Changing of Macroeconomics under Influence by Internal and External Powers

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Abstract—This paper shows that the economy of any country can be presented as three different shells such as: economic shell of a big, a medium and a small business. The new concepts were introduced such as: volume of an economic shell, coefficient of shell's expansion (compression) etc. These shells can expansion or compress under action by internal or external powers and when shell expansions – it means the rising of a business activity and compression shows us that economy goes on recession. This process of an expansion or a compression can develop in the various ways like linear, logarithm or any other mathematical laws.

Keywords—Different kinds of deformation of macroeconomics' shells, shells of a big or a medium and a small business.

I. Kinds of Deformation of the Economic Shells for Different Types of the Economics

WHEN internal or external powers (or their joint influence) influence on the economic shells they begin deforming.

Concurrently expansion or compression of the economic shells (or their joint expansion and compression) mean that they can be as proportionally, i.e. using the same mathematical law, and in percentage terms size and they can be so not proportionally, i.e. using the different mathematical laws and on the different, in percentage terms, size.

Complex deformation of an economic shell is understood as deformation, when the simultaneous influence by internal and external powers enclosed in the different areas. Thus, in one or several areas of an economic shell can expansion under influence by internal powers or compress under influence by external powers on it. Hence the internal and the external powers influence on a shell can be both identical and different in size too.

As the powers P_V influence on an economic shell can differ in a relative size, so we will give them the following three gradations:
- P_b is a big internal (external) power;
- P_m is a medium internal (external) power;
- P_s is a small internal (external) power.

Let us accept the meaning of power P_V as a mathematical sign "−" for the external powers which compress an economic shell and it is deformed so that its volume miniaturizes. If the internal powers influence on an economic shell so we can consider that it is as a positive, i.e. as a mathematical character "+". So the economic shell deforms in this case and its volume increases. We will not use the mathematical character "+" in the further.

Economy shells can have the different kinds of changing under influence by internal and external powers P_V.

Now we will give the following definitions for all three powers [1]-[4], [7]-[9], [12] [13]:
- *A big internal (external) power P_b is such a power, which influences on the economic shell so strongly that after this deformation it has as minimum a crack;*
- *A medium internal (external) power P_m is such the power, which influences on the economic shell so that after this deformation it has no cracks;*
- *A small internal (external) power P_s is such the power, which influences on the economic shell so that after it the deformation is not significant.*
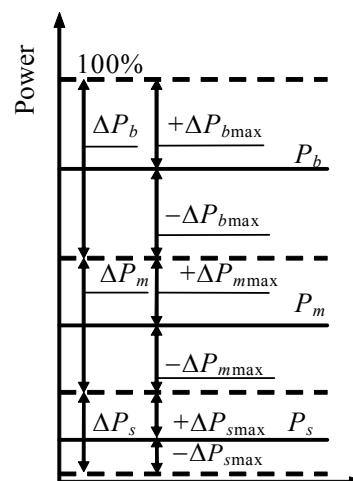

Fig. 1 Distribution of the powers of a deformation P_V of the economic shells

Fig. 1 shows the kinds of a power of a deformation P_V on an economic shell. Thus we can write:

$$\Delta P_b = +\Delta P_{b\,\max} + \left| -\Delta P_{b\,\max} \right|, \tag{1}$$

$$\Delta P_m = +\Delta P_{m\,\max} + \left| -\Delta P_{m\,\max} \right|, \tag{2}$$

$$\Delta P_s = +\Delta P_{s\,\max} + \left| -\Delta P_{s\,\max} \right|, \tag{3}$$

where:

ΔP_i is the size of a power of an impact P_V on an economic shell; $+\Delta P_{\max}$ is the maximal deviation from size of a power of an impact P_V on an economic shell in the direction of increasing; $-\Delta P_{\max}$ is the maximal deviation from size of a power of an impact P_V on an economic shell in the direction of reduction.

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Thus, the size of a deformation's power P_V on an economic shell can be presented by the following formula (4) [11]

$$P = \Delta P_b + \Delta P_m + \Delta P_s = +\Delta P_{b\max} + \left|-\Delta P_{b\max}\right| + $$
$$(+\Delta P_{m\max}) + \left|-\Delta P_{m\max}\right| + (+\Delta P_{sma}) + \left|-\Delta P_{s\max}\right| = 100\%. \quad (4)$$

It is necessary to note here, that the meanings ΔP_b is more than the meaning ΔP_m and more many times than ΔP_s, i.e. $\Delta P_b > \Delta P_m$, $\Delta P_h \gg \Delta P_s$ and thus the meanings ΔP_b should change much less in time, than ΔP_m, and consequently more than ΔP_s. Otherwise economic system will be not stable and it is expected by economic shocks like a global economic crisis. It is difficult to image, that each month such laws would be issued or took place cataclysms, which would be the result of such conditions of all economic shells [1].

