

# The human dimension in the economy and evaluation of contribution of innovation factors in the economy

Sailau Baizakov<sup>1</sup>, Aida Sagintayeva<sup>2</sup>

Centre for Educational Policy, Nazarbayev University

**Abstract.** The article examines the issues of comparing prices of goods and services in the real sector and the value of national currency in the financial sector. As a measuring unit of purchasing power of money it is proposed to consider the total factor labour productivity and capital. And economic productivity of labour is recommended as a criterion for management of general equilibrium of the output levels, employment, income and economic performance. Such an economic productivity of labour is defined as the ratio of total factor labour productivity and capital to the salary of one employee in the economy per unit of labor time. In this case, one hour of productivity of employed people engaged in the economy, armed with a certain amount of equity capital will become the income national currency.

**Keywords:** economy, investments, innovations, development, GDP, growth, human dimension, the United States, Kazakhstan

## 1. Introduction

After the financial crisis of 2007-2010 most economists and financiers came to the conclusion that the human dimension of key indicators of macroeconomics and microeconomics is essential. Indeed, in order for the key performance indicators of the market forces equilibrium to reflect the contribution of all the developmental factors of the real economy and the economy of finance, new methods of measurement are necessary. We want to argue that the evaluation of actual impact of investments and their innovative components of knowledge economy including the educational system on the growth rate of national economy and labour productivity growth should be emphasized. This report identifies the boundaries of the whole system of key indicators that are needed for the study and evaluation of intellectual level and professional skills of employed people in the economy. The best practices of industrialized countries refer to the connection between the national economy and the system of indicators managing the development of the education and science sector, educational policy formation on the whole. This is explained by the fact that education and science have a direct impact on the development of market forces in the real economy. But it is also true that the level of funding for education and science sector is determined by the dynamics of growth of GDP per capita. Primary education, institutions of secondary and special education, as well as higher education institutions, graduate and doctoral programs, including facilities for training and retraining of professional staff is determined by the principle of allocating funds for their development.

In general, we can not ignore the direct and inverse relationship between economic growth and intellectual level of human development.

Economic growth, in accordance with the methodology of the index of human development of UN institutes, is a widely accepted goal of economic development of any economy in the world. Increased production of GDP relative to the population means increasing the standard of living of the local population. The growing dynamics of GDP per capita can better meet people's needs and socio-economic development.

Thus, for the United States with their current level of real GDP of almost 15 trillion dollars, the difference between the growth rate in only one per cent expressed as a sum of about \$ 150 billion per year, equivalent to the annual GDP in Kazakhstan. A removal of the gap between nominal and real GDP in

Kazakhstan can simultaneously increase the national income to 10% per year, equivalent to annual growth of its economy in 2000 and 2005.

The economic growth of any country is determined by the relations of production, firstly, between available local natural resources and economically active segments of the adult population. Secondly, a country's economic growth is affected by developed and industrialized countries. These two production-economic relations together determine the comparative competitive advantages of market forces of the real and financial sectors of national economies around the world.

It should be noted that the relationship between available local natural resources and economically active segments of the adult population of market forces determine the level of the real sector as the basis of the national economy. Relations developing in the course of the production, distribution and sharing of income and resources between economically active segments of the adult population determine the level of market forces, monetary and financial system. The gap between the development of market forces, the real sector and the development of monetary and financial system is now becoming a reality.

The market forces of the real economy sector as the basis of national economy is related to the availability of the following resources in the country:

- potential of local natural resources
- potential of labour resources
- potential of main capacities and resources enabling the expansion of reproduction process
- scientific and technological potential and knowledge economy potential

These growth factors in the literature are called traditional factors of aggregate supply, which are coupled with the factors of aggregate demand.

The efficiency of a market economy are determined by the quality management market equilibrium levels of production of the real product, employment, real income of labor and capital in the real sector and prices of goods and services on the reproduction of intermediate and final consumption, while maintaining the purchasing power of local, national currencies and other funds.

Thus, the factors of supply and demand are closely linked to the overall balance in the economy and the sustainability of economic development and growth rates of GDP and GDP per capita. The low level of employment of labor along with other factors of production such as low levels of scientific and technological capability can significantly slow down the pace of economic growth. A slowdown in GDP growth per capita could significantly slow the growth of spending on education, research and development, as well as higher investment rates. A low growth of the latter factor may cause a decline in employment in the economy. So, in terms of innovative economic development increases the organization's role and tools of economic management. Therefore, the role of organization and economic management tools is very significant in terms of innovative economic development.

