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Economic Theory

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THE G2B THEOREM OF BUSINESS VALUE GROWTH RATE FROM GLOBALIZATION PERSPECTIVE

Abstract

The article brings up a timely problem standing on the edge of economics and mathematics and offers a way to its practical solution. Despite numerous explorations of the mathematical side of the problem [1–5], it has not only remained unresolved in practice, but even fell out of sight of the majority of specialists. Essential economic consequences of its existence forced the authors to conduct a special research aimed at its revealing and mitigation, a part of which is presented in this work.

The paper formulates and proves the G2B theorem of business value growth rate. It shows that «greater value grows faster». It substantiates the expediency of capital concentration and stipulates the inevitability of further development of globalization process. The theorem is proved taking into account a «G-hyperbolism» effect, which consists in non-identicalness of the estimates de-

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rived from such comparison criteria, as $X - Y$ and $\frac{X}{Y}$. The authors put forward a model of «G-hyperbolic leverage» which permits to «manipulate» economic indicators for business value maximization.

Key words:

Globalization, synergetic effect, merger, business appraisal, business value, theorem of value, theorem of business value growth rate, comparison, indices, G-hyperbolism, G-normalization procedure, G-Hyperbolic Leverage model.

Globalization is among the most important processes that predetermine world development in the third millennium. The theme of globalization is in the spotlight of scientists, businessmen, and politicians. There is no common interpretation of the concept of «globalization». But the attitude to globalization is probably even more polysemantic than the interpretation itself. Nevertheless, hardly anyone can object to the significance of globalization since its consequences can be observed in economic, social, cultural, and other fields of human life even today.

In our previous publications [1], we have examined one of the main globalization causes – the economic one, which appeared to determine largely the inevitability of globalization development [www.galasyuk.com]. We have analyzed the processes of capital concentration and centralization from the perspective of the fundamental theorem of value – G1 Theorem (for details see [1]), and formulated the following condition of reaching the synergic effect of value when companies merge: **for the value of a combined company to be higher than the arithmetic sum of values of the companies undergoing a merger, the combined company's coefficient *e* of, which reflects expectations of changes in its momentary value, must be higher than the weighted average value of respective parameters of the companies merging on the basis of their momentary value** [www.galasyuk.com].

The above-stated condition can be analytically represented in the following way:

$$e_\gamma > \frac{M_\alpha \cdot e_\alpha + M_\beta \cdot e_\beta}{M_\alpha + M_\beta}, \qquad (1)$$

where:

e_γ – coefficient that reflects expectations of changes in momentary value of «Gamma» company in the future time period Δt. «Gamma» company appeared from the merger of «Alpha» and «Beta» companies;

M_α – momentary value of «Alpha» company (in monetary units);

M_β – momentary value of «Beta» company (in monetary units);

e_α – coefficient that reflects expectations of changes in momentary value of «Alpha» company in the future time period Δt;

e_β – coefficient that reflects expectations of changes in momentary value of «Beta» company in the future time period Δt.

In other words, for the value of «Gamma» to be higher than the arithmetic sum of values of «Alpha» and «Beta», the $e\gamma$ parameter of «Gamma» must be higher than the weighted average value of the corresponding parameters of «Alpha» and «Beta» at their momentary values [www.galasyuk.com].

Thus, it was discovered that the synergetic effect of corporate mergers and acquisitions was achieved primarily through coefficient *e* reflecting expected future momentary value of a company. It might seem that the analysis could be finished now, since the mechanism of M&A influence on companies' values has been discovered and the economic basis of capital concentration has become evident. However, it is too early to put an end to this issue. Another no less important fact of value growth, which drives capital concentration, was left unconsidered in our analysis. We have formulated it as the G2 Theorem, which comes second on our list of value theorems.

Theorem G2: ***Given the coefficients reflecting expectations of changes in the objects' momentary values in the future time period are equal, the object with higher momentary value has higher expected rate of change of the momentary value.***

For businesses, the G2 Theorem transforms into the G2B Theorem.

Theorem G2B: ***Given the coefficients reflecting expectations of changes in the businesses' momentary values in the future time period are equal, the business with higher momentary value has higher expected rate of change of the momentary value.***

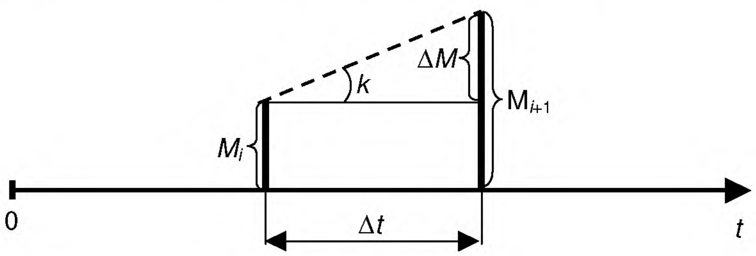
Proving G2B Proof.

To prove the G2B Theorem, let us first consider an elementary model of the object's momentary value change (Figure 1).

A series of object's momentary values at successive points of time constitute a process of change of the object's momentary value. As we have demonstrated earlier [1; 2, p. 196–203], **under the numerical analysis, the elementary process is characterized by the absolute value of corresponding dimension and by the coefficient, a relatively dimensionless value, at every point of time.**

Figure 1.