Some kinds of the variants of a changing in the economic shells under influence by internal (external) powers will be described below.
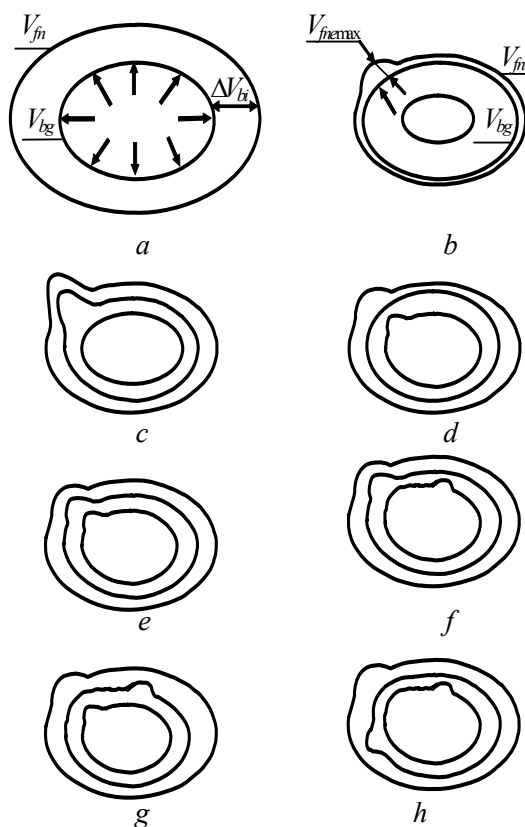

Fig. 2 Kinds of an expansion of the economic shells

a is a proportional expansion of an economic shell; *b* is an expansion of an economic shell in the separate parts; V_{bg} is initial condition of an economic shell, V_{fn} is the final condition of an economic environment, $V_{bne\max}$ is a maximal expansion of an economic shell in the separate parts; *c, d, e, f, g, h* are variants of an economic shell's expansion

II. KINDS OF DEFORMATIONS OF THE ECONOMIC SHELLS

At first let us introduce a characteristic – it is a volume of an economic shell V_e. It will allow us to write the following expressions in our example. Here there is no influence on the economic shells by internal (external) powers

$$V_{bb1} = V_{bb2} =,..., V_{bbn} = const. \quad (5)$$

$$V_{mb1} = V_{mb2} =,..., V_{mbn} = const. \quad (6)$$

$$V_{sb1} = V_{sb2} =,..., V_{sbn} = const. \quad (7)$$

where:
V_{bb} is the volume of the big business'shell;
V_{mb} is the volume of the medium business' shell;
V_{sb} is the volume of the small business'shell.

This condition of the economic shells can be presented by more universal expression

$$V_e = f(t) = const, \quad (8)$$

where:
V_e is a volume of an economic shell; f is a function (mathematical law), on which occurs change of an economic shell's condition; t is time

Whereas any company is characterized by the various parameters such as P_1, P_2, ..., P_n, hence any economic shell can be presented as a many−dimensional anisotropic hyperellipse, which coordinates will correspond to the given parameters above.

For convenience of calculation we will accept an initial volume of each economic shell before influence on them by internal (external) powers equal to 1. It is submitted by formula (9).

$$\frac{P_1}{a^2} + \frac{P_2}{b^2} + \frac{P_3}{a^2} +,...,+ \frac{P_1}{a^2} = 1. \quad (9)$$

Hence, the volume of each economic shell also has to be equal to 1, i.e. $V_{sb} = V_{mb} = V_{bb} = 1$.

A. The First Kind of Deformation when the Volume of Three Economic Shells Expansions

It can be only then, when we have all internal powers (Fig. 2).

In this example we can have three following variants:

- All economic shells expansion to the proportionally previous condition on all axes (Fig. 2*a*);
- All economic shells expansion not to the proportionally previous condition on all axes;
- All economic shells expansion in one or several separate areas (Fig. 2*b, c, d, e*).

There are two economic shells where $V_{bg} = V_{fn}$ in Fig. 2*b*.

Let us examine these expansions separately:

Proportional expansion of all economic shells

It means, that they are influenced in the regular intervals on all surface by identical internal powers. Thus all shells expansion proportionally on any certain percent. Here it is necessary to know that the powers influence on the economic shells in this case, differ, on the size. So it is difficult to present itself that the power influences on the economic shell of small business, will make similar change in the other

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economic shells in percentage parity. There are possible variants of an expansion of a shell are submitted in Fig.2a.