To achieve a high level of production of real GDP and GDP per capita, the economy should not only provide the desired level of employment and human resources to achieve high aggregate productivity of labor and capital, but a high level of productivity in economic management and measurement in economics is also essential.

By the term of dimension in the economy, we henceforth understand the human dimension of all the key indicators of the real economy and the purchasing power of national currencies and productivity of labour remuneration per one working hour with the consideration of its capacity of capital stock while maintaining the purchasing power of money in the base period.

The following example is instructive about the importance of the human dimension of efficiency and competitiveness of the economy and their proper evaluation, depending on the level of total factor productivity in the economy. Thus, in the early 90s of the last century a member of the Japanese Government expressed their reproaches to American workers, calling them "lazy and unproductive". These arguments were due to the fact that the company can make a Honda Civic automobile at a cost of 10.9 hours of labor while for the production of the car brand Ford Escort the U.S. corporation requires 16 hours. But American managers managed to calm their shareholders that the average rate of pay (including all fringe benefits) the

American workers in this industry is about \$ 16 per hour, while the same figure in Japan is 18 dollars per hour [1, p. 190].

By calculating the ratio at the beginning of the performance of manual work  $\varphi$  and then the economic performance of labor -  $q$  between the two countries, we see that the return on unit wage to 1.25 times is higher in Japan than the U.S. This suggests that the Japanese consider not only the physical performance, but also economic work.

Compatibility of the three productivity indicators: a) intermediate resources b) physical and c) economic work can not be detected by any other instruments, except those which are built on a scientific basis of the dynamic duality theory and methods of measuring prices on human resources, capital and intermediate resources. It is by the means of three productivity indicators, capital and intermediate resources, structural changes in the value of money are detected, which are influenced by scientific and technological progress and knowledge development.

Physical labor productivity is determined by factors such as technological progress, capital-labor (the amount of capital stock available for employment equity), the quality of the workforce and the efficient allocation and mix of resources and quality management.

The limitation of GDP as an indicator of economic growth is that it does not affect those costs that are latent and unable to reflect the money demand and money supply. In this regard, the problem of market pricing and the associated development of the full costs of production has been studied in more detail. A complete set of key indicators of national economy management in Kazakhstan are based on duality theory and the principle of reversibility of prices of goods and services on the one hand and on prices of inputs of intermediate consumption, labor and capital stock. Control mechanisms of such industry sectors as education and health are also based on the aforementioned indicators.

Due to the completeness of the analysis tools and a set of indicators Kazakhstan has prepared a draft navigation system of economic management to assess the contribution of education and science, and scientific and technological progress as a whole to the industrial - innovation development. Discussing industrialization and innovation development of economy, one must understand the concepts of 'investment' and 'innovation' in the social context of Kazakhstan. The originality of the definition of innovation in Kazakhstan is reflected in the eponymous law that not only highlights the quality advantages of innovation used in practice in comparison with analogous ones, but also indicates the need for economic and public benefit.

Therefore, the concept of innovation is understood as something which is ideological and novel that is suitable for investment in one of the industries (technology or products), or in any other sphere of human activity in order to obtain economic and/or social benefits in the form of profit improvement learning, management, labor and delivery of public services. In this definition, any innovation is the result of investment in human development, or an organized group of people of intellectual labour.

In other words, the innovative development of any economic agent is a process whose medium is an investment: investing - producing - implementing - getting some quality results. It is therefore necessary to define yet another notion of "investment" in accordance with normative - legal base of the country. The Law of the Republic of Kazakhstan on investments specifically states that the investment is "all kinds of property (except for goods intended for personal consumption), including items for the financial leasing based on contract leasing as well as rights on them, invested by the investor to the authorized capital of a legal entity or an increase in fixed assets used for business and entrepreneurship".

The new law of Kazakhstan issued in 2009 "On the government's support of innovation" stresses that the basis for the implementation of innovation is an innovative project, which includes "a set of activities aimed at innovation and investment and is implemented within a certain period of time and have a complete character" [2].

The definition of "innovation project", as referred to in the aforementioned law of the country confirms the need for innovative investment and development in this regard, innovation, which according to the same law is defined as activities aimed at realizing innovative projects.

