

**INNOVATION ECONOMICS - THE LEADING ECONOMIC
DOCTRINE FOR SCIENCE - TECHNOLOGY TO BECOME
THE DRIVING FORCE OF ECONOMIC DEVELOPMENT
IN THE 21th CENTURY**

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Abstract:

The second half of the 20th century has seen the remarkable contributions of R&D which create the exceptional economic growth of USA, Western Europe, Japan and other new industrialized countries (NIC). The same time, particularly after the world crisis at the end of the century we have seen the great fluctuations of the world economy partially caused by the role of S&T. The dual impacts, positive and negative, of the historical role of S&T in the economic growth of this period are reflected through the evolution of the economic doctrines governing the economic and S&T policies of the world great economies, such as the US one during the late end of the 20th century. Some new economic doctrines emerged, namely the Neo-classical economics, Neo-Keynes economics and, most recently, the Innovation economics. This paper would summarize the main features of the above mentioned economic doctrines and show out the important remarks for Vietnam in application of the approaching concepts by the Innovation economics for our problems of macro-economic policies. Here we will find some “traces’ of the Neo-classical economics and the Neo-Keynes economics very distant from the approaching concepts of the Innovation economics.

1. Neo-classical economics

The Neo-classical economics doctrine including the Conservative Neo-classical economics and the Liberal Neo-classical economics have the concept to give the driving role of growth to the capital and the labor. The market is “the invisible hands”, through the balancing of demand and supply, which govern and guide the society by using the capitals and labor to produce and distribute products. The S&T plays only the exogenous role in this production and distribution process. The S&T is not considered as main variable creating directly the economic growth as the capital and the labor do.

Every economic doctrine has its own “bible“ and the one of the Neo-classical economics is the work by Adam Smith written in 1776 and entitled “*Essay on the nature and origin of national assets*“. The Neo-classical

economics which remains stuck to Washington economists up today has passed many changes from the time the book appeared. Basically, however, the conservative wing and the liberal wing are still based on the concepts and principles established by Adam Smith [1, p.4]. The 5 fundamental principles of Adam Smith are the following.

First, the capital accumulation is the driving force for economic growth.

Robert Solow, MIT economist, gets awarded of the Nobel Prize for his studies to set up the direct links and roles of the capital and the labor in economic growth. In the production function fixed by Solow, the S&T is not the endogenous variable but remains expressed exogenously through technical advances which are the residual part and cannot be explained by the capital and labor factors. Based on the concept of the driving force role of the capital factor in growth, the policies derived from the Neo-classical economics were focused on the saving purpose of individual expenditures and public expenditures in order to increase the capital for investment. The capital invested for infrastructure and for human needs was taken as the only factor to decide the economic growth rate. The neo-classical economists, in general, “*refuse or minimize the role of S&T, even do not trust the role of technological advances*” [1, p. 5]. The R&D activities basically were not the main objectives of policies because they were taken as exogenous elements not involved into the economic growth machine.

Second, the economic growth is due to the maximal efficiency of the distribution of resources.

The investment capital, labor, commodities and services distributed and consumed according to market prices would bring the biggest benefits when there are no economic regulations and policies to distort the market prices. The policies which regulate taxes and public expenditures, and the policies of S&T do not reflect truly the market prices and ensure the efficient distribution of resources. These policies are considered as growth hindering factors.

Third, the focus of the economy is the market and prices.

The neo-classical economist have the almost absolute faith in the role of the self-established market and prices to guide the economy to get the optimal efficiency, as it is observed in mathematics and ideal society, without intervention by the State policies. It is one of the reasons to explain the fact that mathematical models were used usually for economic analysis in the neo-classical approaches. The cultural, social psychological, science-technological factors and, particularly, the institutions (including organizations and policies) cannot replace the market and prices in the regulation of economic growth rhythm and rate).

Fourth, the economy has the tendency to get balanced. According to this principle, the balanced state in economy is the common framework for

structural changes and is taken as unavoidable focal point of demand-supply relations, behavior of production, distribution and consumption based on the market prices which get established by producers and consumers. The role of economic policies is to remove or reduce the economic obstacles to get balanced and to ensure the correct reflection of production costs. Being based on this view the policies which use inefficiently the capital and labor in certain environment and time period are considered as to disturb the economy and impact the macro-economy (including the investment for S&T). By this way there is no justification for them to get priorities for implementation.