For the description of a condition for the shells we have to introduce such characteristic as a "size" of a relative increase (reduction) ΔV_{eo}, which will be described below. It allows us more really to characterize the condition of economic changes in a shell and make a comparison of its expansion or compression (10)

$$\Delta V_{eo} = \frac{(V_{fn} - V_{bg})}{V_{fn}}; \quad or \; \Delta V_{eo} = \frac{(V_{fn} - V_{bg})}{V_{fn}} 100\%, \quad (10)$$

where:

ΔV_{eo} is the size of the relative change in volume of an economic shell;

V_{bg} is the initial condition of an economic shell's volume before the influence on it by internal (external) powers;

V_{fn} is the final condition of an economic shell's volume under influence on it by internal (external) powers.

The size of the relative change can be as more or less 1 (variant of a shell's compression). This parameter can be also equal to zero (variant of insignificant influence by powers or inertance), i.e. it is possible to write the following limits of an existence ΔV_{eo} (11)

$$0 \ge \Delta V_{eo} \ge 1. \quad (11)$$

Now we introduce the meaning of a difference of a volume of an economic shell ΔV_e, between initial V_{bg} and final V_{fn} conditions, which can be written as the following formula (12) (Fig. 2b)

$$\Delta V_e = V_{fn} - V_{bg}. \quad (12)$$

As the meanings V_{bg} and V_{fn} can be different so the size ΔV_e can be as positive, when the economic shell expansions $V_{fn} > V_{bg}$, (Fig. 4), and negative when the economic shell is compressed $V_{bg} > V_{fn}$ (Fig. 6). It can be also equal to zero $\Delta V_e = 0$ (this case can be when there is no changing in economy shell). Energization of the market – it means the expansion of an economic shell and the compression – it means the situation of crisis.
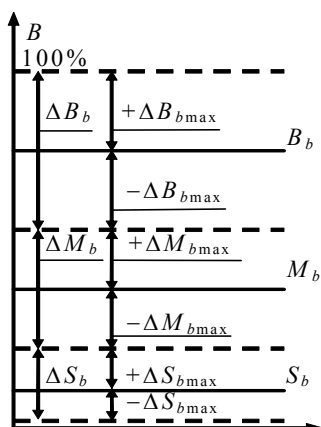

Fig. 3 Distribution of borders of existence of business B

The time during which an economic shell expansions (compressions) Δt_e (Fig. 4d) can be calculated using the formula (13)

$$\Delta t_e = t_{fn} - t_{bg} = (t_{in} - t_{bg}) + (t_{fn} - t_{in}). \quad (13)$$

If we want that all three economic shells expansion (compress) proportionally on identical percent we will introduce the size of an expansion's (compression) coefficient K_{ec}. It characterizes, how much it is necessary to increase (or to decrease) powers influence on the small, the medium or the big business P_{sb}, so that in other shells will be the same proportional changes, for example, $P_{mb} = K_{eci} P_{sb}$, or $P_{bb} = K_{ecj} P_{sb}$.

As in our case the certain quantity of the powers influence on an economic shell, so they can be presented in the following formula (14)

$$P_{sb1} + P_{sb2} +,..., P_{sbn} = \sum_{i=1}^{n} P_{sbi}. \quad (14)$$

As we mentioned above introducing the coefficient K_{exs}, so it is possible to write the universal expression (15)

$$P_{mb1} + P_{mb2} +,..., P_{mbn} = \sum_{i=1}^{n} Pmbi = K_{ec1} P_{sb1} + K_{ec2} P_{sb2} +$$

$$,..., K_{ecn} P_{sbn} = K_{ecn} \sum_{i=1}^{n} Psbi = K_{ec1} P_{bb1} + K_{ec2} P_{bb2} +$$

$$,..., K_{ecn} P_{bbc} = K_{ecn} \sum_{i=1}^{n} bbi. \quad (15)$$

Here we can write the following limits $0 > K_{ec} \gg 1$ for meanings of an expansion's (compression) factor of an economic shell K_{ec}.

The last two formulas were based on the following definition:

Knowing the value of the powers which influence on the economic shells and knowing the value of the factors of an expansion (compression) K_{ec}, for these powers, it is possible to calculate the value of the other economic shells' expansion (compression).