In accordance with the definitions given above, we can draw the following conclusion: innovation implies novelties which promote scientific and technological progress and/or significantly increase the efficiency of the existing factors of production and bring economic and/or social benefit. Engine of innovation are innovative projects that involves investment of all economic agents, including family household economy. This definition fully complies with the conditions of general equilibrium in a market economy, as well as the purposes and principles of implementation of public support for innovation:

- Development of the innovation potential of the Republic of Kazakhstan
- Increase of the share of high-tech products in the GDP structure;
- Facilitating the transition of the economy of the Republic of Kazakhstan on the path to innovative development based on the introduction and use of high technology.
- Compliance with national interests in the implementation of innovation;
- Equality among parties of innovation activities in obtaining governmental support for innovation
- Comprehensive and systematic approaches to ensuring a constant interaction of parties involved in innovation activities;
- Transparency of procedures for governmental support of innovation

In terms of limited investment resources, there is good reason to analyse and evaluate the implementation of investment projects from the perspectives of availability of innovative components in the form of economic or social benefits.

The grounding for this assessment of economic benefits in terms of money and social benefits should be reflected in the principle of duality introduced by Kantorovich-Koopmans, which can not be implemented either with the help of Keynes' model, nor with a model type of monetarism.

It is therefore proposed to conduct an analysis of innovative projects using the following balanced scorecard based on the human dimension of the key indicators of the economy:

<b>Symbols</b>	<b>Calculation algorithm</b>	<b>Indicator Titles</b>
$\Phi$	$\varphi = \gamma + fr$	Total factor productivity ( $\varphi$ )
$\Gamma$	$\gamma$	Average annual salary ( $\gamma$ )
$Q$	$q = 1 + d = 1 + E \cdot h$	Performance of labour pay units in terms of money ( $q = \varphi / \gamma$ )
$D$	$d = E \cdot h$	Normative profit on capital stock in regard to remuneration ( $d$ )
$r$	$E = r$	Price of capital stock ( $r$ )
$E = r$	$E = TR / K$	Norm of efficiency of capital investments ( $E$ )
$TR$	$TR = d \cdot TW = r \cdot K$	Gross profit ( $TR$ )
$H$	$h = \frac{f}{\gamma}$	Capital endowment of labour unit in terms of money ( $h$ )
$F$	$f = \frac{K}{L}$	Capital endowment in current prices ( $f$ )
$K$	$K$	Main assets of enterprises at current prices ( $K$ )
$L$	$L$	The number of employed persons in business economics ( $L$ )
$X$	$X = TW + TR + QP$	Sales volume ( $X$ )
$GDP$	$GDP = r \cdot K + \gamma \cdot L = TR + TW$	Gross added value GDP(BJIC)
$QP$	$QP = \frac{1}{\mu} \cdot (TW + TR)$	Where $\mu$ denotes performance of intermediate resources of production QP, and is determined by the ratio of GDP / QP
$TW$	$TW = \gamma \cdot L$	Remuneration (average annual salary for the product per employee in business economics at the number of employees) ( $TW$ )

Fig. 1: Balanced scorecard for the analysis of investment projects and their evaluation based on the human dimension of the key indicators of the economy.

The indicator for assessing the innovative components of the project in the scorecard is a price index of capital stock ( $r$ ), which reflects the level of return of investment in fixed assets of funds.

The following is an assessment of the dynamics of the U.S. economy based on actual data within the years of 2000 - 2008 using the same system. The end result of the project is the analysis of excess money supply with an estimate on this basis of the purchasing power of the national currency. For example, calculations performed on the material United States showed that in 2001-2004 the share of real GDP growth at the expense of the U.S. performance of the general fund of working hours rose from 15.3 to 70.5%, but during the period of 2005-2008 it has decreased to 60.8 %.

Resource costs at current prices for the entire analysis period increased by 15.1%. The growth rate of salaries at the same time amounted to 156.5%. This rate was determined by the economic policies adopted by the real sector. It can be represented as the product of productivity growth of the general fund of working time (111%), rising prices for goods and services for final consumption (equal to the GDP deflator, 122.5%) and the actual growth of the index value of resources over the years (115.1 %).

This means that only 19.4% of the increase in remuneration was due to an increase in productivity of the general fund of working time, 44.2% was due to higher prices for goods and services for final consumption, and 36.4% was due to lower returns of fixed assets in the real economy. This version of our calculation is determined by the GDP deflator, announced by the official statistics.

