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The Contract Theory: A 3-Dimensional Reflection on Commodities & Capital Conversions

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Abstract: Contract Theory is a relatively young field of the economic science. The uniqueness of this branch of investigation is established on the basis that it is crucial to study the origin of microeconomic and macroeconomic indicators. In particular, because of this theory of contracts, it becomes possible to properly evaluate the performance of the real balanced growth. The study of the theoretical foundations of contracting paves the way for further development of particular tools for analyzing economic policies.

Keyword: trade flow, cash flow, reproduction, TIO, circulation, input-output.

1. INTRODUCTION

The analytical techniques developed for evaluating the domestic product fail to ensure the assessment accuracy of the cost of consumed goods and services. Therefore, measuring the real final product is only based on the inflation indicator that is entailed from the nominal GDP indicator. At the same time, (Piketty, 2015, p.592) discovers that the indicators of inflation and real economy growth, as analyzed by using the currently available analytical techniques, may not always be accurate.

The members of Kazakhstan's economists' interest group are currently developing a program to enable the process of decomposing intra-industry input-output tables into smaller regional components. Such regionalization of the intra-industry balance sheet is deemed to clearly define the deviations between the indicators of the real and financial sectors in the development of the market economy. Specifically, the decomposition of the country's intra-industries balance sheet, as reflected in the country's input-output tables, into smaller regional components could better mirror economic activities of the subordinate administrative and territorial subdivisions within the common national management system, and would

enable the setup of a new analyses model for qualitatively overseeing regulatory policies for sustainably developing the national economy.

The concept that lies in the foundation of the program was initiated by the President of the Republic of Kazakhstan Nursultan A. Nazarbayev (2009). The core of the concept focuses on the right "choice of the innovation types, on which the 'currency-and-financial system' of the country and of the rest of the world would be based. Such choice is viewed as the nucleus of the socio-political, technical, and technological milieu, in which every citizen would want to live. That is being desired by not only every citizen but also every family, every country, and the entire world.

The development of the analytical tools and techniques in line with Nazarbayev's concept suggests that wreathing of benefits that item from technical and technological innovations in the real economy should be commensurate to socio-political innovations, especially in managerial decision-making. The latter has been set on a sound footing based on currency and financial innovations.

Measuring the true costs of goods and services, as reflected in (Nazarbayev, 2009), is a distinctively new concept when compared to the existing approaches in the development analysis of a market economy. The unique content of the concept is linked to such a methodology that the key is the assessment of the performance quality of the institutions that implement the following three major innovational technologies within the cycle of reproducing capital in its monetary form, and capital in its commodity-form:

- The real sector technical and technological innovations,
- Currency-and-financial innovations in managerial decision making, and
- Socio-political innovations in managerial decision making

The specificity in measuring the true cost of goods and services under Nazarbayev's concept is given through the fact that production growth is closely aligned with conservation of resources. Likewise, it is in line with the output increase of intermediate consumer goods. The latters are in essence directly involved in the production of output. The socio-economic effect of Nazarbayev's concept is in its negligence of the idea of generating profit at any cost. At the same time, according to (Nazarbayev, 2009), profit may be obtained through efficient utilization of material, technical, and financial resources. Such efficiency needs to be addressed in the production of each and every unit of the final product.

2. THE PURPOSE OF THIS WORK

The analysis of the macroeconomic dynamics using the three-component reproduction model, developed by Russian academician Alexander G. Granberg (1985), has shown that economic growth indicators, specifically identified for sectors of an economy, and their growth rates have to be defined by decision makers. The key value of the Granberg model has been attached to the reduction of a weighted average of material intensity in the gross domestic product. However, such contraction, according to the Granberg model, "may be a cause of a more compounded impact on the dynamics of the three components" (Granberg, 1985, p. 109). It is because the changes in the expenditure coefficient of one component necessitate changes in the other component.

The solution as for how to satisfy the Granberg-identified need for a reduction of material intensity in the gross product may be found in the comments by F. Engels and were reflected in the Supplement by F. Engels to Capital. On this matter, F. Engels wrote the following:

> "The development of the productive power of labour reacts also on the original capital already engaged in the process of production. A part of the functioning constant capital consists of instruments of labour, such as machinery, which are not consumed, and therefore not reproduced, or replaced by new ones of the same kind, until after long periods of time. But

> every year a part of these instruments of labour perishes or reaches the limit of its productive function. If the productiveness of labour has, during the using up of these instruments of labour, increased (and it develops continually with the uninterrupted advance of science and technology), more efficient and (considering their increased efficiency), cheaper machines, tools, apparatus, replace the old. The old capital is reproduced in a more productive form, apart from the constant detail improvements in the instruments of labour already in use. The other part of the constant capital, raw material and auxiliary substances, is constantly reproduced in less than a year. Every introduction of improved methods, therefore, works almost simultaneously on the new capital and on that already in action. Like the increased exploitation of natural wealth by the mere increase in the tension of labour-power, science and technology give capital a power of expansion independent of the given magnitude of the capital actually functioning. They react at the same time on that part of the original capital which has entered upon its stage of renewal. This, in passing into its new shape, incorporates gratis the social advance made while its old shape was being used up. Of course, this development of productive power is accompanied by a partial depreciation of functioning capital. Labour transmits to its product the value of the means of production consumed by it. On the other hand, the value and mass of the means of production set in motion by a given quantity of labour increase as the labour becomes more productive. Though the same quantity of labour adds always to its products only the same sum of new value, still the old capital value, transmitted by the labour to the products, increases with the growing productivity of labour."[1]

By carefully reading through Engels' comments on K. Marx' Capital, the accurate measurements of capital in its monetary form ($Y = V + M$), and capital in its commodity form ($X = C + V + M$), one may find that these equations may well serve the basis for solving the Granberg urge, targeting at the reduction in material intensity of the gross product. In other words, the three dimensional measurements of the indicators of the nominal GDP (NGDP = Y) help to define the cost of the final product, i.e., by means of the indicators of the gross aggregate product ($X = C + V + M$). That represents the sum of costs, including materials, in the form of the annual income ($Y = V + M$). Without using the three dimensional method to measure the final product indicators, the solution of the Granberg puzzle is deemed impossible or difficult.

The research subject matter of this work, as first revealed by Granberg, relates to the subjective need to track down the material cost and the efficiency of production resources. As such it echoes the following definition of this problem, as formulated by M. Porter (2002, p. 496, 220): "Any motion in a developed economy requires developing a sound local competitiveness. Competition should be in line with the shift of the major focus from low wages to low costs. That would require improvements in the efficiency of production and of services".

3. GRANBERG'S CONTRIBUTION OF UNVEILING THE LEONTIEF PARADOX

A. Granberg not only discovered the function of the costs of production resources, but also led his followers to a search of the true cost of goods and services. Moreover, he succeeded in explaining the Leontief paradox. The approach developed by W. Leontief consisted of numerical measurements of not only production, but also distribution of the common good. He constructed the reproduction schemes of the gross product. According to Granberg, Leontief discovered a new area in the economic science by blending the economic functions theory with mathematical modeling, systemic techniques, and processing of the economic information (Suslov V.I., 2016).