As the economic shells cannot considerably expansion during a short time's interval, so we will introduce concept of the maximal expendable expansion's coefficient K_{ecemax} and time, during which this expansion can take place t_{ecemax}. This time cannot be equal to zero, i.e. $t_{ecemax} \ne 0$. Thus, it is possible to write the size of the disposable final condition of an economic shell's volume under influence on it by internal (external) powers (16)

$$V_{fn} = K_{ece\,max} V_{bg} f(t_{ece\,max}). \quad (16)$$

Using formula (17) we can introduce a size ΔV_{en}, on which the volume of an economic shell can increase (compress) at the maximal expendable expansion (compression) and which can be calculated by the formula (17)

$$\Delta V_{en} = V_{en} - V_{bg}. \quad (17)$$

where:

ΔV_{en} is the volume of an economic shell after the maximal expendable expansion (compression).

For the description of process of expansion (compression) of the economic shells we will introduce concept of the superior and the inferior limits of their existence (Fig. 3). For example, if the economic shell of the small business begins to expansion and it limit reaches the inferior limit of the economic shell of the medium business. Hence, this small business will be already an integral part of the medium business. Fig. 3 shows us how the companies can pass from any economic shell in the other one. Here we have to introduce restrictions on proportional expansion (compression) of any economic shell − any economic shell cannot completely to become the other one and the quantity of the economic shells always must be equal to three.

Using Fig. 3 it is possible to write the expressions for existence of business (18… 20)

$$\Delta B_b = +\Delta B_{b\max} + \left| -\Delta B_{b\max} \right|, \qquad (18)$$

$$\Delta M_b = +\Delta M_{b\max} + \left| -MB_{b\max} \right|, \qquad (19)$$

$$\Delta S_b = +\Delta S_{b\max} + \left| -\Delta S_{b\max} \right|. \qquad (20)$$

Thus, the global business can be presented by the following formula (21)

$$B = \Delta B_b + \Delta M_b + \Delta S_b = (+\Delta B_{b\max}) + \left| -\Delta B_{b\max} \right| +$$
$$+ (+\Delta M_{b\max}) + \left| -\Delta M_{b\max} \right| + (+\Delta S_{b\max}) + \qquad (21)$$
$$+ \left| -\Delta S_{b\max} \right| = 100\%.$$

It is natural that the size B is increased, first of all in view of the fact that population of the Earth is rising, and the second - the ability of the population is increasing of their consumer.

Disproportionate expansion of all economic shells

Under influence by identical internal powers on all three economic shells simultaneously their reaction will be different, hence the volumes of these shells will change differently too. So, for example, after passed a law to support the small business by a state, it is natural, that it will influence considerably on the economic shell of the small business, the changing of the medium business will be less and the big business cannot mention absolutely. In this case should be observed the following equality according to Fig. 3, when the economic shell of the medium business is increased by size ΔM_b ($\Delta M_{b\max}$)

$$S_h + \Delta S_{b\max} \leq M_b + \Delta M_b;$$
$$S_b + \Delta S_{b\max} \leq M_b + \Delta M_{b\max}; \qquad (22)$$
$$S_b + \Delta S_b \leq M_b + \Delta M_{b\max}.$$

The same expression can be written under influence by internal powers on the medium business, when the economic shell of the big business is increased by size ΔB_b ($\Delta B_{b\max}$)

$$M_h + \Delta M_{b\max} \leq B_b + \Delta B_b;$$
$$M_b + \Delta M_{b\max} \leq B_b + \Delta B_{b\max}; \qquad (23)$$
$$M_b + \Delta M_b \leq B_b + \Delta B_{b\max}.$$

The kind of deformation when the economic shells expansion in one or several separate areas

There are some possible variants of such kind of an expansion are shown in Fig. 2b, c, d, e, f. They can be the following:

• One of an economic shell expansions in any area and the others two expansion completely proportionally or disproportionate (Fig. 2b). Using this example we will introduce the size of a maximal deflection of an economic shell $V_{fne\max}$, which shows us how much times this volume can increase, so that it will not cross the upper economic shell. This size is acceptable for the medium and the small business, but does not distributed for the case in Fig. 2c;
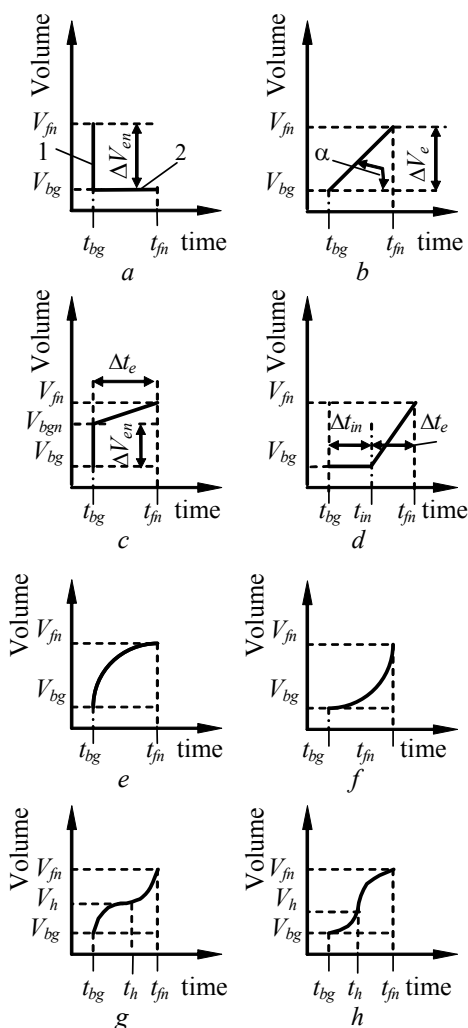

