions: through the impact assessment of diversification processes in the company on its value; through the effectiveness analysis of internal capital market.

Thus, some scientists propose to evaluate the corporate diversification efficiency through the prism of diversification impact on the firm added value.

One of such methods is cumulative abnormal return (CAR). The essence of the method was surveyed in researches of Weston, Siu, Johnson [1] and MacKinlay [2].

If one apply this method for assessment of the need for inclusion of investor intermediary to the integration, it is possible to determine the

effect for integration structure both from related and unrelated diversification.

Another method of evaluating the diversification processes effectiveness and assessment method of diversification impact on the business value is based on the calculation and study of Tobin's Q Ratio which theoretically reflects the business estimation in standard of replacement cost, i.e. the estimation by current market prices of similar assets.

Tobin's Q is calculated as the ratio of the total market capitalization to the replacement cost of all its assets.

$$q = \frac{PB_a + БB_з}{БB_a + БB_з} \qquad (1)$$

where

q – Tobin's Q for a firm that that intends to enter integration association;

PB_a – equity market value of the firm that intends to enter integration association;

$БB_з$ – liabilities book value of the firm that intends to enter integration association;

$БB_a$ – equity book value of the firm that intends to enter integration association.

If equity market value coincides with equity book value of the firm, Tobin's Q is equal to 1.

If $q > 1$, it means that the market value exceeds the equity book value, in accordance it is concluded to include to the market value the certain assets of a integration's new member associations that are not subject to accounting, or cannot be measured. This Tobin's value encourages participants to make a decision to include a potential investor to integration association.

If the ratio $q < 1$, the equity market value is less than its book value. It means that the market underestimates the investor, and it can be concluded about the lack of profitable investment opportunities for its inclusion to the integration association, and the market does not see prospects of such institution.

Thus, we can say that comparison of the Tobin's Q value for integration association with its corresponding values for individual investors operating in the same sectors of the market as integration association, will let conclude on the resource allocation effectiveness within this association.

Since Tobin's Q depends on the firm market value and therefore on market expectations, the reliability of this indicator requires high development level of the latter.

Also, one must take into consideration that inflation artificially lowers the equity book value in contrast to its market value, so reliable estimation of Tobin's Q can be obtained only for economies that have achieved macroeconomic stability.

Another approach to determination of the integration association effectiveness is discounted cash flows methodology. The essence of this method is to determine the predictive growth values of a number of parameters that affect cash incomes.

Among positive aspects of this approach in the context of this research the following ones can be identified: calculations validity and consideration of all diversification synergistic effect components; among disadvantages there are problems with the prognostication of these effects and the complexity with discount rate choice.

1.2 Analysis of methodological approaches to determination of the internal capital market effectiveness

Let us analyze the effectiveness of existing methods for domestic capital market analysis. The possibilities of using these techniques for our research - that is, to assess the necessity of new investor intermediary inclusion to integration association on the investment market, are in the following.

To our opinion, one of the most common explanations of the diversification discount is inefficient allocation of invested capital between the integration association's units, that is the existence of insufficient internal capital markets. That is why domestic capital markets operate efficiently only in the case of increase in the integration association value.

Thus, an effectively working internal capital market will be the indicator of an efficient integration structure diversification, or inclusion of a new investment intermediary in its structure.

In scientific literature [3] three methods of internal capital market effectiveness

and, respectively, diversification efficiency evaluation.

Let's describe each of them in the context of possibility of their usage to assess the need of new investment intermediary inclusion into the integration association.

As our analysis evidence, the first group includes indicators that are based on regression coefficients in which a dependent variable is presented by the investments, and independent ones – by Tobin's Q coefficient and cash flows. The first indicator is coefficient of integration structure investments' sensitivity to the Tobin's Q median value of individual investors operating in the same investment market segment. The essence of this indicator is shown in the following dependence: the more effective integration association is, to the greater extent its investment decisions must be responsive to changes in investment opportunities. If domestic capital markets are as effective as foreign markets, then it is assumed that the same correlation between investment and Tobin's Q will be observed both for integration structures and separate investment companies.

For direct evaluation of the internal capital market effectiveness in economic literature [4] it is proposed to estimate regression of the following form:

$$I = E3 \cdot \gamma + q \cdot \beta + \varepsilon \qquad (2)$$

where

I – firm investments;

q – Tobin's Q marginal value;

$E3$ – vector of exogenous explanatory variables;

γ, β – weights;

ε – statistical error.

If the coefficient β is higher for separate companies than for integration structure, it means that integration association does not respond appropriately to changes in investment opportunities.

Another indicator of effectiveness, that is calculated using regression analysis, is investments' sensitivity of separate company within the integration structure to the cash flows of other participants within the same association. Thus, in the case of integration association's internal capital market effectiveness the cash flows of all association must have a greater influence on the investments of an integrating individual investor than on its own cash flows. In this case, regression takes a little different look: now investments depend not only on Tobin's Q, but both on its own cash flows, and total cash flows of integration association.