According to our calculations, the sum of costs of money required to implement the adopted policies in the real sector of the U.S. economy at the speed of the actual turnover of the money base period exceeds nominal GDP by 16%, which leads to a depreciation of the US dollar to 86.2 U.S. cents. Taking into account the rise in prices for goods and services for final consumption depreciation of money and the gap between the development of real and financial sectors is 42.1%. The physical equivalent of one U.S. dollar in 2008 contained only 70.4 cents during the base period of 2000.

The same calculations for our alternative model of governance the same general equilibrium levels of output, employment, incomes and prices show that, over the years, the productivity growth of the general fund of working time has increased to 129%.

The growth index of the prices of goods and services for final consumption (equal to the estimated GDP deflator meeting the terms of general equilibrium of levels of production, employment, income and prices) for the period of the analysis dropped to 105.5% against 122.5% according to official statistics. The index of the actual increase in the cost of labor and capital resources in the real economy during the same period is equal to 115.1%, while real growth rate of remuneration remains at the level of 156.5%. The decrease of purchasing power of U.S. dollar to 61 cents became factual in 2008.

The work performed to address this problem based on the example of the U.S. economy showed that it is possible to carry out an analysis of the economic development of any country, wage growth associated with different factors in the framework of the limited set of macroeconomic indicators.

Such high-technology of analytical work and a draft navigation system for managing general equilibrium levels of output, employment, incomes and prices may well serve as a guide for economic policy in any country in the world. The present project used a new principle of reversibility of the key indicators of market prices of goods and services of final and intermediate consumption on the one hand, and the market prices of labor and capital on the other hand.

It is the reversibility theory which has allowed us to focus on one point, a point of consensus core of the world currency. Now it becomes clear why neither the supporters D. E. Stiglitz, nor supporters of R. Mandel cannot agree on the principle of ensuring stability in the global economy and to achieve agreement on the mechanism providing identical equality of a unit capacity of the international currency with its physical equivalent.

The authors of the project, conducting a pilot calculation on a national sample of the U.S. economy, the Customs Union and the economy of Kazakhstan, Belarus and Russia were convinced that the power unit of world currency is stored at the point of international consensus on such an agreement as the gold standard of Bretton Woods or Jamaica agreements. However, a feature of the new agreement in a globalizing world economy is the point that the unit capacity of the global currency purchasing power of each national currency tends to different parties: the currencies of the developed countries mainly seek to balance among the surplus and cheap money, and the currencies of developing countries tend to the excess and low-cost goods and

services as indicated in the figure, which was built according to the U.S. and the Customs Union of Kazakhstan, Belarus and Russia:

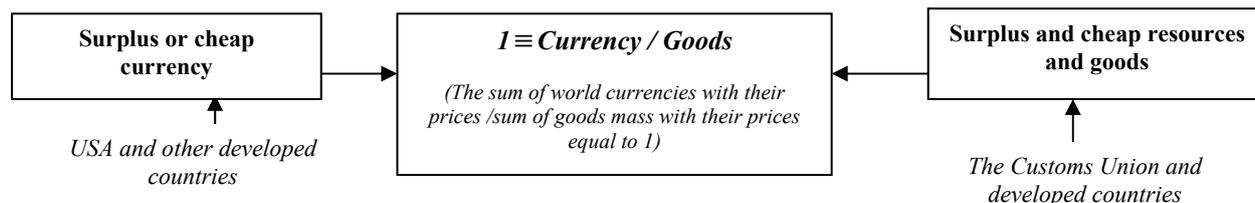


Fig.2: For the UN member-states, interested in receiving data base on their countries

Market power unit capacity of a world currency in the absence of international consensus is able to make its way spontaneously causing imbalances and economic upheavals increasing the gaps "between those who make money and those who do business" (B. Obama).

The proposed project is able to control us in different directions by the real and financial sectors of the market, and even policy-making or planning of the economy, including the level of microeconomics (enterprises, companies and other corporate structures). We proposed the principle of reversibility which is based on the economic legacies of such giants as V. Kautilya, Aristotle, D. Ricardo, Adam Smith, Marx, Keynes, D., Leontiev, V., Kantorovich, V., Koopmans, Ch., Hicks, D. and many other Western and former Soviet representatives of Arts and Sciences. The project's theoretical framework does not contradict any of the contemporary well-known economic ideas of East and West, as it only summarizes and brings them to the application of management tools that have wide practical application.

## 2. References

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