

## To The New Model of Economic Growth: Neoschumpeterian Evolution Economy

**Abstract.** The paper discussed problem of modeling of economic growth and interpretation models with target by determinacy of economic policy, which stimulate of economic growth. Author presents the model of interaction economic agent: innovators and conservatives in developing schumpeterian model. Using of this method evolutionary viewing of economic growth let us takes for institutional factors development economic system and do new economic policy more efficiency.

**Keywords:** economic growth, innovator, conservator, Schumpeterian development

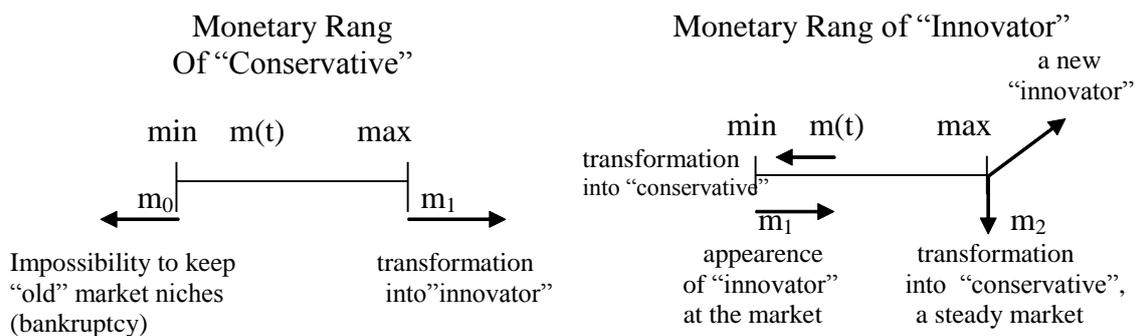
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### 1. «Innovators», «Conservatives» and economic growth: the development of the Schumpeterian model.

In the description of different groups of agents, in particular, of “innovators”, “conservatives”, “unemployed”, the problem of monetary rang within the limits of which an every model of economic behaviour is realized, becomes, as we see it, limited from the point of view of the working out and realization of the arrangements in economic policy.

Among three groups of agents which were named above there is such an interaction which creates economic dynamics and is not discribed by the classical Schumpeterian model. Schumpeter’s idea about “constructive distraction” has a line orientation and comes to the thing that “innovators”, when they appear, take the resources from “conservatives” and make bankrupt the latter. In informative and highly technological economics this effect can not work and “innovators” will appear at the expense of the broadening of some resourses possibilities (because the resource becomes virtual) without causing any appreciable damage to “conservatives”. An important circumstance is that the endogenous fluctuation in the model “innovator-conservative” itself is of great importance for economic development and the hypothesis that this fluctuation depends on the value of the monetary rang in the activity of “innovator” and “conservative” is offered. Hence, in the economic dynamics it becomes important to have a strategy when such a model as “innovator” is switched to “conervative” or “inactive agent” model.

Below we give an evolutionary model of “innovator-conservative-unemployed” within the bounds of the combination of the limits in the monetary rang of different agents. The point where, according to the model, “innovator” transforms into “conservative” and back has an institutional meaning. The parameters of the monetary rang can be dynamically changable values or they cannot change within the limits of some definite time interval (picture 1)



Picture 1- Monetary monetary rang of the system “innovator-conservative”

In the preceding work, which we have just referred to, this model was formulated and scientifically grounded. The next mathematical conception has been obtained:

Where:  $Y(t)$ -gross domestic product

$X(t)$ -index of configuration

$N(t)$ -number of “innovators”

$K(t)$ -number of “conservatives”

$U(t)$ -number of “the unemployed”

$S(t)$ -able-bodied agents

$m(t)$  – the function of money to monetary rang,

$n, k, u$ -correspondingly, the dole of “innovators”, “conservatives”, “the unemployed” in general quantity of “able-bodied” agents.

Now we must broaden the action of the model at the expense of special values and formal connection among them in order to give a complete notion about the evolution of an economic system by means of interaction of agents models-“innovators” and “conservatives”. The model can be included in standard microeconomical schemes (models), if it will only be possible to show the connection of “innovators”, “conservatives” with “the unemployed” category, which appears in the basic models of a labour market and of microeconomical system as a whole. It’s not difficult to find out this connection if we’ll imagine, that “innovators” and “conservatives” are the agents, which fulfil some activities and “the unemployed”, at least from a position of the official statistics of labour, doesn’t fulfil such an activity according to his status.

Under the condition of economic changes and of high world economic dynamics it’s rather narrow task to consider the object of economic development as the minimization of the function of social losses and the maximization of the function of well-being. The reason is that the quality of the development fixes already not the maximum of any showing per head and not minimum of expenses, but how the increase of the profit and of expenses are distributed, how well the agents are adapted and how they take in the changes, structural crises, which appear, not effective management, the changes of institutional connections. In order to get the aims of economic policy it is necessary to have, at least, not less number of the corresponding instruments (Tinbergen’s principle)<sup>1</sup> and the content of economic policy must answer the purpose which it is adapted to (Mandell’s principle of effective market classification)<sup>2</sup>. However, the discussion within the limits of the terms “better-worse” demands to estimate the economic policy additionally, it’s qualitative criterion, because, for example, monetary and fiscal policy as any instruments are not suitable for the solution of structural tasks and institutional problems and can only fulfil an auxiliary role, while getting these objects. During the stage when we choose instruments and realize arrangements, it’s rather problematically to say that exactly this

<sup>1</sup> Tinbergen J. On the Theory of Economic Policy.- Amsterdam, 1952.

<sup>2</sup> Mandell R. The Monetary Dynamics of International Adjustment Under Fixed and Flexible Exchange Rates. – Quarterly Journal of Economics, Vol. LXXIV. – 1960. – P. 249-250.

instrument will allow to achieve the aim because it will only be able to do after the aim had been achieved. Besides, many aims are connected among themselves and it's difficult to share the corresponding instruments, having a wide spectrum of influence, simultaneously aims which can be conflicted. So we consider that the non-admission of appearing of disfunctional in the subject of management and in the objects of a system of influence, which is described by the next parameters: of the aim of development, of the sphere of using of economic policy, of the functional varieties in a system of influence, of the expenses in functioning, and of the realization of the arrangement, of the period of time till the changing of the priority of influence, of the adaption and of the stability in the system to he changes is a necessary and sufficient criterion of realization of the state economic policy. By means of these parameters it's possible to give the level of the coordination in the aspect of realization of definite strategy in the economic policy and of the change in the priority of development.