Granberg named Leontief as the most pragmatic economist-theoretician. Leontief's research methodology was built on practical observations and analyses of structural shifts in

[1] Marx, K., Engels, F. Collection. Ed.2., V. 25, P. I, p. 286.

economy and trade. Unexpected conclusions were quite frequent outcomes of his research. The Leontief paradox is now well studied academically. Granberg acquiesced to Leontief's thought that the United States of America must interact with the rest of the world in such a way that its exports are capital intensive and imports labor intensive. Such stance is stemmed from the stature of the U.S.A. as an excessively capitalized country with a relatively limited highly paid labor market. In this regard, Leontief found that the U.S. did export labor and import capital. Such a statement though had found no reflection in the well-known theories on foreign trade (Suslov V.I., 2016, p. 163-164). For instance, the Heckscher-Olin theory explained it differently.

The scientific essence of Leontief's approach lies in applying systemic thinking and logic to find economic solutions. Then, what is the Leontief paradox? The assessment of changes in the structure of the costs of materials, labor, and capital resources per a unit of production of the final product is the core of the Leontief paradox.

Absence of juxtaposition between the methods of market-based planning and those of planned economic management, as shown in Leontief's approach, is important. Leontief viewed an economy as a ship where private initiative is the wind, while planning is the steering wheel, which shows the direction. He pointed out the need for setting an equalizing balance between market and state (Suslov V.I., 2016, p. 181). In our view, the Leontief concept fully complies with the three dimensional measurement of capital in its monetary form, as a mechanism of pushing the market-based economy forward, and capital in its commodity form, as a mechanism making the management of state-run economy with limited resources effective.

4. THE FOUNDATION OF THE CONTRACT THEORY

The contract theory is based on the principle of gaining mutual benefits from a trade deal. In this theory, market relations are represented as a cycle of reproduction schemes of goods and services that mainly consist of the conversion of the capital in its monetary form, to the capital in its commodity form. The contractual relations between economic actors form the foundation for mutual conversions within the common cycle of capital and commodity.

The basis of the contract theory is similar to the cyclical cost of capital in its monetary form, and the cost of capital in its commodity form.

In formulaic terms, measuring the indicators of the cost of capital in its money form ($Y = V + m$), and capital in its commodity form ($X = C + V + M$), has been confirmed by the fact that the cost of capital in its money form (Y) has originally been determined in monetary terms. However, the cost of production (X) has been determined in monetary terms, and also in terms of time, which has been utilized for labor.

Let the average price of a unit of a national currency, as measured by purchasing power, in relative terms, be indicated as purchase power of the national currency (PPNC) following a balanced equation, which, in legal terms, has been notary-verified and signed as a contract. Such a contract-based equation has close linkages between aggregate labor costs (X) in the form of a reward of labor, and final outcomes of labor (Y) in the form of a chain of surplus value. As with the account of 'PPNC' and 'Wages', such legally binding act of purchase and sale may be presented by the following equation of the contract theory:

$$Y \times PPNC = X \times Wages \tag{1}$$

Since the contract has the power of a law, equ. (1), as a theoretic reflection of the noted specific law, has a legally binding force. This described pattern works in such a manner that is analogous to the power of either the Ohm's law in physics or the natural law of gravitation. However, equ. (1), upon having been converted to economic terms, is itself an economic law.

When this particular economic law, as represented in equ. (1), is extrapolated onto various sectors of the economy and various types of economic activities, the economic law, well known to experts in the area of analysis of intra-industries input-output tables, may easily be obtained as follows:

$$T \times Y = t \times X \tag{2}$$

where $t = W$ is the direct labor intensity of the product, and $T = PPNC$ the overall labor intensity of the product, as complied with the cost of final product (Y) and the aggregate sum of the costs of materials and financial resources that have been utilized in producing product (X).

Let the coefficient 'c' be the proportionality of $Y: X_B$ in monetary terms. By measuring the variables in labor terms, we obtain the following equation: $c = t/T$. Both of these proportions are economically essential functions of time. In fact, they are equal to each another. Here, the first proportion represents the cost of final product (Y), the sum of the costs of materials, labor, and capital resources, vs. the production (X). It changes over time. Each increase in the relevant coefficient 'c' over time reflects an increase in the volume of the final product (Y) that items from the utilization of resources for production (X). Any reduction, of this coefficient over time indicates a decrease in the volume of the final product.

The above-noted changes over time occur under the pressure of new, innovative technologies, etc. In a series of turnovers of capital and commodities, the growth rate of the technological potential of any economy may be determined. Therefore, the indicator, referred to in this paper as 'c', shall be named as the 'coefficient of science-and-technology potential'.

The second proportion also tends to change over time. However, its reverse measurement ($1/\mathrm{c}$), which represents the proportion of full (direct and indirect) labor costs vs. direct costs ($1/\mathrm{c} = T/t = 1 + (T - t)/t$) may be interpreted differently. In this regard, the Leontief paradox is based on this particular economic law.

Any theory is enlivened only when it is positively tested in real time practices. For that matter, the contract theory is not an exception. And, the reciprocal technological cycle of the mutual conversion of physical measurements of commodity masses into monetary masses has clearly been observed in practice. For example, we may admit the hypotheses relating to the annual volumes of goods and services as ones that have been realized in-kind, denoted as 'Kt', of the currency unit. Those that constitute gross proceeds are marked as 'KD'.

Then, the price of commodities (PoC) is given by $PoC = KD/Kt$, and the proceeds from sales are $\mathrm{X} = PoC \times Kt$. In that case, the velocity of money in the national currency unit will be equal to 'vx'. The Marxian reproduction schemes formula may be rewritten as follows:

$$\mathrm{X} = vx \times \mathrm{M}. \tag{3}$$

From the this, the following equation is derived:

$$\frac{X}{vx \times \mathrm{M}} = 1, \tag{4}$$

or

$$\frac{Kt \times PoC}{vx \times \mathrm{M}} = 1. \tag{5}$$

The afore-described hypothesis, as accepted by this paper, fully complies with the Clark concept where any realized commodity-based product is represented as a sum of the elementary utilities of the material wealth, which has been utilized in producing the materialized commodity-driven product (Clark, 2000, p.220).

In spite of the opportunity readily provided in evaluating the effectiveness of regulatory policies by the three-dimensional measurements of the cost of capital in its monetary form and capital in its commodity form, in compliance with the Marxian reproduction scheme, additional analyses are currently undertaken by means of a more simplified technique following A. Smith's one dimensional income method (Smith, 2007, p. 960). Under the Smithian income method, the nominal GDP is determined by simply deducting the costs of materials (QP) from the proceeds (X): $NGDP = X - QP$. Such calculations do not account for the contract theory, of which the main processes have been represented in equ. (1). In this regard, equ. (4) loses its original macroeconomic content and acquires quite a new setting. In the end, it converts to a macroeconomic equation incapable of solving the Granberg puzzle:

$$\frac{NGDP}{vn \times M} = 1, \tag{6}$$

where 'vn' stands for the velocity of money. equ. (6) contains no physical dimension and is therefore represented by its monetary form, only. A. Smith who defined labor as a sole method of measuring the annual income turns out to contradict himself. His followers are using a specific indicator, namely, the GDP deflator, to determine the physical volume of the final product.