Elementary Model of Momentary Business Value Change Process



Legend:

– – – – straight reflecting expected direction of momentary business value change process;

k – slope of the straight which reflects expected direction of momentary business value change process;

M_i, M_{i+1} – momentary business value at points of time i and $(I + 1)$;

ΔM – change in momentary business value in period Δt.

As used in the task of business appraisal, the absolute value of corresponding dimension is the momentary business value which represents the results of past business activity. **The dimensionless coefficient represents expectations of changes in business's momentary value in the future.**

Then, at the point of time t_i the process of change of business momentary value will be characterized by the business's momentary value M_i at this moment of time and by the value of coefficient e_i reflecting expectations of changes in business's momentary value in the future, which can be determined as $e_i = M_{i+1} / M_i$ [1].

The value of e predetermines the value of angular coefficient k of the straight line reflecting expected direction of the object's momentary value change process (Figure 1).

Now, let us demonstrate the correlation between e and k. As is well known, the slope of straight line is equal to tangent of its angle of inclination, which, in its turn, is calculated as a ratio of opposite leg to contiguous leg. As shown in Figure 1, the slope of the straight line reflecting expected direction of change in business's momentary value is equal to the ratio of expected value of change in business's momentary value ΔM in period Δt to length of this period, i. e. $k = \Delta M / \Delta t$.

To demonstrate the interrelation of e and k, let us make some simple transformations [1]:

$$e = \frac{M_{i+1}}{M_i} = \frac{M_i + \Delta M}{M_i}, \quad (2)$$

$$\Delta M = M_i \cdot e - M_i = M_i \cdot (e - 1), \quad (3)$$

$$k = \frac{\Delta M}{\Delta t} = \frac{M_i \cdot (e-1)}{\Delta t}. \quad (4)$$

Having analyzed (4), which represents interdependence of e and k, it becomes possible to trace how the dimensionless coefficient e transforms into k expressed in monetary units/time units, e. g. hryvnya/month. **Thus, the value of *k* represents the expected rate of change of momentary value of a business.**

In general, the model of change in business's momentary value can be presented graphically (Figure 2).

Assume that e_A, which reflects expectations of changes in momentary value of business A in the future period Δt, is equal to e_B, which reflects expectations of changes in momentary value of business B in period Δt, i. e. $e_A = e_B = e$. Assume also that the momentary value of B (M_B) is higher than the momentary value of A (M_A), i. e. $M_A < M_B$. According to (4), the coefficient k_A, reflecting expected rate of momentary value change for business A, will be:

$$k_A = \frac{M_A \cdot (e_A - 1)}{\Delta t}. \quad (5)$$

Correspondingly, coefficient k_B, reflecting expected change of momentary value for business B in the future period Δt, will be:

$$k_B = \frac{M_B \cdot (e_B - 1)}{\Delta t}. \quad (6)$$

To compare the values of k_A and k_B, let us divide k_B by k_A:

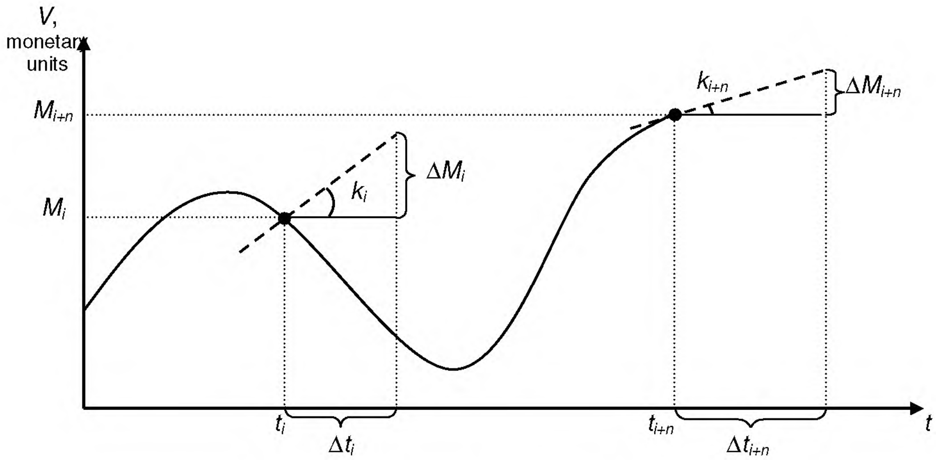
$$\frac{k_B}{k_A} = \frac{M_B \cdot (e_B - 1)}{\Delta t} \Big/ \frac{M_A \cdot (e_A - 1)}{\Delta t}. \quad (7)$$

Since $e_A = e_B = e$, (7) will take on the following form:

$$\frac{k_B}{k_A} = \frac{M_B \cdot (e - 1)}{\Delta t} \Big/ \frac{M_A \cdot (e - 1)}{\Delta t} \quad (8)$$

Figure 2.

The Model of Change in Momentary Value of a Business



Legend:

 – straight reflecting the direction of momentary business value change process;

- - - - – straight reflecting expected direction of momentary business value change process;

M_i, M_{i+n} – momentary business value at points of time t_i and t_{i+n} respectively;

k_i, k_{i+n} – slope of the straights, which reflect expected direction of momentary business value change process at points of time t_i and t_{i+n} respectively;

ΔM_i, ΔM_{i+n} – expected change of momentary business value throughout periods Δt_i and Δt_{i+n} respectively;

Δt_i, Δt_{i+n} — anticipation periods.