Fig. 4 Variants of an economic shell's expansion

• Two economic shells expansion in the same areas and the third shell expansions proportionally. Under the expansion of the economic shells in the same one area is understood such expansion when the vector of the powers working on the given shells, lies on one line being a perpendicular to the given points. Thus the deformation can occur as on two next shells, i.e. economic shells of the big and the medium business (Fig. 2c) or on the shells of the small and the

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medium business. The deformations of the economic shells can also occur and through a shell, i.e. the economic shells of the small and the big business expansion in the same areas (Fig. 2*d*), while the economic shell of the medium business expansions proportionally. Here can be a variant, when after the deformation on two next economic shells the expansion of the smaller shell will cross the inferior limit of the upper shell (Fig. 2*c*) [1], [3], [4]. Then there is the following question here – if the company is already in a new economic shell, in our example in the big business, or not. So in such kind of the examples in future we will consider company (companies), which has really existed in a new economic shell when they has crossed or join the other economic shell in any area or point of it. In our example a company remains in the medium business. This law is not distributed to the given example, when the economic shell of the medium business after expansion crosses former inferior limit of the big business, so the limits of the big business were displaced in the same area after increasing together with it. This law is distributed to proportional compression too, but not for the small business, especially for the companies where work only one man;

- All three economic shells expansion in the same areas (Fig. 2*e*);
- Two economic shells expansion in the same areas and the third one in the other area (Fig. 2*f*, *g*);
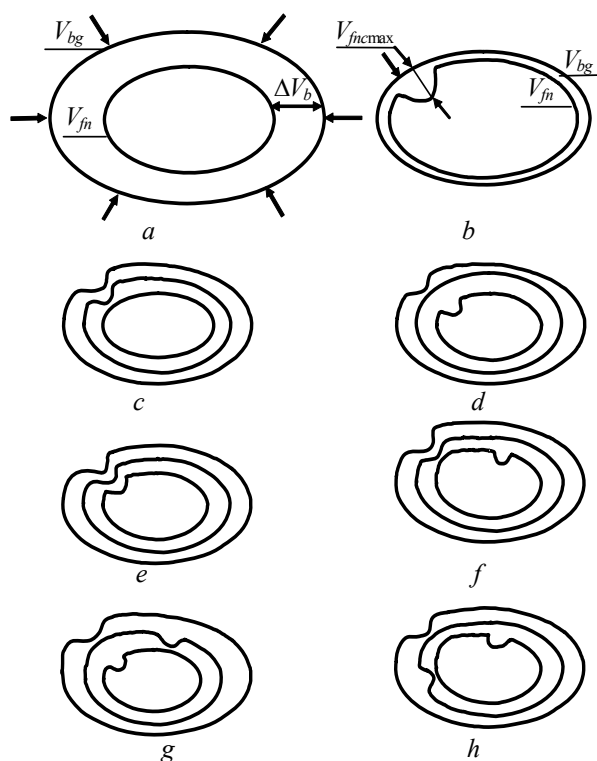- Three economic shells expansion in the different areas (Fig. 2*h*).

Fig. 5 Kinds of the economic shells' compression

a – proportional compression of an economic shell; *b* – compression of an economic shell in the same areas; V_{bg} – initial condition of an economic shell, V_{fn} – final condition of an economic shell, V_{bncmax} –

maximal compression of an economic shell in the separate arear; *c, d, e, f, g* – variants of compression economic shells

Now let us describe the variants of expansion of the economic shells which show in Fig. 4. As we see in Fig. 4 the expansion of the economic shells can be divided into two classes: simple expansion described by linear laws (Fig. 4*a*, *b*, *c*, *d*) and complex expansion described by power, logarithmic, polynomial or the other kind of laws (Fig. 4*e*, *f*, *g*, *h*).