In reality, however, the GDP deflator, which has been derived from physical indices of goods and services, does serve as both a universal economic indicator, which is necessary to install the required dynamics of market prices on goods and services, and an indicator of the dynamics of the purchasing power of money in the financial system. Since the latter indicator supports the balance in the nominal GDP as well as in real GDP ($NGDP = \mathrm{p}b \times RGDP$), equ. (6) is then helpful in determining $NGDP = vn \times$ M. As with ceteris paribus, we have the following equation:

$$\mathrm{p}b \times RGDP = vn \times M \tag{7}$$

where the velocity of money 'vn' is itself a function in the velocity of money in the proceeds 'vx', and also dependent on the pace of money turnover in the intermediate product 'vz':

$$vn = \frac{X}{M} - \frac{QP}{M} = vx - vz$$

and so, we have:

$$vn = vx - vz. \tag{8}$$

Therefore, equ. (8) relates the velocity of money 'vn' to the pace of the turnover of the nominal GDP and the pace of the turnover of intermediate commodities. The indicators of proceeds $PoC \times Kt$ are therefore directly linked to the indicators of consumption of the intermediate products QP and the nominal GDP.

Based on equ. (8), emerges an opportunity for developing an operational technique, capable of transforming real economies into the engine of sustainable economic growth, meaning that the GDP price deflator (inflation indicator) and purchasing power of money may be transformed into the key indicators of managing innovational investments.

The GDP price indicator (inflation indicator) is an integral factor consisting of such components that possess not only destructive, but also, constructive forces in developing the market economy. Investigating its structure may help analyze the differences between the pace of implementation of technical and technological, 'currency-related' and financial, and socio-political innovations.

5. CONTRACTS-BASED METHODS OF ANALYSIS FOR ECONOMIC POLICIES

The Sraffa's Model: production of commodities by means of commodities. The main idea behind this model (Sraffa, 1960) is found in the intra-industries nature of reproduction. The final product of one type of production serves the raw resource for the other type.

In reality, the reproduction cycle forms a cycle of reproduction, where the final product is fully defined, and wages may contain the component of a surplus value, because the profit margin is defined by the interest rate. And that feature of Sraffa's Model is distinct from the marginal utility theory, where the correlation between supply and demand may serve as the law on distribution. It also differs from the labor theory, where wages are defined by the means that provides the living to the worker and his/her family. Similarly, the profit margin is defined by production technologies.

The Ronald Coase Conjecture (1960). The theory (Kapelushnikov, 2017) stated that firms are created when transaction costs are lower inside the firm than outside it in the open market. It means that if the property rights of all parties are carefully defined and transaction costs nullified, then the final outcomes do not depend on the changes in the distribution of property rights. However, in the process of accounting the transaction costs, the desirable outcomes may not always be attainable. In this regard, high costs of obtaining the required information, conducting negotiations, and settling disputes may exceed potential benefits of the deal. Besides, when accounting losses, there may appear essential differences in propensities of contractors on recording the losses. A reference to the potential impact of the income (that later became the core of the neo-institutional theory) has been introduced to capture all the afore-described differences.

Nevertheless, the Coase theory fails to reflect the details of why some firms grow owing to the integration of sequential production stages, while others focus more on just one or a few production stages. The energy sector serves as an example of such integration where coal mines are paired with hydropower stations that work on coal.

The Williamson's theory of transaction costs[2]. Conceptually, this theory, established in 2009, is closely associated to the costs of contract settlements and regaining the right to property, or other services within the acts of interaction between two or more participants of a contract.

According this theory, the hierarchical structure prevails in the market until it ensures an inexpensive and expeditious method of resolving conflicts. If the three agents cannot resolve their disputes relating to work load distribution and income, the manager steps in to resolve those disputes.

Not only from the economic stance has Williamson's concept been thoroughly studied, but also from the legal standpoint where a contract is regarded as an organizational component in harmonizing work processes. The theory ensured the unity of economies and legal acts, backed up by contracts and, thus, led to a more profound understanding of the aims and objectives of a collaborative work.

The Williamson's firm has been depicted through the prism of institutional notions, not industrial. A firm and a market are being judged by their capacities to conduct various transactions, enabling resource minimization. The theory also pointed out that production facilities standing afar from one another are more likely to group together under the same owner.

Oliver Hart and Bengt Holmstrom (Kornelyuk, 2016): Market economy is the economy of contracts. The theory is developed by Hart and Holmstrom to define the parameters of contracts. The theory has been valued for its advocacy of mutually beneficial decisions

[2]*The Theories of Transaction Costs. Chapters on Economics*. History of the Economic Science. Retrieved from: (http://ecouniver.com/economik-rasdel/istekuz/215-teorii-transakcionnyx-izderzhek.html)

relating to contracts' parties. It is of practical value for any of the macroeconomic models geared to balance economic growth. In macroeconomics, the theory may serve as the basis for analyses of varied contracting models, such as rewards of top managers, franchises, surplus insurance payments, and privatization of public enterprises. It has been effective in decision-making on investments and incentivizing economic activities through a choice of optimal efforts.

The Sagadiev theory of surpluses' exchange. Among Kazakh economists, the specific subject matter of a surplus exchange has been thoroughly studied by Nurlan Sagadiev. Sagadiev (2004) concluded that neither special effects nor production costs, nor income, determine the final outcomes of market relations. The Sagadiev approach resonated with the theories developed at different times by Williamson and Hart. Sagadiev developed linkages in the formation of the surplus value and connected those to the sales profit.

To show the appropriateness of his theory's stance, Sagadiev made a reference to the research by D. Rosenberg, who provided his valuable comments relating to K. Marx' Capital as follows: "it may seem that K. Marx did not provide all the components of the whole chain that are necessary to transit from simple commodities turnover to the production of surplus value. It may also seem that he did not explain the details pertaining to the trade. Those have been named by Prof. N. Sagadiev as a perfected cycle of commodities, which sets the grounds for capital. According to him, profit is a category, which is unknown for a casual turnover of commodities. It has first emerged in trade. In this regard, the then K. Marx had proceeded to investigating the details of the surplus value, which was based on the mature capitalist method of production. The profit faced by sellers at different times, relating to the existence of trade, had various sources. Those, sometimes, were mere robberies" (Rosenberg, 1984).

Sagadiev (2004) concluded that "consumption, which delivers wealth, and labor, which creates wealth, in fact, are the characteristic features of wealth. Accordingly, there exists the difference between the cost of the commodity and its consumer cost. And, that may be named as the surplus value in order to be abstracted from the postulates formulated by the Marxian surplus theory. In other words, it is that component of the surplus value of wealth, which surpasses the cost". Additionally, Sagadiev considered that Condillac not Marx was the first to discover the true source of creation of the surplus. It was Condillac who questioned the surplus, the phenomenon, which came to be the subject of exchange. According to Sagadiev (2004, p. 90), the latter should be regarded as an alternative to the paradigm of the cost, which has governed economic thinking since the times of Aristotle.

The results of Sagadiev's work and the logic of his methodological approach captured researchers' attention, especially, when he presented his theory of contracts. In particular, he stated the following: "By purchasing a commodity, a buyer enters into the relationship with a producer of the commodity. The producer wants to be rewarded for his labor. Therefore, his cost is based on the volume of those benefits that are necessary for maintaining his labor continually. After the sales of his commodity, the producer becomes a buyer and enters into the relationship of exchange, possibly, with the same seller of a consumer commodity. As a buyer, the producer is interested in the consumer cost of the commodity. By means of the consumer cost of the commodity, he should reward the costs of his own labor.