Having simplified (8), we will get:

$$\frac{k_B}{k_A} = \frac{M_B}{M_A}. \qquad (9)$$

Since $M_B > M_A$, the following inequality will be true:

$$\frac{k_B}{k_A} > 1. \qquad (10)$$

Finally, (10) transforms into:

$$k_B > k_A. \tag{11}$$

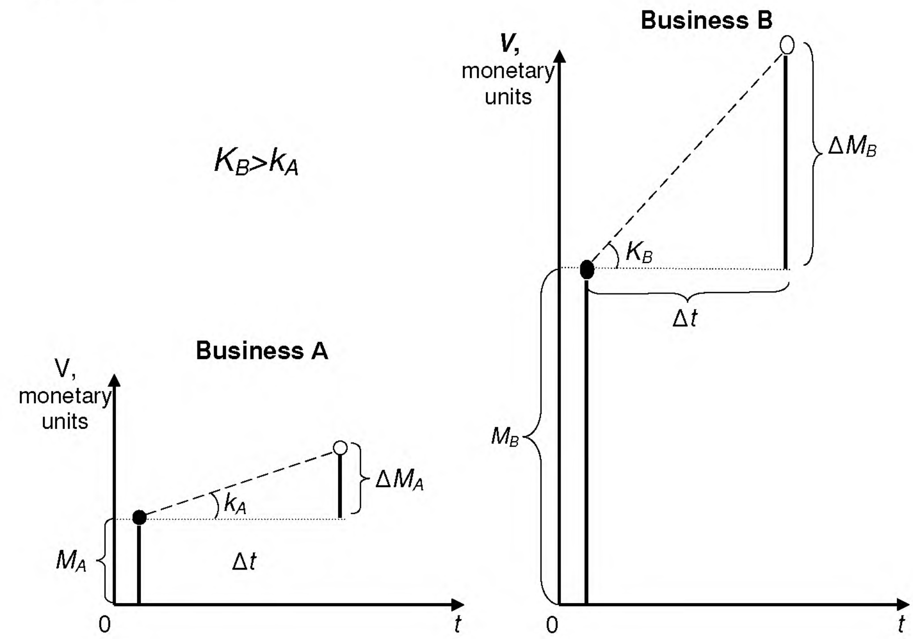
Thus, under given period of time Δt and equal values of e, the business with higher momentary value has higher value of k, which reflects expected rate of change of the business's momentary value (Figure 3).

At that, it is necessary to acknowledge that the G2 and G2B Theorems work irrespective of the value of expectations e about the changes in momentary values of businesses A and B in the future period Δt.

Now, the G2B Theorem can be considered to be proved.

Figure 3.

Momentary Values of Business *A* and Business *B* at Time t_i and the Subject's Current Expectations of Their Future Change Given $e_A = e_B = e$



G-Hyperbolism Effect
and Its Practical Implementation

From our previous research, we have established the existence of the «G-hyperbolism» effect that consists in non-identicalness of estimates of two compared quantities, derived from application of such comparison criteria as $X-Y$ and $\frac{X}{Y}$ [3; www.galasyuk.com]. It was shown that the G-hyperbolism effect was inherent to such comparison criterion as $\frac{X}{Y}$. Moreover, there were only two cases when G-hyperbolism effect did not emerge: first, if the two quantities compared were identical; second, if the quantity in denominator of $\frac{X}{Y}$ equalled 1. Besides, we have shown how to compare two quantities by using the comparison criterion $\frac{X}{Y}$ and eliminating the influence of G-hyperbolism effect through G-normalization procedure [3; www.galasyuk.com].

Influence of G-hyperbolism effect on the result of comparison is often so significant that it cannot be neglected. At the same time, the results of using G-normalization procedure, which was advised to eliminate the influence of G-hyperbolism effect, are unusual from the standpoint of traditional perspective. That is why the G-normalization procedure is unlikely to find wide practical application in the near future. However, as the saying goes, «every cloud has a silver lining». While the problem of G-hyperbolism effect's existence and the necessity of G-normalization procedure application to eliminate its influence is not fully realized (and this is unlikely to happen in less than a year), the G-hyperbolism effect can be used by those who have already realized its usefulness for achieving their own economic interests.

For the possibilities of targeted G-hyperbolism effect application to be revealed, we settle the statement that can be formulated on the basis of earlier results [3, www.galasyuk.com].

The usage of exclusively relative figures to define processes and objects, including economic ones as well, can distort their evaluation.

Let us apply this statement to specific economic situations and analyze the possibility of its usage for achieving certain economic goals.

Let us consider the first example. According to public financial reports, revenue growth rate for Nvidia company made 186.39% in 2001. It was higher than the revenue growth rate of Wal-Mart Stores by 70.5%. At the same time, Wal-Mart Stores remains a number-one company not only in the USA, but also worldwide, keeping the lead on the «Global 500» and «Fortune 500» lists of the

Fortune magazine. Nvidia appeared to be the first on the «100 Fastest Growing» list of this authoritative edition. However, is it possible to compare the growth rates of the «giant» and the «dwarf»: revenues of Wal-Mart Stores increased from $165 013 million to $191 329 million, that is more than by $26 million, while the revenues of Nvidia increased from $735 million to $1 370 million, that is, by only $635 million.

Taking into account the fact that the conditions for eliminating G-hyperbolism effect's influence was not kept when calculating the rates of revenues growth for both Nvidia and Wal-Mart Stores, we can conclude that these revenues growth rates were distorted under the influence of G-hyperbolism effect. Along with that, the G-hyperbolism effect turned the evaluation of revenues growth rates for Wal-Mart Stores and Nvidia in favour of the latter.