In Fig. 4*a* two variants are shown: line 1 shows us when there is an instant expansion of an economic shell under influence by internal powers. The instant expansion of an economic shell is possible in a case, when the equipment in a company was used only, for example, in 20%. Then the instant rising of production can make 80%, under the condition that the company has necessary details for this purpose. But, as the concept about disposable expansion of an economic shell ΔV_{en}, which was described earlier by the formula (16), the line 1 represents this case (see also Fig. 4*c*). Line 2 is the example when the influence is so small that the volume of an economic shell does not change at all. This variant can be also in the case of an inertance in an economic system. Here, for the description of the submitted lines, it is possible to use the following formulas $V_e = ct$ for the line 1 and $V_e = c$ for the line 2.

As an economic shell will not be able to reach the meaning V_{fn} at once, here can be instant expansion like a "step variant", which combines the instant expansions and the inertance.

The next diagram (Fig. 4*b*) shows the linear dependence, when an economic shell expansions. This variant is preferable at expansion (compression) of an economic shell, as knowing meaning of angle α and time Δt_e, it is easy to calculate the final volume of an economic shell, using the following formula $V_e = t + c$.

Some variants of more complex development of expansion in an economic shell having two lines (see Fig. 4*c*, *d*). So in Fig. 4*c* we can see the case, when under influence by internal powers, the economic shell instantly has reacted to it and it has expansioned on size ΔV_{en} and then its volume changes like the linear law. Fig. 4*d* shows the inertance of an economic shell under influence on it by external powers. The inertance of an economic shell is characterized by time Δt_{in}, during which the volume of an economic shell does not change, despite of influence on it by internal (external) powers (24)

$$\Delta t_{in} = t_{in} - t_{bg}, \qquad (24)$$

where:

t_{in} is the time of the ending inertance of an economic shell.

In our case as the size Δt_{in} more - it means then the more changing of volume in an economic shell will be in future.

The inertance of an economic shell, under influence on it by the powers, shows that the market (companies) estimates changes of their new situation and decides the problems how to react on it.

Thus, here it is possible to make the following definition for inertance of an economic shell.

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The inertance of an economic shell it is such kind of its condition, when under influence on the economic shell by powers P_V its volume V_e does not change during some time Δt_{in} because the market (companies) decides what kind of possible consequences will be in the future after them.

The next class of change of volume in economic shell is shown in Fig. 4 *e, f, g, h* as a curve, which can be described by polynomial (25)

$$V_e = c_1 t_{bg1}^n + c_2 t_{bg2}^{n-1} + c_3 t_{bg3}^{n-2} + \dots + c_i t_{bgi}^{n-i} + c. \qquad (25)$$

Fig. 4*e* is shown the variant, when under influence by internal powers the volume of an economic shell begins increasing quickly and then more slowly to the top of its meaning. Fig. 4*f* shows the same dependence, but only at the beginning, under influence by internal powers, the volume of an economic shell changes slowly, as it has the inertness of system and then changes increase.
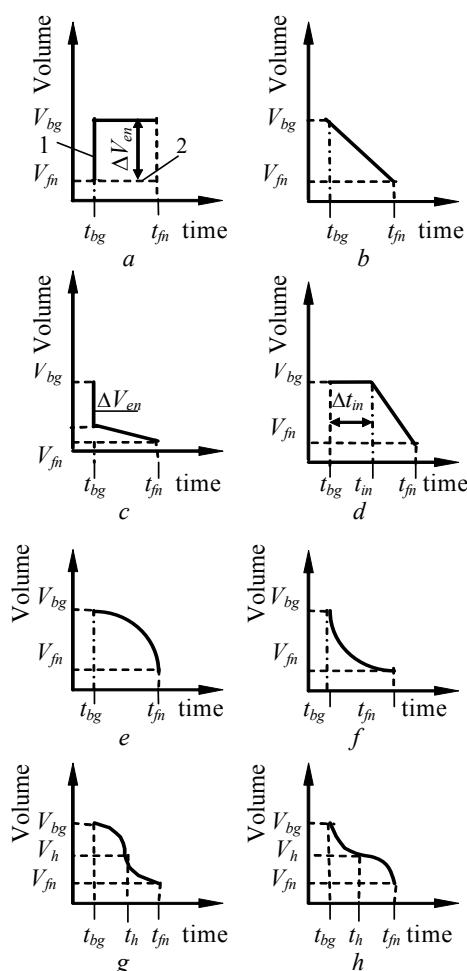

Fig. 6 Variants of an economic shell's compression

In the last two Fig. 4*g, h* are shown practically the same complex dependences of change of a volume in an economic shell. These diagrams have a point of an excess with coordinates V_h and t_h, where one kind of mathematical

dependence of volume of an economic shell is changing on the another one.