No doubt, the demand of a producer of commodities is not for one specific commodity but for a set of commodities. The labor costs are rewarded by some set of consumer costs. At the same time, if we consider the aggregate of all commodities as one commodity, and also, all sellers of commodities as one seller, then we can consider the act of the exchange as one deal where the aggregate consumer cost of the aggregate commodity is greater than the labor cost of the commodity. The cost, which the producer receives, in exchange of his produced

commodity, in the form of money, becomes the means of the evaluation of the consumer cost of the commodities that he needs for his life.

The metamorphosis of commodities for the producer concludes by the fact that the producer receives one good instead of the other: T-D-T. The producer materialized it in the capacity of the cost, i.e. as that volume of consumption, which is necessary to reward his expenses, in exchange of the consumer cost of another commodity, which satisfies his needs. Eventually, for the producer, the three different commodities have similar costs of exchange because those have been exchanged for the similar quantities of money. However, in one instance of exchange, the subject of exchange has reflected the true cost of the commodity and, in another instance, the subject of exchange has turned out to be the consumer cost of the commodity.

The final metamorphosis of commodities for the seller acquires the reflection of the following sequence: 'D-T-D'. Here, all the evolutions went upside down. One and the same commodity had different exchange value. In buying the commodity, the buyer should have paid its cost. However, the same buyer was selling the commodity at its consumer cost. The difference in money had been the consumer surplus cost.

At first, such method of creating the surplus value may seem to depend on the will or whim of certain individuals. In the real world, things do happen in accordance with this particular method. However, things are not solely confined to such a method. A buyer and a seller are presented in the personified actors of economic activities.

The role played by a seller has been in converting the production costs to consumer costs. In this regard, the producers have been in need of sellers. The sellers have been in need of producers. To perform his duties, a seller has to have money and commodities. To ensure such possessions, he has to accumulate excess commodity and excess money in the form of consumer surplus costs.

As mass volumes of commodities and money are being exchanged through sellers, the aggregate seller in the eyes of an autonomous producer is associated with the world of monies and commodities. The wider the exchange of commodities and monies is, the wider the division of labor, and the more powerful the role of the seller in the life of the society.

By carefully looking at the evolution of the capitalist production relationship, specifically, the example of England, one may observe that trade surplus has been the first ever to create the initial form of the accumulation of capital (Sagadiev, 2004, p. 90).

By substituting 'economics of the buyer' in Sagadiev's theory with 'economics of the currency-financial sector', we may see the full picture of the cycle of the reproduction processes of capital in its money form ($Y = V + M$), and capital in its commodity form, ($X = C + V + M$).

6. A GEOPOLITICAL MODEL OF DEVELOPING COUNTRIES: EVALUATING REAL SECTOR GROWTH

As mentioned earlier in this paper, Thomas Piketty noted that the concepts of 'inflation and growth' have not always been accurately defined: the division of the nominal growth into 'real' and 'inflation-derived' components are arbitrary, and thus may be disputed.

The reasons underneath the inaccurate definition of growth and inflation, in our view, are not related to the low quality of the measurement tools of the balanced economic growth. Instead, they are linked to the necessity of balancing them against real time conditions of the globalization process of the world economy.

What Piketty reflected was about the models developed on the basis of one dimensional measurement of macroeconomic indicators of the sectors of developed countries, where money of the current year has been measured by money in the previous year. According to

Piketty, the traditional tools of economic analyses do not ensure full compliance of macroeconomic interests in the development of the financial sector with the real sector interests. That entails certain risks. The development the economies of the UK and France are examples that show that such incompliances occur in spite that these economies move along the trajectories of balanced economic growth. Moreover, such risks tend to increase. So, any application of the traditional analysis techniques is subject to effects of risks.

The need for qualitatively new analytical tools in measuring and evaluating indicators of balanced economic growth is there. The construction of growth models for developing countries is linked to the marker capacities of all types in managing their growth rates, or in reducing the material intensity of the gross product. Under the condition of the globalizing world economy, the real economy mainly depends on real proceeds as well as on the efficient utilization of intermediate consumer goods and natural resources.

As reflected earlier in this paper, macroeconomic models for defining the nominal GDP are incapable of solving the current challenges related to accounting the material intensity of the gross product in view that they are not defined as part of the whole after deductions of current costs of materials and costs of wear and tear of fixed assets.

Potential solutions to the outstanding challenges regarding the regulation of the costs stemming from material expenditures and the costs of utilizing natural resources lay beyond the domain of macroeconomic regulators. Problems in this area cover the linkages of the macroeconomic indicators and are directly linked to the solution of environmental problems and the issue of green economy. That means, if we want to develop green economy and maintain a healthy environment, we should not only be directly involved in growth of current incomes and profits, but also responsibly engage in efficient utilization of materials and natural resources.

Stating the problem: The reasons behind the derivation of unbalanced indicators of growth in the above-noted sectors of economy are linked to the use of the outdated tools of assessment and evaluation of the indicators of the balanced economic growth that do not allow full compliance of interests of the real sector economy with interests in the financial sector. According to the monetarists, the Keynesian model of balanced growth was immature because in it capital in its money form played a secondary role. A much improved model, built later by Keynes, is presented as follows:

$$pp \times NGDP = RGDP.$$

In the initial formula, 'pp' stood for purchasing power of the national currency unit. In the improved model, the equation has been upgraded as follows:

$$NGDP = pb * RGD$$

where 'b' stood for the GDP deflator. Both of these models suffer from one-sidedness in measuring the indicators of the real and financial sectors of an economy, which define the volume of the real final product. The methodology of constructing these models is based on the assumption that prices for goods and services remain unchanged as well as the velocity of money. That followed the one-sided principle of measuring the quality of balanced indicators of economic growth. And that principle paved the way to the introduction of arbitrary definitions.

There also is a third model named after Mandell and Fleming. However, its close similarity to the Keynesian models can easily be spotted. The only difference between them is in that the latter are derived from the unit of a world's reserve currency instead of the units of individual national currencies.

The grave one-sidedness of measurements in the afore-mentioned models has been formed by the three concurrent economic theories. The first is the marginal inutility theory,

which defines the price for goods and services by supply and demand. The second is the labor cost theory, which defines prices for goods and services by the costs required for producing the commodity following the Marxian expenditure method.

The first theory presents income based on annual product without accounting for materials and capital costs required for production ($Y = v + m$). The second presents annual product by balancing the costs of production ($X = c + v + m$). In short, both approaches suffer from limitations of one-sidedness and one-dimensionality in measuring the indicators of balanced economic growth. One of them focuses on income in the annual production of capital in its monetary form, which is defined by using the macroeconomic approach based on $Y = v + m$. The other focuses on the capital in its commodity form, which is defined by the macroeconomic approach based on $X = c + v + m$.

The Piketty model of balanced economic growth is developed based on economic laws of development. To resolve the problem of measurements inefficiencies of inflation and growth indicators, Piketty attempted to use the Cobbs-Douglas production function by taking the aggregate elasticity factor within the limits between 1.3 and 1.6. However, these limits do not conform to the two economic laws given in his work (Piketty, 2015, p. 225).

The first of Piketty's laws is related to the dynamics of proportionality of the national capital and national income (Piketty, 2015, p. 67): $\alpha = r \times \beta$, where r denotes the capital profitability, β the accumulated capital expressed in years of the national income α. The second law, named as the law of cumulative growth and of cumulative profitability, defines the size of the cumulative capital as the proportion of the form of the accumulation 's' to the pace of the economic growth 'g': $\beta = s / g$ (Piketty, 2015, p. 171).