Let us compare now the relative values of revenues dynamics for Nvidia and Wal-Mart Stores without application of G-normalization procedure.

The comparison of relative values of revenues dynamics for Nvidia and Wal-Mart Stores without using G-normalization procedure demonstrates that the rate of revenues growth of Nvidia is higher than that of Wal-Mart Stores:

$$I_{Nvidia} = \frac{1370 \text{ billion dollars}}{735 \text{ billion dollars}} = 1{,}8639 >$$

$$> I_{Wal\text{-}Mart\ Stores} = \frac{191329 \text{ billion dollars}}{165013 \text{ billion dollars}} = 1{,}1595.$$

The comparison of relative values of revenues dynamics of Nvidia and Wal-Mart Stores with G-normalization procedure demonstrates that the G-index[1] of revenues growth for Wal-Mart Stores is higher than the G-index of revenues growth for Nvidia:

$$I^G_{Nvidia} = \frac{1370 - 735 + 1}{735 - 735 + 1} = \frac{636}{1} = 636 <$$

$$< I^G_{Wal\text{-}Mart\ Stores} = \frac{191329 - 165013 + 1}{165013 - 165013 + 1} = \frac{26317}{1} = 26317.$$

Thus, the comparisons of relative values of revenues dynamics of Nvidia and Wal-Mart Stores with and without application of G-normalization procedure demonstrate opposite results. At that, in our opinion, the result of comparison based on G-normalization procedure is trustworthy as it was not influenced by G-hyperbolism effect. Thus, in 2001, the dynamics of revenues growth of Wal-Mart Stores was higher than that of Nvidia.

The understanding of the statement brought forth at the beginning of the article gives an opportunity to unveil the reasons for inexplicably high growth rates of developing economies. At the same time, the rates of economic growth

[1] G-index – index derived from application of G-normalization procedure to traditional index.

of the developed countries seem to be rather modest. However, the G-hyperbolism effect provides for reconsideration. Let us consider a simple example. In the 1st Quarter of 2002, the growth rate of Kazakhstan's GDP was 10.7% per annum. At the same time, the same index for the USA made 5.8%, having exceeded the most optimistic expert expectations (worth reminding is the fact that in QIV, 2001, the GDP of the USA increased by only 1.4% per year). Thus, Kazakhstan outperformed the USA in terms of GDP growth rate. However, in 2001, the GDP of Kazakhstan was $21.6 billion, while the GDP of the USA was $9 340 billion. Therefore, the US GDP growth rate of 5.8% per year turns into a $541.7 billion increase, whereas Kazakhstan's GDP growth rate of 10.7% per year means a GDP increase of only $2.31 billion. In other words, if we made a fantastic assumption that the US economy stopped in development and Kazakhstan kept the same GDP growth rate, then, *ceteris paribus*, Kazakhstan would need nearly 60 years to «catch up» with the USA.

Taking into account the fact that the conditions of eliminating G-hyperbolism effect were not obeyed when estimating the GDP growth rates of both Kazakhstan and the USA, we can conclude that the given GDP growth rates were distorted by G-hyperbolism effect. Moreover, the influence of G-hyperbolism effect on GDP growth rates of Kazakhstan and the USA favoured Kazakhstan.

Let us compare the relative values of GDP dynamics of Kazakhstan and the USA with and without application of G-normalization procedure.

The relative value of GDP dynamics of Kazakhstan is higher than that of the USA if the comparison is conducted without using the G-normalization procedure:

$$I_{Kazakhstan} \frac{23{,}91\,\text{billion dollars}}{21{,}6\,\text{billion dollars}} = 1{,}107 > I_{USA} = \frac{9881\,\text{billion dollars}}{9340\,\text{billion dollars}} = 1{,}058.$$

When applying the G-normalization procedure, however, the dynamics of the US GDP growth rate turns out to outperform that of Kazakhstan:

$$I^{G}_{Kazakhstan} = \frac{23{,}91 - 21{,}6 + 1}{21{,}6 - 21{,}6 + 1} = \frac{3{,}31}{1} = 3{,}31 < I^{G}_{USA} = \frac{9881 - 9340 + 1}{9340 - 9340 + 1} = \frac{542}{1} = 542..$$

Thus, the comparison of relative values of GDP dynamics indices of Kazakhstan and the USA demonstrates opposite results, depending on whether or not the G-normalization procedure was used. In our opinion, the result of comparison with application of G-normalization procedure is trustworthy as it was not distorted by the influence of G-hyperbolism effect. Thus, the actual GDP growth dynamics of the USA outperformed that of Kazakhstan in QI, 2002.

Understanding the G-hyperbolism effect's influence is the key to understanding of the discrepancy in growth rates of income and revenues, income and cost prices, etc. When calculating growth rates of all the indices mentioned above, the G-hyperbolism effect's influence may take on different forms. Knowing this allows to discover that, in some cases, the stakeholders' criticism of managers because of the rate of decrease in profit being much higher than the rate of decrease in income, is absolutely groundless. Such situations are not so often the result of ineffective management as of G-hyperbolism effect.

The above-mentioned allows making three very important practical conclusions:

1. Be careful with the received information which is based on comparison of relative indices of different processes since they might be influenced by G-hyperbolism effect.

2. Try to get access to initial data used to calculate relative indices and use G-normalization procedure to eliminate G-hyperbolism effect.