B. The Second Kind of Deformation when all Three Economic Shells Compress

In this case all powers working on economic shells are directed outside (Fig. 5).

Three are three following variants can be here:

• All economic shells are compressed to the proportionally previous condition on all axes (Fig. 5*a*);

• All economic shells are compressed not to the proportionally previous condition on all axes;

• All economic shells are compressed in one or several separate areas (Fig. 5*b*).

In Fig. 5*b* two economic shells are represented for presentation, though actually $V_{bg} = V_{fn}$.

Let us examine these compressions separately.

Proportional compression of all economic shells means, that they are influenced in regular intervals on all surface by identical external powers. Thus all shells are compressed proportionally at any certain percent. It is necessary to know here, that the powers working on the shells in this case, differ by their size.
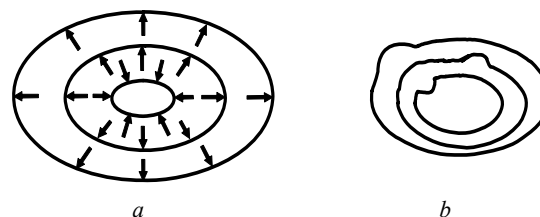

Fig. 7 Kinds of the economic shells' expansion and compression

a – is proportional expansion and compression of the economic shells; *b* – is expansion and compression of the economic shells in separate areas

On the analogy of the description which was made above, we will introduce concept of the maximal expendable compression's coefficient $K_{ecc\,max}$ and period of time, during which this compression can take place $t_{ecc\,max}$.

Thus, it is possible to write the size of the final condition of a volume of an economic shell under influence by external powers on it (26)

$$V_{fn} = K_{ecc\,max} V_{bg} f(t_{ecc\,max}). \qquad (26)$$

If the economic shell under compression moves into the area of other economic shell, it becomes the area of this shell and all laws of this economic shell (Fig. 3) are distributed to it. But it is not distributed to variant in Fig. 6*c*, when the small business "slip" of its inferior limit, it stops the activity, i.e. becomes the bankrupt.

Disproportionate compression of all economic shells. Under influence by identical external powers on all three economic shells simultaneously their reaction will be different; hence, the reduction of volume of these shells will change differently. In this case should be observed the

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following equality according to Fig. 3. Here the economic shell of the big business decreases on size $-\Delta B_b$ ($-\Delta B_{b\max}$)

$$B_b + (-\Delta B_{b\max}) \le M_b + (-\Delta M_b);$$
$$B_b + (-\Delta B_{b\max}) \le M_b + (-\Delta M_{b\max}); \quad (27)$$
$$B_b + (-B_b) \le M_b + (-\Delta M_b).$$

The similar expression can be written under influence by external powers on the medium business when the economic shell of the medium business decreases on size $-\Delta M_b$ ($-\Delta M_{b\max}$)

$$M_b + (-\Delta M_{b\max}) \le S_b + (-\Delta S_b);$$
$$M_b + (-\Delta M_{b\max}) \le S_b + (-\Delta S_{b\max}); \quad (28)$$
$$M_b + (-M_b) \le S_b + (-\Delta S_b).$$

Economic shells are compressed in one or several separate areas. There are some possible variants of such compression are submitted in Fig. 5b, c, d, e, f, h.

They can be the following:

• One economic shell is compressed in any area and the others two ones are compressed completely proportionally or disproportionate (Fig. 5b);

• Two economic shells are compressed in one area and the third shell is compressed proportionally. Under compression of the economic shells in one area is understood such compression when the vector of the power working on the given shells, lies on one line being a perpendicular to the given points. Thus the deformation can occur as on two next shells, i.e. the economic shells of the big and the medium business (Fig. 5c) or on the shells of the small and the medium business. The deformations of the economic shells can also occur and through the shell, i.e. the economic shells of the small and the big business are compressed in the same areas (Fig. 5d), while the economic shell of the medium business is compressed completely;

• All three economic shells are compressed in the same areas (Fig. 5e);

• Two economic shells are compressed in the same areas, and the third one in the other area (Fig. 5f, g);

• Three economic shells are compressed in the different areas (Fig. 5h).