According to these laws and laws on population growth, any insignificant increase in the capital profitability (which prevails in the growth of the economy over the lengthy period of time) leads to significant increase in the growth of capital and, thus makes a destabilizing impact on the structure and dynamics of the social inequality (Piketty, 2015, p. 90). However, these Piketty's laws do not account for linkages between macroeconomic and microeconomic indicators of growth, while the linkages are, in fact, products of reproduction of capital in its income form, and capital in its commodity form within cycles of the development of common good.

The geopolitical model for analyzing the management efficiency of public-private partnership projects: Our discussion above shows that the evolution of Piketty's economic laws, as the principle of defining the model structure of balanced economic growth based on input-output tables, enables the use of the three-dimensional method to measure the indicators of the market equilibrium. In the following macroeconomic analyses, with due reference to equ. (2), which represents part of the three-component equ. (1) of the macroeconomic contracts theory, we will justify the macroeconomic origin of the contents of equs. (3) - (8). The macroeconomic contents of equ. (2) have been revealed by using the algorithm of scaling (Akimov, 2014), where the algorithm of scaling vectors and matrices represents the measurements of the model of intra-industries balance reflected in input-output tables. Let T^Y represents the labor intensity of the gross output, and T^X the labor intensity of the gross product. Then the concurrent measurements of aggregate labor intensity may be written respectively as t_i^Y and t_i^X, which indicate respectively the labor intensity of the final and gross product to the i^{th} extent of the sector ($i = 1, \dots, n$) of the economy. So , T^Y and T^X can be written as follows (Akimov, 2014, p. 176):

$$T^Y = \begin{bmatrix} t_1^Y \\ t_2^Y \\ \vdots \\ t_n^Y \end{bmatrix} \text{ and } T^X = \begin{bmatrix} t_1^X \\ t_2^X \\ \vdots \\ t_n^X \end{bmatrix} \tag{9}$$

Then we obtain the set of equations for the full cost of physical labor that has been utilized for the production of the unit of the final product for each of industries (Akimov, 2014, p. 176):

$$\begin{cases} t_1^Y = t_1^X b_{11} + t_2^X b_{12} + \cdots + t_n^X b_{1n} \\ t_2^Y = t_1^X b_{21} + t_2^X b_{22} + \cdots + t_n^X b_{2n} \\ \cdots \\ t_n^X = t_1^X b_{n1} + t_2^X b_{n2} + \cdots + t_1^Y b_{nn} \end{cases} \quad (10)$$

Thus, the full labor cost of producing the final product is defined by scaling the product of direct labor intensity of the gross output of all industries by relevant columns of the matrix that reflect the full labor cost in the model of intra-industries balance, which is represented in monetary form.

The true cost of money is obtained by solving the concurrent problems of the three-dimensional measurement of the balanced economic growth, on the one hand, and the product's labor intensity on the other, where the unit of money is

$$c = \frac{t}{T} = \frac{Y}{X}$$

where 'c' stands for the coefficient of the science-and-technology potential of the country, of which the increment: $(+, -)$ is defined by either the margin of changes in the price for goods and services or the measurement of rent stemming from the utilization of natural resources.

In that case, the real growth rate of the science-and-technology potential of any country $\left(\frac{\dot{c}}{c}\right)$ may be measured by the difference between the growth rate of the production cost of the final product and the cost of resources that have been utilized in the production. It is because both had been sourced from the common pool of time, spent for labor (L):

$$\left(\frac{\dot{c}}{c}\right) = \left(\frac{\dot{Y}}{L}\right)/\left(\frac{Y}{L}\right) - \left(\frac{\dot{X}}{L}\right)/\left(\frac{X}{L}\right). \quad (11)$$

Since equ. (1) defines the difference between the three growth rates of different indicators of the national economy, given the equality of the time, spent for labor that had been utilized for production 'L', it may be represented as an indicator of acceleration of the economic growth a. So, the whole of the science-and-technology potential may be defined by $L \times a$.

7. A MODEL FOR THE SCIENCE-AND-TECHNOLOGY POTENTIAL BY USING GDP DEFLATOR

Models of the science-and-technology potential may be built on the basis of converting the monetarists' equation of exchange. Let the GDP deflator be expressed by $NGDP = pb \times RGDP$ based on the monetarists' formulation. By multiplying both sides with the purchasing power of the national currency 'pp', we obtain the following:

$$pp \times NGDP = pp \times pb \times RGDP$$

which is a qualitatively new expression of the balanced economic growth and defines the real volume of the final product – $RUFR$:

$$RUFR = pp \cdot NGDP$$

which represents the nominal GDP that defines the cost of the final product and its product with the true cost of money represents the real final product.

If $c = pp \times pb$, then the purchasing power of money may be defined under the new economic law as follows:

$$pp = c/pb$$

In this case, the coefficient 'c' may be defined as the proportion of the direct labor intensity to the full labor intensity (t/T), or as the proportion of the cost of the utilized final product to the aggregate cost of resources utilized in the production (Y/X).

However, the assessment of the coefficient $c(t) = pp(t) * pb(t)$ is subject to that measuring the real GDP is done by following the method of three approaches. The first is the income method of A. Smith, according to which, capital has only one dimension, its money form. Under the one-dimensional approach to measuring the indicators of the balanced economic growth, the coefficient of the science-and-technology potential 'c' is defined as follows:

$$c = pp \times pb = \left(\frac{RGDP}{NGDP}\right) \times \left(\frac{NGDP}{RGDP}\right) = 1$$

Under the Smithian theory, the purchasing power of money is defined by: $\mathrm{pp}(t) = 1/\mathrm{p}b = RGDP/NGDP$, and the GDP deflator by: $pb(t) = NGDP/RGDP$.

The second approach is represented by the Marxian expenditure approach, according to which capital has three dimensions. In this case, capital in its money form has the money dimension and capital in its commodity form has the labor dimension. So under the three-dimensional measurement of indicators of balanced economic growth, the coefficient of the science-and-technology potential 'c' is defined by $\mathrm{c} = pp \times pb$:

$$pp \times pb = \left(\frac{RGDP}{X}\right) \times \left(\frac{NGDP}{RGDP}\right) = \frac{NGDP}{X} = \frac{NGDP}{GDP+QP} =$$

$$= \frac{\frac{NGDP}{QP}}{1+\frac{NGDP}{QP}} = \frac{\mu}{1+\mu} = c \neq 1$$

where $\mathrm{pc} = \frac{\mathrm{RGDP}}{\mathrm{X}}$ represents the price index for goods and services, and $\frac{\mathrm{NGDP}}{\mathrm{QP}}$ the indicator index 'μ', and QP the material cost of producing the final product $X = NGDP + QP$.