Let's give a wider interpretation of a model, given above. Let's introduce the next values, characterizing the function of the system (institute).

$R(t)$ -the reserve of an institutional system (institute) in a ready form (monetary form) changing in the limits of some monetary rang of the system;

$I(t)$ -expenses of functioning of institution (system), including transactional ones;

$\sigma=R(t)/I(t)$ -index of liquidity (the reserve of profitability of the system).

$\beta$ -velocity of adaptation of institution (of system).

So we can write down the next model of evolution in the parameters of an institutional system, which is offered by such differential equations:

$$dR/dt = m_2(t) - I(t) \quad (3)$$

$$dI/dt = \beta(R/\sigma - I) \quad (4)$$

The object of realization of such a model can be the next:

1. To describe the dynamic of institution by means of the expenses of their functioning
2. To describe the real departure of the liquidity from some standard.
3. To provide the connection of reserve and the velocity of adaptation of the system (of institution).
4. To give the process of adaptation either monotonous or cyclical.

Having made the necessary substitutions of (3) in (4), we get the equation of reserve changing of the system (institution):

$$\frac{d^2R}{dt^2} + \beta \frac{dR}{dt} + \frac{\beta}{\sigma} R = \frac{dm_2(t)}{dt} + \beta m_2(t)$$

While selecting the function  $m_2$  and taking  $\sigma = \text{const}$ , we can get the solution. If the upper limit of the monetary rang isn't change,  $m_2 = \text{const}$ , then  $dm_2/dt = 0$ , the equation becomes:

$$\frac{d^2R}{dt^2} + \beta \frac{dR}{dt} + \frac{\beta}{\sigma} R = \beta m_2(t)$$

If we give conditions of a very slow adaptation, when the adjustment in the institutional system is performed monotonously without any fluctuation, the coefficient  $\beta = 0$  and so the oscillatory dynamics appears, as it results from the theory of a differential equation, when  $\beta > 4/\sigma$ . In other words, when  $R$  is deflected from its acceptable meanings, which corresponds to a necessary or the most advisable structure of agents (index of configuration), the return of  $R$  to the former meanings, even if we mean clear mathematical logic, will last during the time which is equal to  $\sigma$ .

As the adaptation velocity in the system is scarcely equal to zero and the institutional factors, creating the inertia of a system, the return of  $R$  to the acceptable meanings will require special actions of the government and will not certainly so quick as it can be if we have slow adaptation. Below we give the extensive variant of the model of institutional system with "innovators", "conservatives" and "the unemployed".

$$\left\{ \begin{array}{l} n+k+u=1 \\ \frac{dx}{dt} = f(m(t)) \\ \frac{du}{dt} = -\alpha\left(\frac{dy}{dt} - k_0\right) \\ \frac{dy}{dt} = \tilde{f}(y,t,x) - h(t) \end{array} \right.$$

$$\tilde{f}(y,t,x) = T(t) L_2^a K^b$$

$$h(t) = l(t)y(t) = Z_L$$

$$l = \frac{Z_L}{y}$$

$$\frac{dT}{dt} = l_i y + H(c_1 y, L_1, x, T) - \mu T$$

$$H = C_1 x y L_1^d T^w / (b_1 + c_1 y)$$

$$C_1 = \frac{y}{L_1}, C_2 = \frac{y}{L_2}, L_1 + L_2 = L$$

$$Z_1 = \frac{L_1}{L}, Z_2 = \frac{L_2}{L}$$

$$\frac{dK}{dt} = [1 - C_1 Z_1 - C_2 Z_2] y(t) - \sigma_1(t) K$$

$$\frac{dx}{dt} = \begin{cases} f\left(\frac{R}{m}(t), |x(t)| \leq 1 \right) \\ 0, |x(t)| > 1 \end{cases}$$

$$\frac{du}{dt} = \begin{cases} -\alpha(\tilde{f}(y,T,K) - h(t) - K_0), 0 \leq u \leq \frac{1}{3} \\ 0, 0.2u \notin \left[0, \frac{1}{3}\right] \end{cases}$$

$$\frac{dy}{dt} = e \frac{y}{N+K} + x \frac{y^2}{b_1 L_1 + y^2} L_1^d T^w - \mu T$$

$$\frac{dk}{dt} = \left(1 - 2\frac{y}{L}\right)y - \sigma_1 K, \sigma_1 = 0,2$$

$$\tilde{f}(y, T, K) = T(t)L_2^a K^b$$

$$h(t) = Z_L$$

$$C_1 = \frac{y}{L_1}$$

$$H = C_1 xy L_1^d T^w / (b_1 + c_1 y) = xy^2 L_1^{d-1} T^w / (b_1 + y^2 / L_1) =$$

$$= xy^2 L_1^d T^w / (b_1 L_1 + y^2) = x \frac{y^2}{b_1 L_1 + y^2} L_1^d T^w$$

$$\frac{dk}{dt} = (1 - C_1 Z_1 - C_2 Z_2) y(t) - \sigma_1 K = \left(1 - \frac{y}{L_1} \frac{L_1}{L} - \frac{y}{L_2} \frac{L_2}{L}\right) y - \sigma_1 K =$$

$$= \left(1 - 2 \frac{y}{L}\right) y - \sigma_1 K$$

$$\frac{dy_i}{dt} = f_i(y, t, x) - h_i(t),$$

The function of growth of economic system,

$h_i(t)$ -the function of restructure, it is in proportion to the value of the labour input per unit of output and to the volume output  $h = l_i y_i$ .

$L$ -common employment

$L_{1i} = Z_{1i} L_i$ -workers of mental labour;

$L_{2i} = Z_{2i} L_i$ , -manual workers exclusively

$$Z_{1i} + Z_{2i} = 1.$$

$y_i(t) = T_{1i}(t) L_{2i}^a \cdot K_i^b$  -production function of the system.

$T_i(t)$ -technological function of the system;

$K$ -physical capital of the system (basic funds);

$dK_i/dt$ -describes the process of accumulation of capital in the institutional system;

$c_{1i}, c_{2i}$ -the norms of distribution of aggregate income among the workers of mental and manual labour;

$\sigma_i$ - amortization standard which is fixed in a short space of time.