Fifth, individuals and companies can maximize their benefits and respond reasonably economic stimulations. According to the neo-classical concepts, individuals and companies, while following their own benefits, would satisfy the public benefits thanks to manipulations by “the invisible hands”. The reason is that the people change their behavior when being stimulated by changes and taxes, in particular. One of the useful tools of the supply driven approaches in the neo-classical policies is to reduce the tax rates imposed to the personal income, savings and high income social layers.

2. Neo-keynes economics

The Keynes economics had appeared during the World’s Great Crisis time, the early years of 30s of the 20th century, which was marked by the publication of the book *Global theory of jobs, incomes and money* by the British economist John Maynard Keynes in 1936. Differently from the Neo-classical economics, the Keynes economics emphasizes the economic intervention and regulation role of the governments through public expenditures to stimulate economic demands and provide laborers with jobs. These moves were believed to cover the role of market elements which were missed in the concepts of the Neo-classical economics and enhance the role of management to maintain business cycles.

“The Keynes economics was accepted and applied largely after the Second World War and remained a popular economic doctrine in the US up to the years of 70s. When the economic crisis occurred early the years of 70s the Conservative wing wanted to replace the Keynes economic concepts by the neo-classical doctrine while the Liberal wing wanted to retain the Keynes economic concepts. A big group of liberal economists wanted to keep the Keynes economic concept while tried to fit the new economic conditions.” [1, p. 10].

The Keynes economics modified to fit the economic context of the after-crisis years of 70s got the name of the Neo-Keynes economics and it remains

popular in the US up to now. Some representatives of this tendency include Institute of Economic Policies, Center of Policies and Economic Researches, Levy Economic Institute, Center of American Advances. The 3 main principles of the Neo-Keynes economics include the followings.

First, the demands are driving forces for economic growth. The argument is that the Neo-Keynes economics considers the demands of commodities and services of businesses while the Government and consumers create the demands for economic growth. The increasing total of these demands, particularly the one of public expenditures by the Government, would be an economic stimulation for increasing social investments. Therefore the Government needs to be proactive to increase the public expenditures and salaries of laborers. It would be a measure to increase the income of laborers and then stimulate the consumption which finally leads to bigger benefits for the national economy.

Second, the faire distribution of assets plays the crucial role in economic growth. In the difficult economic situation, particularly during the economic crisis, the neo-Keynes economists believed that there are little things the Government can do to increase the productivity. Therefore the faire distribution of assets gets important. The policies to cut down taxes imposed to low social layers (then they have more money to spend) get more important for the economic growth than the beneficial tax policies applied to technological renovation and R&D activities.

Third, the management of short term business cycles is the immediate target. Instead of attentions reserved for long term targets, the Neo-Keynes economics is oriented to balance the short term economy to prevent the crisis even for a short term of few years. It is the primary priority of the neo-Keynes economic policies. This concept for short term economic targets does not encourage and give priorities to such investments which would only generate benefits in long term including the ones for technological renovation, education and training.

3. Innovation economics

“If Adam Smith is the Saint of Neo-classical economics and Keynes is the one of the Neo-Keynes economics then Joseph Schumpeter is the God father of the Innovation economics who had written in 1942 his classic work: “*Capitalism, Socialism and Democracy*” [1, p. 12]

In the concepts of J. Schumpeter, not only the capital and the labor or the Government expenditures but the organizational institutions, businessmen and technological renovation locate in the center of the economic activities

and the driving force for growth. He gave the following interpretation of the origin of assets the capitalism produces: *“The crucial point we should keep in mind when talking the capitalism is that we are approaching the evaluative process. ... The basic impulse to establish and secure the operation of the capitalist machine is the appearance of new products, new producing methods, new transport means, new markets and new forms of industrial production organizations the capitalist enterprises created”* [1, p. 4].

Under the domination of the Neo-Keynes economics during the last 40 years the concepts of the Innovation economics have no chances to show itself, up to the recent time. In fact “only within the recent 15 years the theory and model of innovation based economic growth originated from Schumpeter’s theory emerged” [1, p. 12]. “This new economic doctrine gets known under the name of the Innovation economics and it has also some other names such as *“New institutional economics”*, *“New growth economics”*, *“Theory of endogenous growth”*, *“Evolution economics”* and *“Neo-Schumpeter economics”*. The theory had provided a new theoretical concept to interpret and realize the policies to push up the formation and development of the knowledge based economy as we have today” [1, p.14] and [2, p.19]. There are 6 main principles to make up the Innovation economics, namely:

First, the innovation is the driving force to push up the economic growth.

The Innovation economics is different from the Neo-classical economics and the Keynes economics which dominate largely in the US up to recent years. The new economic doctrine does not consider the knowledge and technologies as external components of economic processes. The main driving force to push up the economic growth in the knowledge based economy we have today is not the capital accumulation as fixed in the concepts of the Neo-classical economics but the innovation.