Since the real final product '$RUFR$' is equal to $pp \times pb \times RGDP$, all the previously discussed cases present an opportunity to re-assess the true cost of the quasi-real GDP by using the following formula:

$$RUFR = c \times RGDP.$$

Here, the main equation of assessment of the real final product '$RUFR$' at the macroeconomic level is fully defined owing to the coefficient 'c', as a result of analyzing the inputs and outputs at the microeconomic level:

$$RUFR = pp \times NGDP = c \times RGDP.$$

The result of analyzing the assessment and evaluation of the impacting efficiency of regulatory policies pertaining to the development of the national economy is presented in the equation, which defines the mutual convertibility of the cost of capital in its commodity form, back to its monetary form as follows:

$$\mathrm{c} \equiv \frac{t}{T} = \frac{Y}{X}. \tag{12}$$

8. ECONOMICALLY ASSESSING THE EFFICIENCY OF INNOVATIVE TECHNOLOGIES IN THE MONETARY DIMENSION

The difference between the marginal growth rates of capital in its money form in macroeconomics, and capital in its commodity form, is defined by the following formula:

$$\frac{\dot{c}}{c} = \frac{\dot{Y}}{Y} - \frac{\dot{X}}{X}. \tag{13}$$

For simplicity, let $a = \frac{\dot{c}}{c}$ (standing for acceleration), representing the difference between the three growth rates of the cost of the final product as an indicator of capital in its monetary form $-\frac{\dot{Y}}{Y}$ and the output of goods and services as an indicator of capital in its commodity form $\frac{\dot{X}}{X}$. It may be named as the marginal coefficient of the science-and-technology change. This indicator of the acceleration 'a' emerged as 'deus ex machina', given equality of labor and capital that have been utilized for producing the final product (Y) in macroeconomics, and output of goods and services (X) in microeconomics. So, in formulaic terms the above stated may be presented as follows:

$$a = \frac{\dot{Y}}{Y} - \frac{\dot{X}}{X}. \tag{14}$$

The final result evolves from INSIDE of the socio-economic system, which is defined by juxtapositioning the outcomes of the intra-industries balance models of the development of a country, as reflected in labor and monetary dimensions. Such an effect of the science-and-technology potential of a country, as portrayed J. Clark, relating to the macroeconomic dimension has been named as the enterprisers' profit by (Baizakov and Oinarov, 2015), and the surplus profit in the reproduction schemes, as Lenin formulated, with accounting for the scientific-technical progress (Baizakov and Oinarov, 2015, p. 172).

9. CONVERT SCIENCE AND TECHNOLOGY EFFECT IN ITS MONETARY FORM TO ITS LABOR FORM

Equ. (14) may be rewritten by representing it as the difference between the growth rates of capital profitability in its form of the cost of the final product ($\varphi = Y/L$), and capital in its form of the resources utilized for production ($\psi = X/L$):

$$a = \frac{\dot{\varphi}}{\varphi} - \frac{\dot{\psi}}{\psi}.$$

Such this difference represents the acceleration of the input of science-and technology potential in the development of a national economy 'a', defined by equating the costs of labor time in hours, days, years 'L'. Accordingly, the overall potential of science-and-technology innovations in the aggregate expression 'P' is defined by the product of the total labor time 'L' and the indicator a of the acceleration of economic growth: $P = L \times a$.

Such effect is defined by the difference between the three growth rates of the varying indicators of the development of the national economy. If the input of science-and-technology potential of the country was previously defined in obscure terms, a scaling effect or a Solow residual now enables an accurate assessment by employing the cost of the actually utilized labor time in production, labor productivity, capital profitability, and the coefficient of the science-and-technology potential. Additionally, each entrepreneur may readily perform formulae-derived calculations corresponding to types of his/her economic activities.

10. CONVERT THE SCIENCE AND TECHNOLOGY EFFECT IN ITS LABOR FORM TO ITS ENERGY COMPONENTS

The measurement '$P = L \times a$', which represents the product of the number of people employed in an economy 'L' and the indicator of the acceleration 'a', may also be considered as the capacities in the energy units. According to the FAO data, an average person needs a minimum 1,800 kcal (7,500 kilojoules) per day.

Each country has its own conversion coefficients on the efficiency of labor time in energy unit, which takes into account of climatic conditions of living in the country, the type of economic activities the citizens are engaged in, ages, genders, etc. Example, in the UK, an average aged female would consume 2,200 kcal per day, a man 2,500 kcal. It adds up to 2,350 kcal per day, on average. These indicators in the USA would be: female 2,200 kcal, man 2,700 kcal, which adds up to 2,400-2,500 kcal per day on average.

The energy formula used to define the science-and-technology potential becomes clear and comparable with formulae on measuring based on the thermodynamics theory and relativity theories. Those measurements with the above-noted impacts in money, labor time, and energy units, turn out to be authentic with each other. They clearly define the level of the development of the production forces and that of capital.

Assessment of the energy impact, as well as that of money and labor, is defined by comparing the growth rates of key indicators of the macroeconomic dynamics, capital in its money form, and capital in its commodity form. The formula for the energy efficiency of innovations in the production and in the innovations technology is measured by

$$P = L \times a,$$

where 'P' stands for the energy impact measured in kcal, kilojoules, кWт, and 'L' the number of people employed in the economy, also measured in (kcal, kilojoules, кWт), and the indicator 'a' the acceleration, defined as the difference between labor productivity and capital measured by the final product, and labor productivity as well as capital profitability measured by costs of the gross product.

The unit of the indicator of acceleration is the relative measurement defined as the difference between the three productivities measured by their growth rates.

The novice of the present research is in its ability to enable the measurement $\dot{c}/\mathrm{c}$ to be interpreted as the net input of the science-and-technology potential of the economy, in developing the formula where labor time utilized for the production of product (Y) and of goods and services (X) enables the measurement $\dot{c}/\mathrm{c}$ to be considered as a net contribution of the science-and-technology potential in the economy, which in turn is defined as the difference between the marginal labor productivity in the final product and the marginal labor productivity in the aggregate costs of production.

The afore-described formula may serve as a solution to the Granberg puzzle. Such solution has been obtained by science-driven measurment of inputs and outcomes.

In measuring the macroeconomic dynamics, if the indicators of one of the three-component dimensions, either capital in its money form or capital in its commodity form, are missing, the resolving the Granberg puzzle will become impossible. An application of the full, three-component matrix of the intra-industries input-output tables is the necessary prerequisite for solving the Granberg puzzle.

No doubt, not always, the science-and-technology potential of a country yields positive impact. It is because not every investment can ensure sustainable enterprisers' profits evenly across all industries. In this regard, the negative surplus profit is often being registered at the national economy level. Moreover, not always, the invested capital works at its maximum capacity, and often the expected impact proves to be nil. In order to avoid such unexpected

outcomes, the assessment of the input of the science-and-technology potential into an economy at the country level is needed.

The cycles theory versus the contract theory: The literature suggests the following three approaches that are applicable in explaining natural cycles.

a) A cycle is a phenomenon that is external to the economic system; and its evolution is influenced by noneconomic factors. Such factors may be solar radiation, political shake-ups, revolutions, demographic booms, inventions and innovations, influencing the economic and environmental milieu for production processes;
b) A cycle is an internal phenomenon, driven by causes endogenous to the economic system, initiated by the self-reproduction of economic cycles, such as demand and benefits, consumption and investments; and
c) A cycle is a multispectral phenomenon, driven by a synthesis of both internal and external factors that occasionally but sustainably impact the economic system.

According to American researchers, 1,380 types of economic cycles have been identified. The duration of these cycles vary from 20 to 700 years (Klinov, et al., 1989, p. 7). From the practical point of view, there exist different classifications of cycles. The following two criteria are given in the core of the above-referred classification: (1) the duration of cycles; and (2) the driving forces of cycles. According to the first criterion, we suggest the following classifications:

1) Seasonal cycles with the duration of one week to several months;
2) Business cycles with the duration of one to several years;
3) The Kitchin cycles with the duration of 3 to 5 years;
4) The Jugular cycles with the duration of 7 to 11 years;
5) The Kuznets cycles with the duration of up to 20 years, and
6) The Kondratiev cycles with the duration of 40 to 60 years.