The possible variants of a compression of the economic shells under influence on them by external powers are presented in Fig. 6. They were constructed by analogy of Fig. 4. Here we can represent the similar conclusions too.
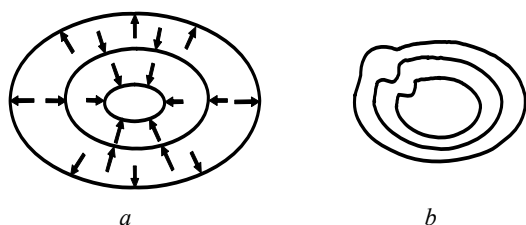

Fig. 8 Kinds of the economic shells' expansion and compression:

a – proportional expansion and compression of the economic shells; b – expansion and compression of the economic shells in separate areas

C. The Third Kind of Deformation when the Shells of the Big and the Medium Business Expansion and the Shell of Small Business Compresses

This example is showed in Fig. 7.

There are following three variants can be here:

• Two economic shells expansion and the last one is compressed to the proportionally by previous condition on all axes (Fig. 7a);

• Two economic shells expansion and the last one is compressed not to the proportionally by previous condition on all axes;

• Two economic shells expansion and the last one are compressed in one or several separate areas (Fig. 7b).

This kind of the economic lattices' deformation, when the big and the medium business expansion, it is possible after some following variants:

• The expansion of the shells of the big and the medium business occur at the expense by absorption of the small business;

• The expansion of the shells of the big and the medium business occur at the expense of the existing negative laws for the small business;

• The expansion of the shells of the big and the medium business occur at the expense of absorption of the small business and existing negative laws for the small business.

For these kinds of deformations we can use the descriptions which were made above for these expansion and compression of the economic shells.
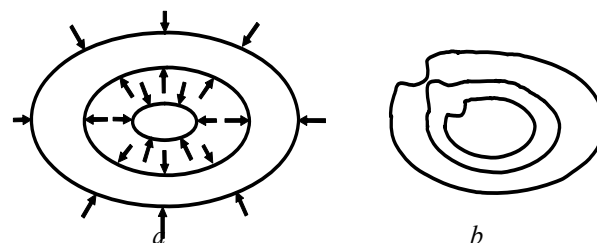

Fig. 9 Kinds of the economic shells' expansion and compression:

a – is proportional expansion and compression of the economic shells; b – is expansion and compression of the economic shells in the separate areas

D. The Fourth Kind of Deformation when the Economic Shell of the Big Business Expansion and the Economic Shells of the Medium and the Small Business Compresses

Here can be the same three variants:

• One economic shell expansions and the other two ones are compressed to the proportionally by previous condition on all axes (Fig. 8a);

• One economic shell expansions and the other two ones are compressed not to the proportionally by previous condition on all axes;

• Two economic shells expansion and the last one is compressed in one or several separate areas (Fig. 8b).

Such kind of a deformation of the economic shells is shown in Fig. 8 and the similar conclusions made are distributed to it above.

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In this case the big business absorbs the medium and the small ones, the result of it will be, first of all, in increase of the prices of the goods and services, which disappear after bankruptcy the medium or the small-sized companies, or after their absorption by the big business.

E. The Fifth Kind of Deformation when the Economic Shells of the Big and the Small Business are Compressed and the Economic Shell of the Medium Business Expansions

Here we can have the following kind of three variants of deformations:

• Two economic shells expansion and the last one is compressed to the proportionally by previous condition on all axes (Fig. 9*a*);

• Two economic shells expansion and the last one is compressed not to the proportionally by previous condition on all axes;

• Two economic shells expansion and the last one is compressed in one or several separate areas (Fig. 9).

This case is shown in Fig. 9*b* where the shell of the big business decreases in one area and the shell of the medium business increase in the same area, gaining for itself the new released markets of selling. When crossing these two economic shells a company (companies) of the medium business is interchanged the position with a company (companies) of the big business. Let us call such process as "rotation" of company and we can give the following definition in this case.

Rotation it is so process when a company increases (decreases) production of goods or service (or both) as the profit of the company can be compared with the lower (higher) border of the other economy shell and it becomes the integral part of this shell.

This definition cannot be used for a company in the small business which decreases production because it can be only bankrupt. If a company from the big business increases production – it means this company can capture a big part of business and it becomes a monopolist. So such kind of company has to divide, as minimum, into two separate companies.

Here it is time to mention that the basis of all description above were the mathematical model of corporation and different kinds of streams which any corporation or company has as inside so outside [5], [6], [10], [14].

III. CONCLUSION

Knowing the powers, which work on an economic shell, it is possible to make various accounts and to define their deformation. Knowing conditions in which any companies work and the deformation of economic shells it is possible to predict, with the certain degree of probability, variants of development of an existence of the companies, i.e. their development or bankruptcy.

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