3. Generate and distribute information based on comparison of relative indices of dynamics of various processes if its inclination to be affected by G-hyperbolism meets your interests. Conceal knowledge of the existence of G-hyperbolism.

Worth noting is the fact that smart business leaders are already aware of G-hyperbolism existence. For instance, as the president of famous corporation INKOM Alexander Kardakov notes: «It's notable that most of the Ukrainian companies working in IT and telecommunications do not publish the results of their activity in absolute numbers, i.e. they conceal their turnover and profit. If a company is successful, they talk about it without reservation. If not, – they start creating some «indicators of growing popularity» of their trade mark, certain «relative growth indicators»... As for us, we simply inform that we have made $21 million just on telecommunication solutions. Because we have really made them» [4].

To develop an application tool, we have constructed a «G-hyperbolic leverage» model. It allows to use the G-hyperbolism effect as best as we can in specific situations. The main point of this model is in selecting a more effective option of achieving the target value of relative index taking into account the influence of G-hyperbolism effect.

In economics, G-hyperbolic leverage model is the analogue of the tool used by the ancients to achieve maximum results with minimum efforts and later called «leverage». The specialists of COWPERWOOD Consulting Group have already applied G-hyperbolic leverage model. Below you will find a basic version of G-hyperbolic leverage model.

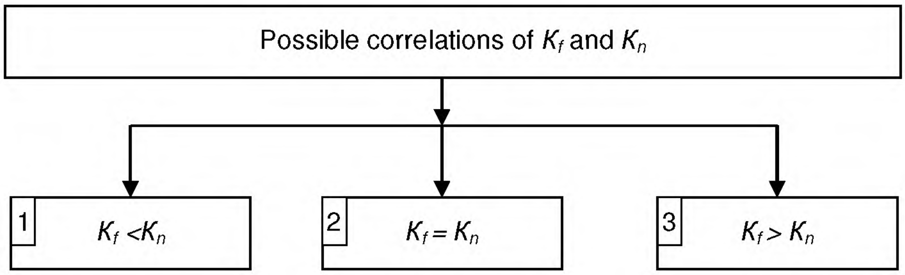
Two quantities m and n are compared using the comparison criterion $\frac{X}{Y}$. Their ratio determines the actual value of comparison criterion K_f:

$$K_f = \frac{m}{n}. \qquad (12)$$

Assume that we need to achieve the equality of the real value of comparison criterion K_f of certain target value K_n. At the same time, it is necessary to take into account that there are three probable correlations of K_f and K_n (Figure 4).

Figure 4.

Possible Correlations of K_f and K_n



1) If $K_f < K_n$, it is necessary to increase K_f that can be achieved by increasing *m* or by decreasing *n*, or by simultaneous realization of both procedures (Figure 5). At the same time, the first and the third ways shown on Figure 5 are evidently the special cases of the second way.

2) If $K_f = K_n$, no additional changes of K_f are needed.

3) If $K_f > K_n$, it is necessary to decrease K_f, which can be achieved by decreasing *m* or by increasing *n* or by simultaneous realization of the both procedures (Figure 6). At the same time, the first and the second ways shown in Figure 6 are evidently the specific cases of the second one.

It is essential that none of these ways of achieving equality of actual value of comparison criterion K_f and its target value K_n can be preferred in all situations.

Depending on specific conditions, each of the ways may appear to be the most effective. Usually, the most effective way of achieving equality of K_f and K_n can be considered the one which allows to achieve equality of K_f and K_n with minimal changes in parameters *m* and *n* by using the G-hyperbolism effect.

Figure 5.

Ways of Bringing Actual Value of Comparison Criterion K_f to Its Target Value K_n ($K_f < K_n$)

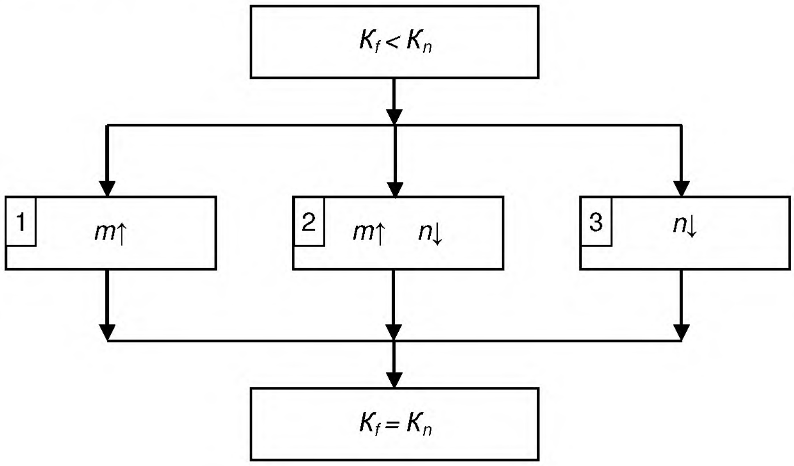
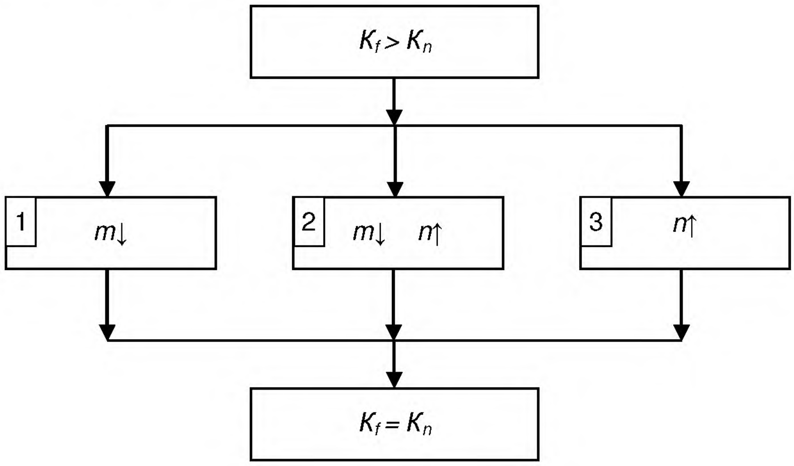


Figure 6.