$dT_i/dt$ -change in technology

$ey_i(t)$ -describes the effects of training in the institutional system;

$H = c_{1i} y_i x L_{1i}^d T_i^w / (b_{1i} + c_{1i} y_i)$ -function, reflected the contribution of workers in the accumulation of technological knowledges,

$\mu_i$ -quantity which characterises the rate of depreciation of knowledges and of earlier technology,

$b_1, d$  and  $w$  ( $d+w=1$ )-not negative parameters;

Parameters and elementary conditions for models:

$$L_1 = 0,4L$$

$$a = 0,3$$

$$x = 0,325$$

$$L_2 = 0,6L$$

$$b = 0,7$$

$$u = 0,1$$

$$\sigma_0 = 1$$

$$b_1 = 1$$

$$y = 6$$

$$\beta = 0,8$$

$$l = 0,01$$

$$T_z = 0,5$$

$$a_0 = -0,4$$

$$\mu = 0,2$$

$$K = 1$$

$$k_0 = 1,2$$

$$d = 0,4$$

$$t = 0$$

$$e = 0,01$$

$$w = 0,6$$

$$L = 65,5 \quad \text{mln. of men}$$

$$\sigma = 0,8$$

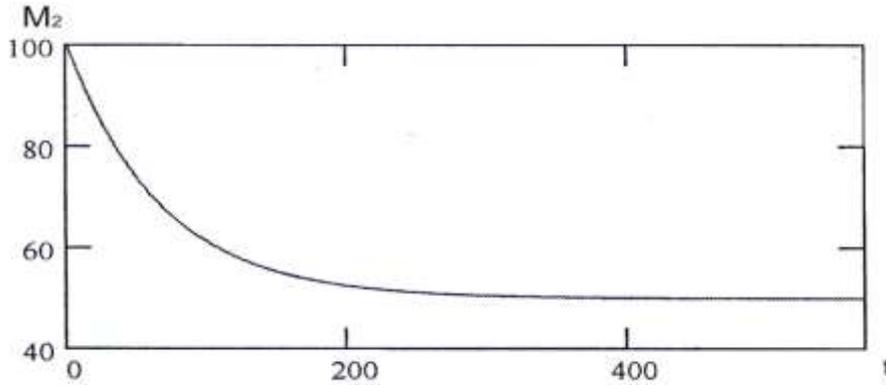
$$\sigma_1 = 0,25$$

$$U = 6,1 \quad \text{mln. of men}$$

As in our model  $m_0=1$ ,  $m_1=2,3$  and  $m_2=4,5$ , the function  $f(x_i, u_i, k_i)$ , after the solution of the corresponding equations, will be:

$$f(x) = \{ \text{sh}(2x-6,8) - (x-1,9)\text{ch}(2x-6,8) \} 0,13 + 0,9$$

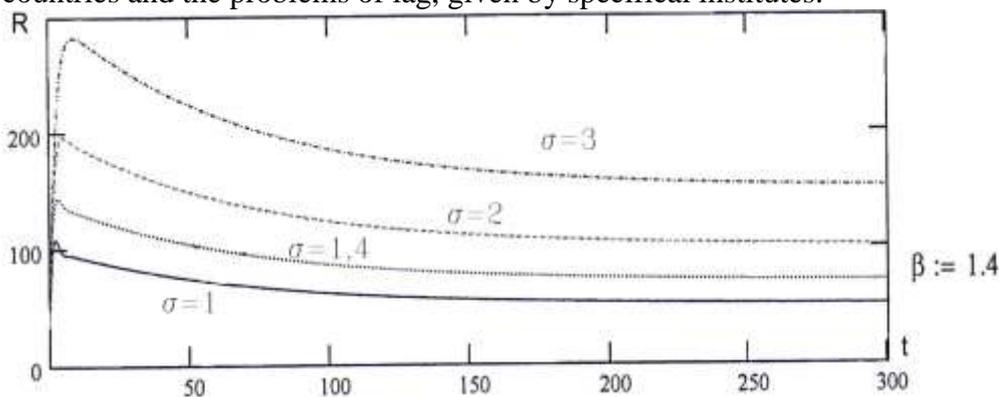
The results of evolutionary model in the given system are submitted to the diagrams.



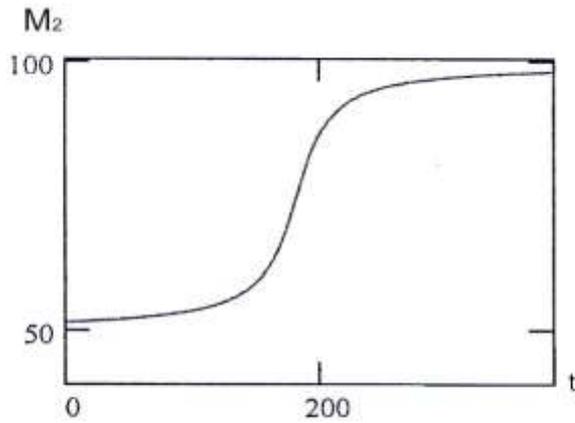
Picture 2. The law of changing of the upper limit in a monetary rang.

It's interesting to note that by the lowering of the upper limit of monetary rang is the reserve size of the institutional system with different meanings of liquid is changed in the same way, in other words it is come down too, and in case of broadening of the upper limit it is increased (picture 2-3, picture 4-5).

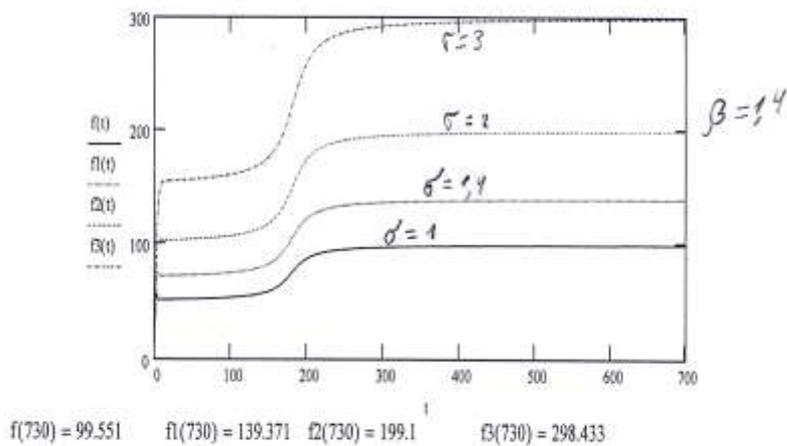
As we can see, our method of approach may be added to the microeconomical models and may be used for the explanation of economic development of economies, where the unemployment and the lag in technology are of great importance. Besides, it may be used when we analyse the problems of innovative-technological development of poor countries (Africa, Latin America and etc.), but this can be rather difficult to do in the modern stage of development of evolutionary economic theory, because it takes a great interest in modelling and so can't take into account, in a necessary volume, the institutional peculiarities in different countries and the problems of lag, given by specific institutes.