The driving forces of business cycles are primarily linked to investment activities. The mechanism underneath the market dynamics is vested on principles of acceleration and multiplier effects. The principle of acceleration suggests that the scale of investments depends on the increment and changes in the demand versus the final product. Business cycles have well been studied in the western economic science, for details please consult with the works by P. Samuelson, J. Hicks, and others.

Short-term cycles with the duration of 3 to 5 years evolve out of the dynamics proportionate to the size of the reserves, which consist of materials and commodities stocked by firms. They have been named in honor of D. Kitchin, an English researcher who first stidied how business cycles work. He particularly noted: “First, they emerge as outcomes of investing in materials, raw resources, and stock capital in an intention to make the best use of the market demand. Gradually, the demand wanes off, and capital, invested in stocks, becomes excessive. Stock investments sharply diminish in size, and the balance between stocks and demand slowly restores. Thus, the cycle helps restore the market equilibrium of supply and demand" (Menshikov, 1989).

Mid-term cycles, also known as industrial cycles, having the duration of 7 to 11 years, are related to renewal of fixed assets, i.e. inventory, equipment, facilities, cars. The life cycle of those assets depend on the extent of their wear and tear, while the latter defines the factual duration of the mid-term cycle. The important role in sustaining the cycles of this type is played by the scientific-technical progress.

Along similar lines, other types of mid-term cycles evolve as outcomes of mass revolutionary innovational technologies. Those cycles are transmitted from one industry to another across the entire chain of industries in a domino effect, thereby completely changing the very foundation of the production (Klinov, et al., 1989, p. 26).

S. Kuznets developed the construction cycles theory for the cycles lasting 15 - 20 years. These cycles are linked to periodical mass renewals in housing and dwellings. Y. Rostow, H. Biskhar, A. Kleinknekht, among others consider the Kuznets cycles as specific characteristics of the American economy only because they reflect huge migrants' inflows and their construction-related activities.

The super cycles theory or K-waves, established by Kondratiev (1989), is one of the most promising directions in exploring long-term tendencies in the development of world economy. This area, by some reasons, has remained a less investigated domain compared to short-term and mid-term cycles. Even so, the practical interest has gravitated towards the study of long-term changes in an economy since relatively recent past. Of interest is also the account of managing the processes of production and sales of produce. Such tendencies, often repetitive in nature, are clearly subjective. However, the lengthier is the tendency the slower is the process of accumulating statistical data and information required for uncovering and investigation of such tendencies.

The economic policies that are currently adopted in developing countries are mainly designed on the bases on the monetarist's concepts that are strictly aligned with the requirements of international monetary institutions and organizations. They, however, might lead to continual stagnation of developing economies and ineffective utilization of economic potential of these countries. Based on the afore-discussed observations, equipped with the common aim of painlessly overcoming economic hardships imposed by a series of economic and financial crises in order to create prerequisites for the subsequent more sustainable economic growth of developing countries, a timely and effective change of the models of economic development for developing countries is much needed.

In this regard, this paper specifically recommends to replace the monetarists-developed model for regulating economies by geopolitical model, which is primarily oriented at developing the function of the science-and-technology potential (STP) of a developing economy. If such model is accepted, the main indicators of the STP may objectively signal about the accumulation of negative consequences of any given economic policy in a developing country, undertaken at any given time interval, and identify the need to make remedial corrections in order to prevent an economic decline.

The growth rate of labor productivity in terms of the cost of the final product $a_1 = \dot{\varphi}/\varphi$ and the growth rate of labor productivity increments in relation to the aggregate cost of productizing the final product $a_2 = \dot{\psi}/\psi$ may serve as the key indicators of the STP.

The need for proceeding with active research in this direction is acute with the reasons listed below: The more is explored in the area of cyclical economic dynamics, the more accurate shall market economic forecasts be, and the more effective shall the impact of state be on the given economy. With appropriate knowledge in this research direction the governments of developing countries will be able to timely implement required economic policies in order to remove inefficiencies and work out action-based implementation plans, inclusive of investment, financial, credit, tax policies, as relevant.

Such sets of measures will help reduce negative and disastrous consequences of global economic and financial crises, and smooth out at least some of the cyclical nature of economic development. Improving the pace of economic development towards its balanced and thus sustainable growth will ensure favorable conditions of the long-term prospective development and provide increasing rates of economic growth, which thereby improves the quality of life styles and wealth of people from around the world.

As the main set of variations in assessing the short-, mid-, and long-term perspectives of economic growth, the growth model with Kazakhstan's regional specificities is suggested in this paper to be used as a pattern. The main criterion, which serves as the basis for replacing

one model by another is the economy's potential of ascending economic growth. It may be defined, according to equ. (14), as follows:

$$a = a_1 - a_2.$$

Indeed, the development of market-driven forces of certain sectors of a developing economy does not underscore essential and insignificant deviations in the growth rate of another economy of either developed and developing countries. However, the contract theory, as a reflection of economic laws, enables one to timely react to such deviations not only at the macroeconomic level, but also at the level of individual firms, be they small or medium sized. The point is that the dynamics of proportions between the annual cost of the final product (Y) to that of the commodities of intermediate consumption (QP) that have been utilized in the process of producing the output represents the productivity of commodities of intermediate consumption in terms of the final product. If this indicator is denoted by 'μ', we then obtain the following function of time:

$$\mu(t) = Y(t)/QP(t) \neq 0.$$

The system of national accounts of world countries reflects the costs of final product (Y) as well as of intermediate consumption (QP). In other words, both these indicators are known for calculations. That means that one can easily derive the dynamics of change in the productivity of commodities of intermediate consumption by using the final product.

Analyses of economies of both developed and developing countries reveal the fact that this particular function $\mu(t)$ complies with the definition given by Michael Porter in terms of the productivity of the materials resources[3]. It defines the cyclical nature of the economic development of national economies of the world as well as the duration of the cycle, and also, the driving forces of the cycle, which are defined by the input of the STP in the overall economic growth rate. Thus, in an ideal case, possible values of the productivity of intermediate consumption goods in terms of the final product, μ, are positioned within the range from 0.1 to 9.0. In a concrete case, one may define equations as functions of time, and identify the form of possible deviations.

11. GROWTH RATE OF STP AS A FUNCTION OF THE PRODUCTIVITY OF INTERMEDIATE CONSUMPTION GOODS

What is surprising is the fact that the growth rate of the STP, which is the coefficient 'c', is a function of the productivity of the intermediate consumption goods (μ):

$$\mathrm{c} = \frac{\mu}{\mu+1}.$$

which can be rewritten as follows: $c - 1 = -\frac{1}{1+\mu}$.

If we let $k = -1$, $\mathrm{x} = 1 + \mu$, and $\mathrm{y} = \mathrm{c} - 1$, then the function of the STP takes the standard form of $\mathrm{y} = k/x$. In this particular case, the equation, involving the STP may be expressed as follows: $\mathrm{y} = -1/\mathrm{x}$. To chart of the function of the STP, which is equal to $\mathrm{y} = -1/\mathrm{x}$, we may involve the range of indicators of the independent variable 'x' and then derive from $\mathrm{y} = -1/\mathrm{x}$ the relevant values of the dependent variable 'y'.