The regression, presented in the research of A. Gautier and M. Hamadi [5], is constructed on the same principle. Internal capital market is considered as effective when the integration company resources are invested in the most profitable areas of business. The main difference between this regression model and the previous one is that according to the approach, developed by H. Shin and R. Stulz [6], it is necessary to evaluate integration association's investment opportunities through revenue growth and Tobin's Q of individual companies that are its constituents. Instead of it, A. Gautier and M. Hamadi use *ROA* (return on assets) index due to the lack of data for Tobin's Q calculation.

The regression dependence for the estimation of internal capital markets activity and effectiveness within this approach (with respect to the object of study) is as follows:

$$\frac{I_{ik}(t)}{TA_i(t)} = \alpha_1 \frac{CF_{ik}(t)}{TA_i(t)} + \alpha_2 \sum_{j\neq i\in k} \frac{CF_j(t)}{TA_i(t)} + \alpha_3 \theta_{iк}(t) + \alpha_4 \theta_к(t) + \alpha_5 \log TA_к(t) + \eta_к + \varepsilon_{iк}(t) \quad (3)$$

where

$$\frac{I_{ik}(t)}{TA_i(t)}$$

– ratio of investments to capital assets of separate investor i of K integration structure in t year to total value of i investor's assets in t year;

$$\frac{CF_{ik}(t)}{TA_i(t)}$$

– ratio of i investor's cash flows of K integration structure in t year to total value of i investor's assets in t year;

$$\sum_{j\neq i\in K} \frac{CF_j(t)}{TA_i(t)}$$

– total cash flows of $j\neq i$ investors of K integration structure in t year weighted on total value of i investor's assets in t year;

$\theta_{iK}(t)$ – value of investment opportunities of i investor in t year;

$\theta_K(t)$ – value of investment opportunities of K integration structure beyond the firms-investors in t year;

$\log TA_K(t)$ – logarithm of total assets of j investors of K integration structure. Is used as a control variable;

η_K – specific for integration structure effect (unexpected effect).

It should be noted that the essence of internal capital market activity is as follows: if integration structures govern their internal investment capital market, companies' - members' investments depend on their own cash flows and cash flows of other companies. In this case, a positive α_2 value means that the internal capital market of integration association is active. If integration association does not redistribute resources among its members, the company's investments do not depend on the cash flows of other intermediaries and $\alpha_2 = 0$.

According to this approach internal capital market effectiveness means that: a) the company's investments must depend on the total amount of resources available for integration association; b) company's investment opportunities growth should help to increase its investments and automatically lead to other integration association members' investments decrease. So, according to this, domestic capital market efficiency is characterized by the following fulfilled conditions: $\alpha_1 > 0$, $\alpha_2 > 0$, $\alpha_1 = \alpha_2$, $\alpha_3 > 0$, $\alpha_4 < 0$.

If integration structure is financially limited, in other words it has no free cash flows, it cannot fund all projects. Then its executives have to choose how to allocate resources. Resources will be allocated efficiently if the size of investments is determined only by opportunities of investors - association members'. If integration structure has free cash flows and can fund all projects then $\alpha_3 = 0$, $\alpha_4 = 0$.

The second group of methods for assessing the integration structures' internal capital market effectiveness is based on correlation between investments and investment opportunities of their departments. The stronger their correlation is, the more effectively investments are distributed within the company.

According to this approach, decision should be made on the relative index of investment (RINV) base, which characterizes weighed by revenue corrected value of investments of association members with a high Tobin's Q

after deducting weighed by revenue corrected value of investments of intermediaries with a low Tobin's Q.

$$RINV = \frac{\sum_{j=1}^{k} S_j \left(\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} - \sum_{j=1}^{n} w_j \left(\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} \right) \right) - \sum_{j=n-k+1}^{n} S_j \left(\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} - \sum_{j=1}^{n} w_j \left(\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} \right) \right)}{TS} \quad (4)$$

where

S_j –j revenue of investor;

w_j – correlation between j revenue of investor, and total integration structure's revenue;

I_j – capital investments of j investor;

$\left(\frac{I}{S}\right)_j^{ss}$ – ratio of investment to revenue for a separate company's median independent that operates in the same investment market segment according to the three-digit code SIC, as j company;

TS – total integration structure's revenue

$\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss}$ – ratio of investments to revenue, corrected for investment market segment.

$\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} - \sum_{j=1}^{n} w_j \left(\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} \right)$ – ratio of investments to revenue, corrected for investment market segment and the company.

The next parameter to be tested within the scope of this approach is a relative value added (due to reallocation of resources) RVA. For its calculation one must take the investment value of company - association member and investments, corrected for the market segment of this investor, and weigh them by the difference between the median values of Tobin's Q for the market segment, to which this investment company belongs, and by revenue value of Tobin's Q for integration structure in general.