Picture 3. The dynamic model of the reserve (R) of an institutional system

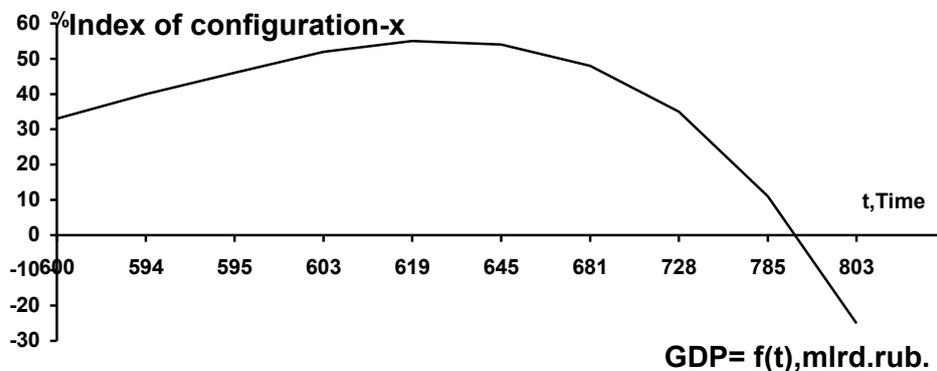


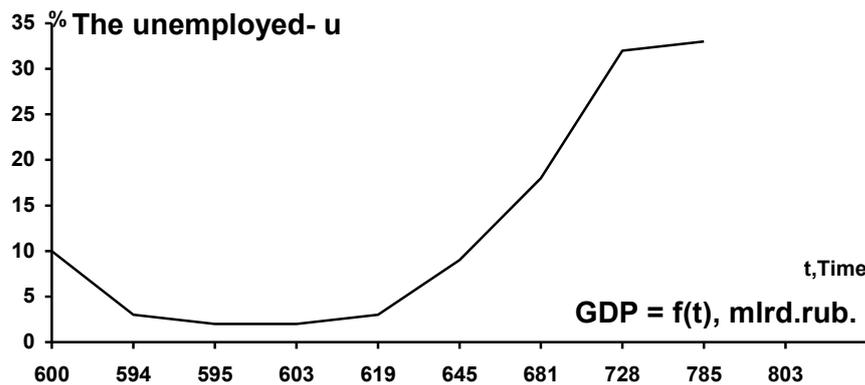
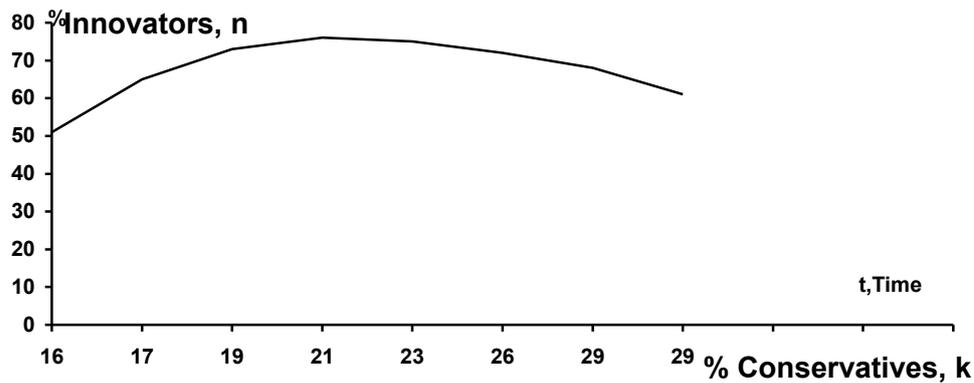
Picture 4. The law of change in the upper limit of monetary rang



Picture 5. The dynamic model of the reserve (R) in institutional system

Below we give the result of the model by the constant quantity in the upper limit of a monetary rang, when the index of the configuration is positive, in other words, “innovators” predominate over and the reserve size sistematically grows. Below two cases are shown: reserve size in its initial point, exceed the limit of transformation of “innovator” into “conservative” and “conservative” into “innovator”  $m_1=2,3$ , and the reserve range in the initial moment is less than this limit meaning.





Picture 6. The result of imitation of the model  $m_2 = 4,5$  (const)

$R = 3,5$  grows to  $M_2$  and more than  $y$  (Gross Domestic) = 645 mlrd. rubles

The analysis of the results of computer imitation, shown on picture 6. (time curve is directed from the left to the right), the solution of the system of differential equations allows to draw some important conclusions.

Firstly, the improvement of index in the configuration of the system, the other words, the increase in manpower of “innovators” over “conservatives” is possible by the lowering of Gross Domestic.

Secondly, the subsequent growth of the institutional system occurs with the worsening of the index of configuration at the expense of growth of the number of “conservatives”. The growth of number of the “conservativees” goes till the index of configuration becomes negative. In this case “conservatives” prevail and the economic growth occurs at the expense of their activity exclusively.