Ways of Bringing Actual Value of Comparison Criterion K_f to Its Target Value K_n ($K_f > K_n$)



The mechanism of achieving the equality of K_f and K_n can be expressed most generally with the following formula:

$$K_n = \frac{m + \Delta m}{n + \Delta n}. \tag{13}$$

Values Δm and Δn can be both positive and negative in this formula.

In view of the aforementioned, the task of selecting the most effective way of achieving the equality of K_f and K_n can be brought to the optimization task, where $f = |\Delta m| + |\Delta n|$ is a criterion, and equality $K_f = K_n$ is a restriction.

$$f = (|\Delta m| + |\Delta n|) \to \min, \ K_f = K_n. \tag{14}$$

Solving this optimization task allows to find values of Δm and Δn which provide for the most effective way of achieving the equality of K_f and K_n in a specific situation.

The graph of dependence of K_f from m and n demonstrates the inequality of different ways of achieving equality of K_f and K_n in specific situations (Figure 7). The same change in K_f can be achieved by essentially different changes in m and n.

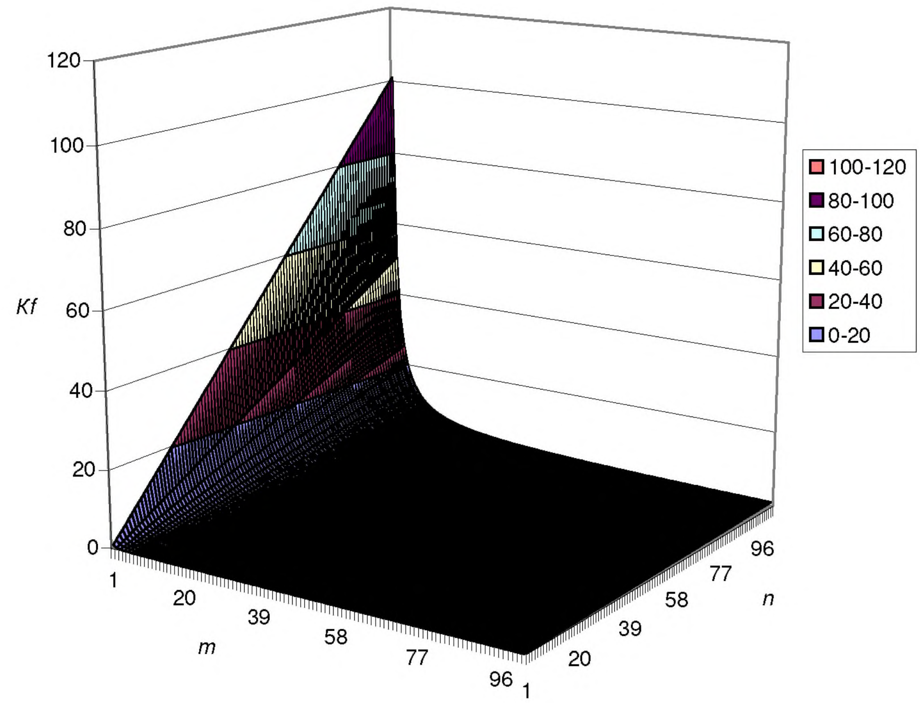
The task of selecting the most effective way of achieving equality of K_f and K_n is similar to some extent to the traveller's task of achieving the given height with a minimal number of steps. Assuming that Figure 7 represents a landscape, the direction chosen by the traveller to achieve the height will determine the quantity of steps he needs to make in order to achieve it. As it can be seen from Figure 7, the traveller's step in one direction can lead him to the height which could not have been achieved had he made a hundred of steps in any other direction. In economics such steps are monetary units.

The G-hyperbolic leverage model can be applied to solve various economic tasks. For example, the following classic economic question can be answered by using this model: what is better, «to earn more» or «to spend less» in a specific situation in order to achieve a given efficiency level, which is determined as the results/costs ratio.

The G-hyperbolic leverage model can be applied also in the field of traditional financial analysis based on financial coefficients. Let us give an example of such a G-hyperbolic leverage model application. Assume that it is necessary to achieve the equality of current liquidity coefficient, which is determined as the ratio of current assets to current liabilities, with a certain target value, for instance 2 ($K_n = 2$). The actual value of current liquidity coefficient is 0.76 ($K_f = 0.76$) when the value of current assets is UAH 2 300 000 (m = 2 300 000) and the value of current liabilities is UAH 3 000 000 (n = 3 000 000).

Figure 7.