Formally RVA is calculated by the following formula:

$$RVA = \frac{\sum_{j=1}^{n} S_j \left(q_j - \bar{q} \right) \left(\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} - \sum_{j=1}^{n} w_j \left(\frac{I_j}{S_j} - \left(\frac{I}{S}\right)_j^{ss} \right) \right)}{TS} \quad (5)$$

where

q_j – is the median value for a separate independent investment company that operates in the same segment of investment market according to the three-digit code SIC, as j investment company;

$\overline{q}$ – weighed by revenue average value of integrated structure's Tobin's Q

There is another method of calculating *RINV* and *RVA*, which is quite similar to the mentioned above, the only difference is that assets are used instead of revenue. In addition, for the purpose of our research it is also possible to calculate the absolute value added rate by reallocating resources (AVA), the technology of calculation differs slightly from RVA's:

$$AVA = \frac{\sum_{j=1}^{n} BA_j \left(q_j - 1\right)\left(\frac{I_j}{BA_j} - \left(\frac{I}{BA}\right)_j^{ss}\right)}{BA} \quad (6)$$

where

BA_j – book value of j company's assets;
BA – book value of all integration structure's assets.

It is worth noting that positive *RINV* and *RVA* values indicate that integration association invests more in companies with a high Tobin's Q than with a low Tobin's Q. In turn, this indicates that the association's domestic capital markets carry out their tasks effectively and redistribute resources to the most perspective projects.

The third approach to the internal capital market effectiveness evaluation operates with the indicators that characterize the excessive cost of integration association compared with the whole set of separate companies. It should be noted that this indicator of excessive cost is not directly related to the internal capital market effectiveness, but it allows determining the level of effective internal capital markets impact on the increase of integration association's value. This method is reviewed in detail in the first approach - assessment of the company's diversification processes impact on its value.

2. Development of criteria for the inclusion of a new intermediary into the integration structure

To our opinion it is necessary to use this approach, but it requires some modification to ensure its usage precisely for the assessment of diversification processes in the market. It should be noted that for integration associations it is impossible to use revenue value or operating profit value as a weighing indicator.

Firstly, revenue is not considered to be a financial indicator of investment companies' activity, it is more related to the results of industrial and commercial companies' activity.

Secondly, given that one of the diversification motives is tax burden optimization, which involves redistribution of income and expenditure within the integration association in order to reduce the overall tax burden, the usage of operating profit value also looks quite doubtful.

Thirdly, taking into consideration different taxation approaches of all companies' activity and different tax base, the usage of profit as a weighing indicator is considered unreasonable.

Fourthly, taking into consideration a general tendency to usage of all available tools of tax burden reduction, official profit indicators of different market segments cannot perform as an objective guideline that will allow determining the segment's average data correctly.

In consideration of this, we propose to modify the surplus value calculation through usage of the assets' values of the companies to be included in integration associations as a weighing indicator.

According to the performed analysis, a decision to include a new investor to the integration structure should be made based on the excessive value (*EV**) modified index, which allows to detect changes in the valuation of a company in its transition from independent separate functioning in the market to being a part of an integration association. At the same time cost characteristics should be weighed by assets' book value that will allow to:

1) consider the participant's market value share per one unit of his assets' book value correctly;
2) consider the unit of integration structure presence in the particular market segment correctly.

$$EV^* = \frac{MV^{ik}}{AVA^{ik}} - \sum_{j=1}^{n} \frac{AVA_j}{AVA^{ik}} \cdot \frac{MV_j^{mm}}{AVA_j^{mm}} \quad (7)$$

where

MV^{ik} – market value of integration association;
AVA^{ik} – book value of all integration association's assets;

n – number of market segments in which the integration association operates;

AVA_j – assets book value of companies-integration association members, that operate in j market segment;

AVA_j^{mm} – average or median value of assets book cost for the group of companies focused in j market segment;

MV_j^{mm} – average or median value of market cost for the group of companies focused in j market segment.

In the case of positive indicator's value the decision to increase company's diversification level should be recognized appropriate.

Conclusions. We have come to the conclusion that the decision to include a company in integration association's structure should be made on the base of modified index of excessive value, which allows detecting changes in the valuation of business companies, weighed by book value of their assets. Surplus value index allows evaluating the efficiency of diversification processes in integration associations of investors.

Based on the analysis proved that the decision to include new investment intermediary formation of integration in the investment market should be taken based on the modified index of excessive value to detect changes in the valuation of investment intermediaries when moving them from a separate independent functioning of the investment market of integration association. This cost characteristics of the objects of study are weighted by book value of assets, which allows: 1) to correctly take into account the market value of the share market participant, per unit book value of its assets;

2) properly consider the penetration of integration education on a particular segment of the investment market.

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