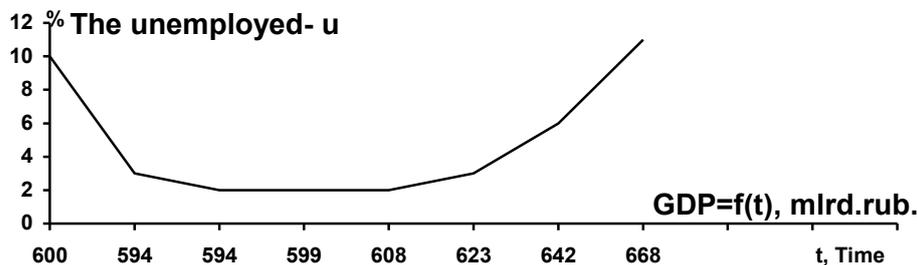
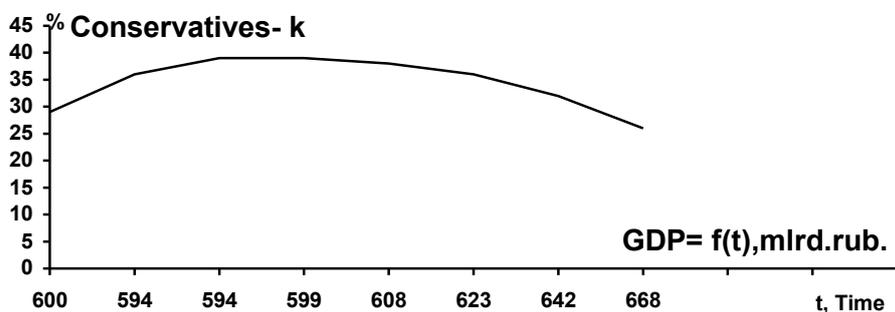
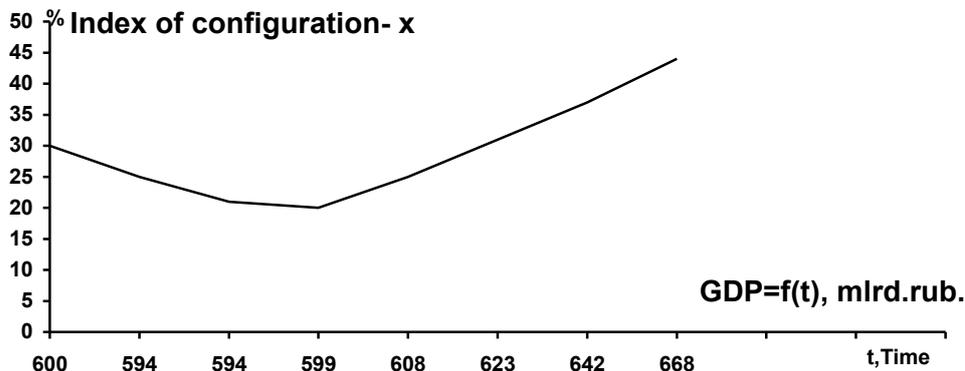
Thirdly, in connection with the fact that the number of “innovators” grows, simultaneously with the growth of “innovators”, we can see the lowering of the level of unemployment.

However, how can we explain such an outcome on condition of the lowering of Gross Domestic?

Nothing remains, but to suppose that the situation which has been got after the realization of this model, corresponds to fact that by the primery prevalence of “innovators” their following increase demands of additional resourses, which are provided by the growth of the reserve of system  $R$ , it is achieved with the growth of conservatives, by means of the cutting down of the unemployed and is expressed by the lowering of the rate of growth or zero growth.

At the same time, the renewal of the economic growth is conditioned by the liquidation of the redundant by number of “innovators” and is expressed by the growth of number of agents the conservative model of behaviour and of the unemployed. So, the growth is in progress by releasing of material resourses and is directed to the conservation of the gained positions, in other words, it confirms by the conservative model of the economic behaviour. The change of

the tendency in dynamics of the index of configuration is observed, when the quantity R of monetary providing (reserve of the system) grows to the upper limit of monetary rang M2 and exceeds it.



Picture 7. The result of imitation of the model with  $m_2 = 4,5$  (const)  $R = 1,5$  grows to  $M_1 = 2,3$  and more, corresponds for  $y$  (Gross Domestic) = 599 mlrd.rub.

On picture 7 the result, when the value of monetary guaranteeing of institutional system is below of point  $m_1$  and grows, is presented. However, till the point of braking the number of “conservatives” will be increased at the expense of the reducing the number of “innovators”, but the unemployment will be appreciably fallen as the increase of number of “conservatives” will exceed the reducing of “innovators” which constantly becomes slower because growing R.

Undoubtedly, the given explanation needs in empirical verification and forms only model interpretation. However, when the model is clear and when the tests are recurring we get the instrument by means of which the evolution of an institutional system in the presence of three pointed groups of agents gets an original filling and it cannot but reflect on the existed effects, connected with the variants of fiscal and credit monetary policy.

A valued conclusion, after the model has been tasted, is to the effect that M. Fridmen’s monetary rule can’t be applied without taking into account the structure of agents, following the showing models of behaviour- innovatory or conservatory. Monetary growth (in our case it is quantity R) can be accompanied by the increasing of an index of configuration at the expense of growing of the number of “conservatives”. For all this the unemployment will come down both

in one and in the other case by some lowering of gross domestic, and then it will grow together with increasing of the tempo of economic growth. In one case the growth occurs at the expense of “innovators”,but in the other case it occurs at the expense of the conservative model of behaviour,though in both these variants “innovators” prevail. If in the start point we take the index of configuration as negative (and it corresponds to the prevalence of “conservatives”), then the situation can be characterized by rather slump of Gross domestic and everything will be determined by other parameters and started conditions.

Now we can draw a conclusion for the planing of economic policy: its measures must be distributed between the necessary of the lowering of unemployment , including the way of the encouragement of the conservative model of behaviour, and the stimulation of the development of innovatory potential but not to lead to over-accumulation of the resources in innovatory sector at the expense of the concentration of the efforts on the encouragement of “innovators” exclusively. So we manage to go from the offered differential measurements of economic policy, having a local zone of setting over to the long-term oriented economic policy, which spreads the influence on the different types of agents in their systematic totality.

In the given model it’s not evidently supposed that the other agents can play not less role,than “innovators” can. The structures which had become bureaucratic (transnational corporations,financial groups and the state itself) begin to carry out the role of Schumpeterian employer-innovator in the postindustrial society. For example, in Russia the state in the person of the government as a matter of fact trades with its own state property, and it reduces the sphere of application of the efforts and reduces the own functional potencial instead of care of growth in the efficiency of exploitation and of management of this property.

So, a dangerous substitution of important functions of the state takes place – its “transaction” becomes grower and the administrative and organizational “abilities” or in other words - the level of compensation.

The “minimization” of an administrative subject is a variant of effective strategy of lowering of the given expenses,when the decisions and the responsibility for them rests with the local association as with a small organization ,which demonstrates the most stability and viability. The present model of distribution of power and of responsibility for the economic policy must not be examined within the limits of mistaken doctrine “minimum state” (when state takes minimum part in economics) but it demands the perception as a system of measures for enhancing the responsibility of the Central Government for the organization and for the achievement of the specific aims of social development of a country.