Dependence *Kf* from *m* and *n* for *m* [1; 100] and *n* [1; 100]



Having solved the optimization task[2] which is expressed as (14), we get $\Delta m = 0$, $\Delta n = -1850000$. Thus, the most effective way to achieve the target value of the coefficient of current liquidity is to decrease the value of current liabilities by UAH 1 850 000. We would like to acknowledge that for the coefficient of current liabilities to achieve its target value of 2 ($K_n = 2$) only through increase in current assets, an enterprise would have to increase its current assets by UAH 3 700 000.

In reality, these tasks are more complicated and systemic. To simplify their solution, the specialists from COWPERWOOD Consulting Group are developing an automated system of financial indices optimization (ASFIO-1) that will be available in Internet within the «Quick Decision» project.

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[2] This type of tasks can be solved by using «Solution Search» application of Microsof Excel.

Thus, in this research we have revealed the G-hyperbolism effect in different economic situations and demonstrated the mechanism of its elimination by using the G-normalization procedure. Besides, we have developed the G-hyperbolic leverage model which provided an opportunity to use G-hyperbolism effect in order to achieve certain economic goals.

The G2B Theorem of Business Value Growth Rate with Allowance for G-hyperbolism Effect

The aforementioned proof of the G2 and G2B Theorems was made on the basis of the $\frac{X}{Y}$-type criterion. But as shown in previous publications, it was influenced by G-hyperbolism effect [www.galasyuk.com].

Let us compare now the coefficients k_A and k_B which reflect the expected rates of changes in momentary values of businesses A and B on the basis of $X-Y$ criterion:

$$k_B - k_A = \frac{M_B \cdot (e-1)}{\Delta t} - \frac{M_A \cdot (e-1)}{\Delta t} = \frac{(M_B - M_A)\cdot(e-1)}{\Delta t}. \tag{15}$$

The G2B Theorem will be proved on the basis of $X-Y$ criterion if it is proved that $k_B > k_A$, i. e. $(k_B - k_A) > 0$, given that the momentary value of business B (M_B) is higher than the momentary value of business A (M_A), i. e. $M_B > M_A$, and the coefficients which reflect expectations of changes in businesses A and B are equal $e_A = e_B = e$.

Taking into account (15), the condition when the G2B Theorem is true can be presented in the following way:

$$\frac{(M_B - M_A)\cdot(e-1)}{\Delta t} > 0. \tag{16}$$

Preceding from the fact that t can only be positive ($t > 0$), the inequality (16) will be true only when the numerator is positive:

$$(M_B - M_A)\cdot(e-1) > 0. \tag{17}$$

Inequality (17) is true in two situations:

when both multipliers are positive:

$$\begin{cases} M_B - M_A > 0, \\ e - 1 > 0; \end{cases} \quad (18)$$

when multipliers are negative:

$$\begin{cases} M_B - M_A < 0, \\ e - 1 < 0. \end{cases} \quad (19)$$

After simple mathematical transformations, the systems of inequalities (18) and (19) will look in the following way:

1) both multipliers are positive:

$$\begin{cases} M_B > M_A, \\ e > 1; \end{cases} \quad (20)$$

2) both multipliers are negative:

$$\begin{cases} M_B < M_A, \\ e < 1. \end{cases} \quad (21)$$

The system of inequalities (21), which describes the situation when two multipliers are negative, conflicts with the initial condition that $M_B > M_A$.

Hence, only (20) determines the conditions when the G2B Theorem is true. The execution of the first inequality in (20), which describes the situation when both of the multipliers are positive, is derived from the condition of the G2B Theorem. Then, for the G2B Theorem to be proved, the coefficient which reflects expectations of changes in the momentary value of a business must exceed 1.

As a result of using $X - Y$ criterion to prove the G2B Theorem, we make the conclusion that the G2B Theorem is true only in the cases when the coefficient which reflects expectations of changes in momentary values of businesses A and B are greater than 1: $e > 1$.

Thus, in the result of using two different types of criteria $X - Y$ and $\frac{X}{Y}$ of comparison for proving the G2B Theorem, two non-identical conclusions were made about the G2B Theorem's incidence.

Which conclusion about the incidence of the G2B Theorem is true?

To answer this question, we will apply the G-normalization procedure that allows to eliminate the G-hyperbolism effect. The G-normalization procedure allows to arrive at a standard model of numerical comparison of two quantities on the basis of $\frac{X}{Y}$ criterion [www.galasyuk.com].

Analytically, the G-normalization procedure can be shown as:

$$\frac{X}{Y} = X - Y + 1. \tag{22}$$

Let us prove the G2B Theorem by using the G-normalization procedure. We will make a comparison of coefficients k_B и k_A, which reflect the expected rates of changes in the momentary values of businesses A and B. In the result of applying the G-normalization procedure to compare these two quantities, we will receive:

$$\frac{k_B}{k_A} = k_B - k_A + 1 = \frac{M_B \cdot (e_Б - 1)}{\Delta t} - \frac{M_A \cdot (e_A - 1)}{\Delta t} + 1. \tag{23}$$

Since $e_A = e_B = e$, (23) will take on the following form:

$$\frac{k_B}{k_A} = k_B - k_A + 1 = \frac{M_B \cdot (e-1)}{\Delta t} - \frac{M_A \cdot (e-1)}{\Delta t} + 1 = \frac{(M_B - M_A) \cdot (e-1)}{\Delta t} + 1. \tag{24}$$

As it was said above, for the G2B Theorem to be proved, it is necessary to prove that $k_B > k_A$, i. e. $k_B / k_A > 1$. So, the following inequality must be true:

$$\frac{(M_B - M_A) \cdot (e-1)}{\Delta t} + 1 > 1. \tag{25}$$

In the result of simple transformations, (25) will take on the following form:

$$\frac{(M_B - M_A) \cdot (e-1)}{\Delta t} > 0. \tag{26}$$

Similar inequality was considered when proving the G2B Theorem on the basis of the $X - Y$ -type criterion. In the result of solving this inequality, we arrive at the conclusion that the G2B Theorem is true only when $e>1$.