[3]It is Michael Porter who introduced the term 'productivity of resources', of which the reverse meaning defines the efficiency of production resources. Special attention needs to be paid to the shift of 'the focus from low wages to the overall low costs' as the most important factor of the 'development of strong local competition' along the path of 'moving towards the developed economy'. Porter, M. E. (2002). *On Competition*. In Russian. M: Williams Publishing House. St. Petersburg, Moscow, Kiev. (p.496), (p.220).

By using $x = 1 + \mu$, $y = -1/x$, and $c = \mu/(\mu + 1)$, we can construct the following table by deriving the values of productivity of intermediate consumption goods from final product 'μ' within the range from 0.1 to 9.0:

Table 1. The STP Function

μ	x	y	c	μ	x	y	c
0.45	1.45	-0.69	0.31	3.60	4.60	-0.22	0.78
0.50	1.50	-0.67	0.33	4.10	5.10	-0.20	0.80
0.55	1.55	-0.65	0.35	4.60	5.60	-0.18	0.82
0.60	1.60	-0.63	0.38	5.10	6.10	-0.16	0.84
0.65	1.65	-0.61	0.39	5.60	6.60	-0.15	0.85
0.10	1.10	-0.91	0.09	6.10	7.10	-0.14	0.86
0.60	1.60	-0.63	0.38	6.60	7.60	-0.13	0.87
1.10	2.10	-0.48	0.52	7.10	8.10	-0.12	0.88
1.60	2.60	-0.38	0.62	7.60	8.60	-0.12	0.88
2.10	3.10	-0.32	0.68	8.10	9.10	-0.11	0.89
2.60	3.60	-0.28	0.72	8.60	9.60	-0.10	0.90
3.10	4.10	-0.24	0.76	9.10	10.10	-0.10	0.90

As a result, the STP function has been derived from intermediate consumption goods $c = \mu/(1 + \mu)$, which, by the nature of changes, is fully dependent on the productivity of intermediate consumption goods. Figure 1 showed the three instances of development of the STP. In the first instance, the STP function $c = \mu/(\mu + 1)$ has been reflected at the background of the growth rate of productivity of intermediate consumption goods μ (function 1a), which acquires values from 0.10 to 9.0 and shows the ascending trend. This curve is shown in diamond symbols in Figure 1.

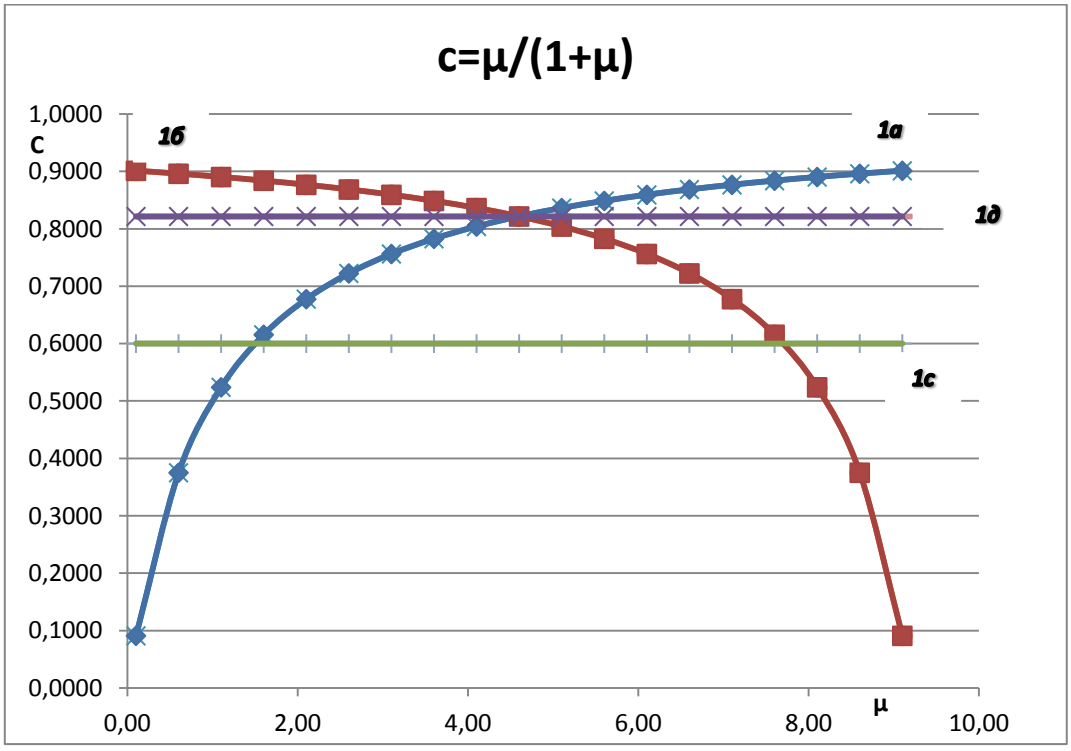

Fig. 1. The function of the STP and Intermediate Consumption Goods

In the second instance, when the function of the STP $c = \mu/(\mu + 1)$, given that the growth rate of productivity of intermediate consumption goods 'μ' (curve 1б) acquires values

from 2.0 to 9.0, we assume, has the descending trend, which at point $\mu = 2.0$, acquires the value of 0.89 and, at point $\mu = 9.0$ equals 0.07. This trend has been shown in square symbols in function 1б.

Three more possible instances, as reflected in Figure 1, have been shown by direct lines that are parallel to the axis of the productivity of intermediate consumption goods μ. The first of them characterizes the real time situation in the developing market given that the STP coefficient remains stable (curve 1c). Thus, Figure 1 reflects the individual case that $c = 0.6$ for any μ. The second trend line parallel to the axis of the productivity of interdemediate consumption goods transcends the points of intersection of both curves (for details, see function 1d). Above this trend line, a set of the indicators of balanced economic growth of different countries has been reflected.

As per the trajectory of changes in the productivity of interdemiate consumption goods (μ), as derived from the cost of the final product, it may serve as a forecast indicator for the analysis of causes of distortions in any economy, since the STP growth rate is defined depending on the dynamics of the changes in the productivity of intermediate consumption goods.

12. SOME FINAL REMARKS

Generally speaking, the results of recent economic discussions are mostly derived out of either Keynesian type models or monetary-policy type models, developed respectively by the followers of these respective schools. Although the thoughts of these schools are still used in the practical management of the world's economies, many of their results are not consistent with the modern realities of the globalizing economy. As a matter of fact, both of these types of models are special cases of our generalized model of market equilibrium, developed on the basic ideological positions of the "Fifth Way", proposed by Nursultan Nazarbayev, the President of Kazakhstan.

Even so, this does not means that the theories of these schools should be sent to the archive of the theories on economic growth and equilibrium. In particular, Keynesian type models are more in line with the economic interests of development of real economic sectors so that they can continue to provide service as the theoretical basis for relevant decision makings. And the models of monetary-policy type can continue to serve the economic interests of developing the financial sector.

Since our generalized model proposed in this paper is obtained by integrating three different market equilibrium indicators used in the Keynesian type and monetary-policy type models, it is expected that this new model can help harmonize relevant economic interests and therefore acts as an instrument to ensure the implementation of regulatory policies.

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