## **2. Necessity of correction of the doctrine of the “Creative destruction”**

The theory of economic development of J.Schumpeter in general developed by the Austrian economist in 1934 in the work named “The Theory of economic development”, assumed as the main motive power of development – the businessman and the enterprise activity connected with creation of the new combinations in economy.

The Occurrence of new combinations is connected with activity of the businessman-innovator which borrows a resource from the old combinations which realization is connected with activity of “conservative”. As a new combination – Schumpeter understands five cases:

1 a manufacturing of the new, unknown blessing for consumers, or creation of a new quality;

2 introduction of a new, unknown before, a way of manufacture in which basically lays unessentially not only a new discovery but also a new way of commercial using of the goods;<sup>3</sup>

3 a discovery of a new commodity market where the given industry of the country hasn't been presented, independently there was this market till this time or not.

4 the reception of a new source of raw materials or semifinished products irrespective of, there was this source before, or simply it was not taken into consideration, or was considered inaccessible, or it should be created.

5 the reorganization – creation of a monopoly position or liquidation of that.

Quoting Schumpeter, it is often lost that he lists five cases from the point of view of development and content, noticing that the “speech comes about a new combination of means of production”<sup>4</sup>.

And really, a new combination, whether it would be a product or technology, is developed on the basis of already existing means of production, as the creation of the new means of production is already itself the new combination, capable to have the most fundamental consequences for economic development. At the same time as it is available there are a five types of new combinations, so for some of them new means of production can be necessary, but it is enough for others – old and others don't need an additional resource at all.

An Idea, according to which new combinations borrow a resource, that is distinct it, from old combinations, has been designated as “creative destruction”. By means of this concept the competition mechanism between old and new combinations and in the enterprise environment was explained. Further, the given logic has taken a form of concepts of a technical and economic paradigm, its version – technological way and – obvious – taxonomical character of this concepts didn't cause any doubts. Technological possibilities of a society passed a certain stages which were allocated in the form of a paradigm or way in its development. And the subsequent stage was based on the previous resources and used these resources for itself.

The same thought is embodied and released in a hypothesis about presence of macrogenerations (when the total product is divided into some life cycles, replacing each other in the rather short intervals of time, that is poorly enough logically explained and well-founded).

It's interesting to notice that the problem of saturation of technological possibility when such approaches were formed, was poorly enough investigated.

If technological possibilities “were sated” it doesn't mean that the resource is given under a new combination. All can be perfectly different – a saturation means a stabilization of consumption of the resource and volume of output when these parameters have reached some maximum. And in this sense, the available resource won't be involved further, therefore there is an original reserve for occurrence of a new combination.

It is very important to specify also that the credit and financing are the major conditions for the occurrence of a new combination, activity of the innovator. An advance payment, creates the future combination and allocates under it a resource, or even creates the new means of production under a certain combination, thus the creation of such means of productions acts as already a new combination.

Thereby, the scale of a new combinations as though doubles or increases in several times that it is possible to consider as the animator of new combinations in economy.

However for effect of animation on new combinations in economy is available and perfect for an other basis connected with the maintenance of process of creation and development techniques and technologies. And from these positions the effect of animation of new combinations doesn't depend on the finance, but depends on the condition of scientific and technical shots and conditions of research work.

Considering the named circumstances, the importance of current economic structure and its efficiency sharply increases. If, having financed a new combination, the money are put into circulation and the combination is created a final time, the inefficient structure is capable to transform a gain of monetary weight into amplifying inflationary pressure which will increase costs of this new combination and will create necessity for additional financing which it will be

already difficult to give because of unforeseen changes, a rise in prices and percent. In that case, the new combination will be "eaten" by inflation, to be exact, an inefficiency of economic structure. Thus old combinations and their markets can undergo reduction without occurrence of new combinations, differently the conservative model of behavior of agents will suffer losses, and unemployment will increase.

In earlier works in 2003-2005, using the concept of a monetary range, which followed from J. Schumpeter's idea, that "the innovator rushes to success, having ridden the debts", that is the accessible credit and absolutely other volume of cash security in unit of time rather than for the conservative in similar conditions is necessary for him and I managed to formalize Schumpeter's key idea having adhered a model of economic behavior to some size of changing cash security<sup>5</sup>. Thus, in some monetary range there was a transformation of the conservative into the innovator and back, and the behavior of the type of "simulator" of the advanced achievements could be considered as an intermediate condition between the innovator and the conservative and accordingly to make changes to the function describing the disposable monetary weight by this or that agent. When the conservator lost necessary money resources to be present in the stereotypic, classical markets he came nearer to bankruptcy that is became unemployed. Thereby, it was possible to enter the macroeconomic law of Okun connecting level of gross national product and unemployment in the country in the model, through not created share of national product. The general result consisted that the level of macroeconomic model has been given to the theory of Schumpeter, and the further development of this model is possible through specification of strategy of behavior of groups of managing subjects - innovators, conservators.

The change of function of cash security in borders of a monetary range actually set the switch when the agent switches the strategy from conservative to innovative and on the contrary, or chooses a strategy of migration which under the maintenance is all the same conservative in the sense of Schumpeter as it reproduces a new combination instead of creation of it. At least, the main result of modern perusal of Schumpeter's ideas, giving them a status of a model, was the computer's result showing that economic development is carried out not only at the expense of innovators and creation of new combinations. The high social standard of consumption, economic growth – can be reached at the expense of prevalence of the conservative model of behavior of agents, or at the expense of imitation (that confirms experience of Japan and China, and also experience of Russia when technological systems adapted in 1990-2000 to the changes by means of imitation of foreign technical decisions of our own technical decisions of last historical period, the middle of 1980 or the end of 1970's).

However, not only at level of the model which have been had on the basis of development and formalization of Schumpeter's idea appears an acknowledgment principle of not the observance "creative destruction" but also at the level of the facts of observable economic life. Certainly, the principle of the "creative destruction" hasn't been strictly proved by its author that is one more incentive motive to think of its justice and adequacy.