Thus, having applied the G-normalization procedure, we made the conclusion about the incidence of the G2B Theorem, which was equal to the conclusion that we have received as a result of proving the G2B Theorem on the basis of $X - Y$ -type criterion: The G2B Theorem is only true when the coefficient that reflects expectations of changes in momentary values of business *A* and business *B* exceed 1, i. e. $e > 1$.

Let us investigate what kind of expected changes in momentary value of a business is characterized by $e>1$.

As it was noted above, the coefficient e_i that reflects expectations at the point of time t_i about changes in the momentary value of a business at certain time in the future, can be calculated as follows:

$$e_i = \frac{M_{i+1}}{M_i}, \qquad (27)$$

where:

M_i – momentary value of a business at time t_i;

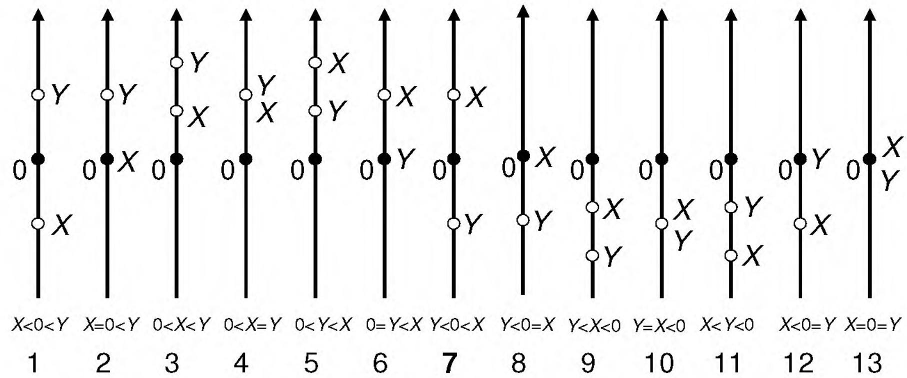
M_{i+1} – expected momentary value of a business at time t_{i+1} in the future

Let us research all possible values of e_i.

According to «Galasyuk beads», only 13 qualitatively different alternatives of the correlation of two quantities on the numerical axis are possible (Figure 8) [www.galasyuk.com][3]:

Figure 8.

«Galasyuk Beads»



On the basis of «Galasyuk beads», let us construct Table 1, which presents values of e_i for different correlations of M_i and M_{i+1} on the numerical axis.

It can be seen from Table 1 that there are only two correlations of M_i and M_{i+1} that are characterized by $e > 1$:

1) $0 < M_i < M_{i+1}$;

2) $M_{i+1} < M_i < 0$.

[3] Fixed by Valeriy Galasyuk.

Table 1.

Values of e_i for Different Correlations of M_i and M_{i+1} on the Numerical Axis

Correlation of M_i and M_{i+1} on the Numerical Axis	$M_i = 0 < M_{i+1}$	$0 < M_i < M_{i+1}$	$0 < M_i = M_{i+1}$	$0 < M_{i+1} < M_i$	$0 = M_{i+1} < M_i$	$M_{i+1} < 0 < M_i$	$M_{i+1} < M_i = 0$	$M_{i+1} < M_i < 0$	$M_{i+1} = M_i < 0$	$M_i < M_{i+1} < 0$	$M_i < 0 = M_{i+1}$	$M_i < 0 < M_{i+1}$	$M_i = 0 = M_{i+1}$
Value of e_i	not determined	$e_i > 1$	$e_i = 1$	$0 < e_i < 1$	$e_i = 0$	$e_i < 0$	not determined	$e_i > 1$	$e_i = 1$	$0 < e_i < 1$	$e_i = 0$	$e_i < 0$	not determined

The first correlation characterizes the case of the expected growth in positive momentary value M_i of a business.

The second correlation characterizes the case of the expected fall in negative momentary value M_i of a business.

Thus, in theory, we could state that the G2B Theorem is true for both the case of growing positive momentary value M_i and the case of falling negative momentary value M_i. However, in practice, it is not expedient to regard the object that has negative momentary value M_i at the moment of appraisal, under condition that its value is expected to fall in the future, as a business.

Hence, for the G2B Theorem to be true, the only essential change in the value of a business is when the positive momentary value M_i of a business is growing.

In view of this, the G2B Theorem must be treated not as a theorem of the rate of business value change but as a theorem of the rate of business value growth.

G2B Theorem. ***Under equal coefficients reflecting expectations of growth of the business momentary value at a certain period of time in the future, the business with higher momentary value has higher expected rate of momentary value growth.***

For any other object, the theorem about the rate of growth of the object's value can be formulated as follows.

Theorem G2. ***Under equal coefficients reflecting expectations of growth of the object's momentary value at a certain period of time in the future, the object with higher momentary value has higher expected rate of momentary value growth.***

Thus, in this research we have demonstrated that «higher value grows faster». This may become one of the fundamental economic principles of centralization and concentration of capital that predetermines the inevitability of further development of globalization processes.

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