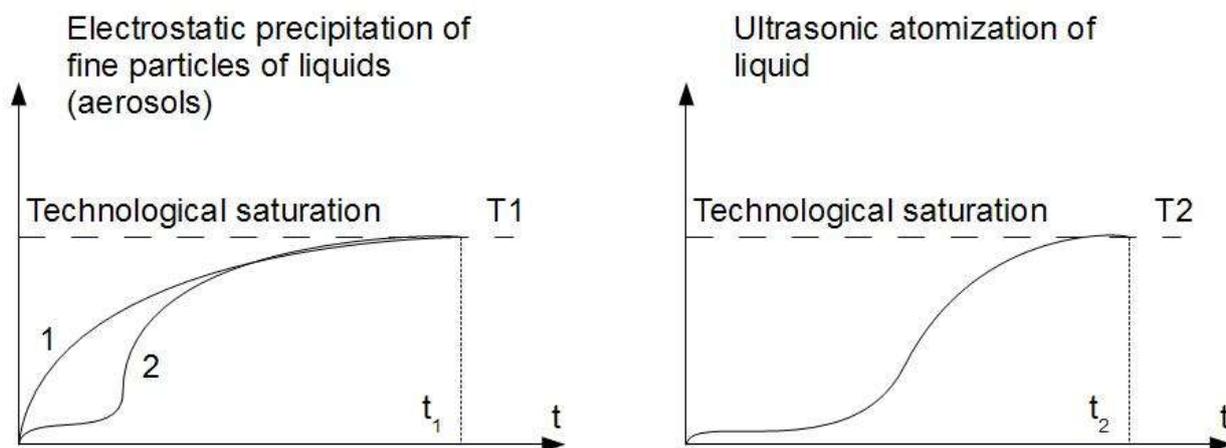
Firstly the development of information technologies and the new combinations appearing in information sector, may not demand an additional resource basically, not to mention its loan (derivation) from old combinations.

Secondly, the development of laser diffusion on silicon plates (a planar technology). This technology is known from the middle of the 1980, but till 2009 wasn't applied, as the high thickness of plates did a laser way less effective. The laser couldn't go through such thickness. The deep layers of diffusion couldn't be received in the given way. With the sharpening of plate and development of technology of reception of films with nano-thickness, that is perfection of microelectronic technology, the laser technology has "suddenly got efficiency as diffusion on thin films became possible, and accuracy is high and desirable.

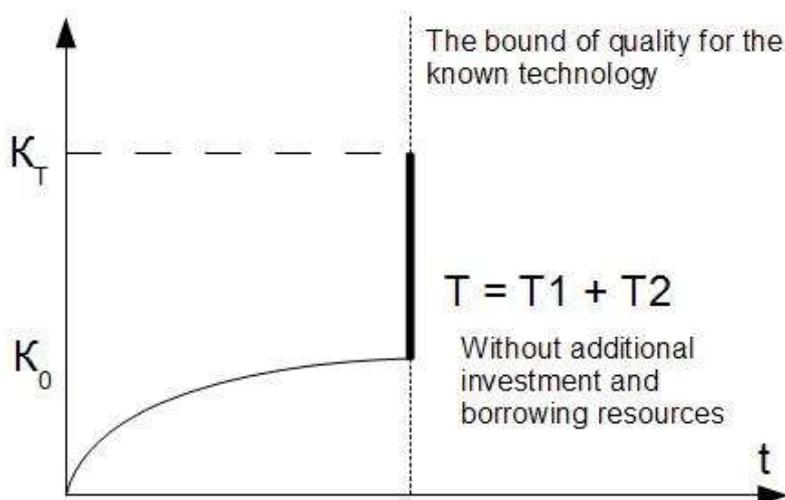
Thus, the lack of a technological level of the past became advantage after considerable time. There was a new combination, however, anybody put nothing and didn't distract any resource on it's reception.

Thirdly, in figure 8 technologies which have reached of the peak in the development and the developments which have passed the own way are presented as independent one from another so by the time  $t_1$  and  $t_2$  according to them it is impossible to consider as already new combinations. However, if to combine these technologies for reception of amorphous films (see figure 3), the standard technology of reception which is also known for a long time and is in the peak of its development it turns out races from level  $K_0$  to level  $K_T$  on quality of these amorphous films. Also possibilities of their application in the electronic and electrotechnical industry thereby extend. Thus any additional resources, any investments are not required at all. Sharpness of the engineer, the inventor is necessary only and the problem of reproduction of technologies in such a way turns to a combinatory problem. Thus, new combination  $T = T_1 + T_2$  appears. From old combinations it doesn't demand an additional resource, or derivation of a resource and technologies.  $T_1$  and  $T_2$  continue to coexist and use – everyone on the direct appointment (proceeding from the creation purposes).

Picture 8 – Technologies reached the peak of its development.



### The quality of the amorphous plates



Picture 8. – The new technology, representing associations of two technologies without additional resources and investments.

Thus, separate technologies are developed specially, proceeding from standing problems within the limits of concrete industrial or economic systems, others are the result of the break in physics or chemistry, or in a joint of sciences, and the third – by combinatory mixing. Generalizing, it is possible to assert that, considering set of various variants of development of technical systems, all the same “combinatory” property at occurrence of a new combinations starts to play more and more important role. And it isn't connected in any way with capture or resource loan. Most likely, on occasion, ever capture of an intellectual resource isn't necessary.

The named examples make a numerous field in behavior of agents “high tech”. Certainly, the analysis shows a deviation from the principle of “creative destruction”. Development of technics and high innovations assumes the other logic than the linear loan of the resource from the old combinations. Most likely, it's a logic of the haute couture, interspecific resource (the term entered by O. Williamson) confidential workings. Invention, the scientific work, carried out also in the conditions of “old” means of production, never the less, can give new combinations. The question concerning how much in general it is possible, using “old” resources to create new combinations and whether “new” resources will be necessary for this purpose, has the answer in frameworks of logic of perfection and technics development. The answer is defined by problem statement, level of design statement. If it is said about outer space exploration also new combinations of intelligence and even administrative decisions were necessary. In a index point of this project the science has given the exact answer that is enough resources for the decision of such problem.

In the conditions of depression and economy crisis (financial crisis of 2008-2009) when the effect of “disappearance” of the finance was observed, there was a curling of orders in the industry and other sectors. As a result, firms, curtailing one technical directions of work, started to “try” development of the other technical directions. Thus, no transfer of resources occurred – one work and orders simply stopped, the personnel was reduced, but appeared some new orders, in the new markets, at reduction occupied and release volumes. These cases break a principle of “creative destruction”.

Lately in Russia some works of well known economists have appeared who bring “intellectual base” under necessity of strategy of loan of technologies (especially technologies of the wide application).

As a rule, these economists understand poorly enough real manufacture, a condition and dynamics of development of domestic technical systems. The problem is in the fact that, even without their discussions of the last time, throughout all the 90's and 2000's a technological systems of Russia developed as “loan” methods, that is reproduced foreign technical decisions, simulated the equipment.

Nobody also burned off this process after a Soviet period, only the volume of such imitations has essentially increased in the specified years. Therefore the recommendation about necessity of the given strategy looks, at least, idealistic, and theoretically its poorly proved, as de facto, its practical realization resulted and leads to the further degradation of engineering schools of Russia, it's scientific and technical potential, with a weak complection of positions in the field of competitiveness of technological systems as inside Russian and the international markets.

It is represented that the idea concerning refinancing of commercial banks by means of buying the bills of the industrial enterprises, borrowed from the experience of post-war Germany, isn't capable to lead to percent decrease, alignment profitabilities between industry and economy sectors, but is capable to generate a new “bubble” with securities, in this case with bills. Anyway it's represented to us more bulky, rather than the method of “a percentage portfolio” called to lower profitability of the bank-financial transaction and raw in sector and to raise security money resources fo industrial sectors, under concrete grocery decisions for home market.

## Bibliography

- Attaly Zh. World Economic Crisis: What Comes Next – SPb: Peter, 2009, 176 p.
- Buajee R. Regulation Theory. – M: RSHU (RGGU), 1997. – 213p.
- Galbraith, J.K. The Great Crash of 1929 – Minsk: "Popourri", 2009. – 256 p.
- Crugman P. Return of Great Depression. – M:Eksmo, 2009. – 336p.
- Crugman P. Why Is Economics Powerless? / [www.slou.ru](http://www.slou.ru)
- Nelson P, Winter S. Evolutionary Theory Of Economic Changes. – M:Finstainform, 2001. – 474p.
- Sukharev O. S. Economy Of Technological Development. – M: Finance and statistics, 2008. – 480p.
- Sukharev O. S. The Theory of Economy Efficiency. – M: Finance and statistics, 2009. – 368p.
- Tobin J. Monetary Policy and Economic Growth. – M: the Publishing house «Либроком», 2010. – 272p.
- Hodgeson J. Economics and Institutes. – M: Publishing house "Delo", 2003. – 464p.
- Dosi G. Statistical Regularities in the Evolution of Industries. A Guide Through Some Evidence and Challenges for the Theory, in F. Malerba and S. Brusoni (eds.) Perspectives on Innovation, Cambridge, Cambridge University Press, 2007.
- Cantner U., H. Hanusch, Evolutionary Economics, Its Basic Concepts and Methods. A tribute to Mark Perlman, Editor of the Journal of Evolutionary Economics 1991-96, in: Lim H., U. K. Park and G. C. Harcourt (eds), Editing Economics. Essays in honour of Mark Perlman, Routledge, 2002, pp. 182-207.
- Freeman, C. Technology, Progress and the Quality of Life, Works for XXV Anniversary of SPRU, SCIENCE AND PUBLIC POLICY, Vol. 18, No. 6, December, 1991, pp. 407-418.
- Freeman, C. The Economics of Industrial Innovation. London, Francis Pinter, 1982.
- Galbraith, J.K. 1961. The Great Crash, 3 edn, Cambridge, MA: The Riverside Press.
- Hanusch H., A. Pyka (eds), The Elgar Companion to Neo-Schumpeterian Economics, Edward Elgar, Cheltenham, 2007
- Hanusch H., A. Pyka, Principles of Neo-Schumpeterian Economics, in: Cambridge Journal of Economics, 31, 2007, pp. 275-289.
- Keynes, J.M. A Monetary Theory of Production, reprinted in D.E. Moggridge ed., (1973) The Collected Writings of John Maynard Keynes, vol. 13, 408-411, London: Macmillan.
- Keynes J.M. The General Theory of Employment, Interest, and Money, New York: Harcourt Brace, 1936.
- Krugman P. How Did Economists Get It So Wrong?//The New York Times, September 2, 2009, pp. 3-8.
- Minsky H.P. The Role of Employment Policy, in M.S. Gordon, ed., Poverty in America, 1965, 175-200, San Francisco: Chandler Publishing Company.
- Minsky H.P. On the Non-neutrality of Money, Federal Reserve Bank of New York: Quarterly Review, 1993, 18 (1: 77-82).
- Nelson R. Economic Development from the Perspective of Evolutionary Economic Theory Oxford Development Studies, 2008, 36, (1), 9-21.
- Perez C. Technological roots and structural implications of the double bubble at the turn of the Century, April 2009, CERF WP No. 31, Cambridge Endowment for Research in Finance, Judge Business School, University of Cambridge, U.K. Revised version published as: 2009. "The Double Bubble at the Turn of the Century: Technological Roots and Structural Implications", Cambridge Journal of Economics, Vol. 33, No. 4, pp. 779-805 ISBN 0-86187-949-X.
- Saviotti P. P., Pyka A. Economic development by the creation of new sectors, Journal of Evolutionary Economics, 2004, Vol.14, 1-35.
- Saviotti P.P., Pyka A. Economic development, qualitative change and employment creation, Structural Change and Economic Dynamics, 2004, Vol 15 265-287.
- Saviotti, P.P., Pyka, A. Product Variety, Competition and Economic Growth, Journal of Evolutionary Economics, 2008, Vol.18, 167-182.

Saviotti, P.P., Pyka, A. Micro and macro dynamics: Industry life cycles, inter-sector coordination and aggregate growth, *Journal of Evolutionary Economics*, 2008, Vol. 18, 323-348.

Saviotti, P.P., Pyka, A. On the Co-Evolution of Technologies and Financial Institutions: Economic Evolution at the Edge of Chaos, presented at the 14th International Conference on Computing, in Economics and Finance, Paris, June 26-28, 2008.

Schumpeter J. *Business Cycles: A Theoretical, Historical and Statistical Analysis*. – New York and London: McGraw-Hill Book Company Inc., 1964.

Schumpeter J. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and Business Cycle* / Tr. By R. Opie. – New York: Oxford University Press, 1969.

Veblen, T.B. 1901. "Industrial and Pecuniary Employments," *Publications of the rd American Economic Association*, 3 Series, 2 (1: 190-235)