“The main changes in the US economy during the last 15 years occurred not due to the bigger accumulated capitals for investment in bigger steel factories and bigger car building factories but to the innovation activities. The US economy has conducted the implementation of many new technologies, particularly information technologies in a global manner. Naturally this implementation requires the capital but the latter is not the driving force but only short term commodity components” [1, p. 14].

Many economic researchers during the last time, from William Bauman, Brad DeLong to Richard Nelson, demonstrated that *“the neo-classical variables (in the traditional production function they denote the capital and labor) do not explain the differences of productivities between companies”*. Robert Hall and Charles Jones made studies of 127 countries and found that

some countries have a faster development. In fact, “in 1998 the volume produced by one worker from 5 highest productive countries is 31.7 times bigger than one worker from the 5 lowest productive countries does. The reason of this gap comes little from the gap in material capitals and human capitals”. Klenow and Rodriguez-Clare found also that “more than 90% of the difference in the income growth of a worker is decided by the way of capital use while the difference in the financial capital and human capital decides only 9%. [1, p. 15]. Therefore the way of capital use, time distribution (short term, long term), ambiance (domestic, overseas), form of capital (equipment, technologies or human resources) and organization of capital use (funds, policies of support) through the innovation of the policy institutions are the driving forces to create differences in growth and productivity between the countries and their economies.

Second, the main driving force of economic growth is the production efficiency and the adaptation efficiency. While the Neo-classical economics concentrates studies to create the efficient distribution of resources according to which “the societies use rare natural resources to produce valued commodities to different individuals in the society, the Innovation economics mainly looks for the way to increase the production efficiency through the studies of the societies having created new production structures, new products and new business models to produce more assets and increase the life quality” [1, p. 15]. According to the view of the Innovation economics, if even the innovation encouraging policies of the Government distort the market price signals and cause some immediate economic damages they would be accepted because the distribution efficiency is not the main factor to regulate the economic growth in the knowledge based economy of the 21th century.

The adaptation efficiency is another important concept in the Innovation economics. It means the capacity of an economy or an institution to change itself through the application and innovation of technologies to get adapted to the new situation. They are the principles to decide the evolution of an economy, the desires of the whole society to look for new knowledge, accept risks to implement the creative innovations and go beyond the balancing principles of the Neo-classical economics and the short term visions of the Keynes economics. They are also the organizational structures full of creativity and innovation which help a society to find out the existence form to fit the changes of exterior situations. It is not the way individuals or businesses alone respond to the signals of market prices. But more importantly it is the way individuals and businesses interact among themselves while being strongly supported by strong research organizations, public-private interlinked networks, and then the common standards would

decide the production and distribution efficiency in the society instead of the market and prices alone.

Third, the institutions (organizations and policies) for search and diffusion of knowledge are keys for growth. By the neo-classical concepts the market and prices are the central factors in the economic system. These factors regulate and guide producers and consumers to follow the demand-supply rules and by this way they would maximize their benefits as well as make their contribution to the global economic growth. In the optics of the Innovation economics there is no perfect markets and unique market prices to decide the behavior of economic factors. New knowledge, technologies, legal regulations, organizational forms, policies, culture, norms, interlinked networks and market counterparts will decide the efficiency rate of an economy. Therefore, not only responding to signals of market and prices, the economic factors have to look for and apply new knowledge, technologies, adaptation to different cultures, consuming styles and social norms to survive and to create new values for growth.

Fourth, the knowledge based economy has the tendencies to fluctuate rather than to get balanced. The economic balance, according to the concepts of the Innovation economics, can exist only in some markets and certain time moments. Therefore, the maintenance of the balanced state and the macro economic balance are not the supreme objectives. Contrarily, the economic doctrine accepts and encourages to create “the creative destructions” (by J. Schumpeter’s words), temporary and short term unbalances through breaking new technologies, new organizational and economic structures, new interlinked networks which would lead to the situation of mutual competition and cooperation in the orientation to long term objectives.

Fifth, individuals and businesses cannot maximize their benefits reasonably according to the market demand-supply rules. The knowledge based economy, in the optics of the Innovation economics, is always uncertain. It is very difficult, even impossible, for individuals and businesses to make optimal decisions in the uncertain situation being based only of the signals of market and prices. It is also uncertain to ensure individuals and companies to get their own benefits and provide public interests at the same time. The increase of prices for energy and negative externalities of environment get gradually far from the reflection of market prices. Therefore the market and prices cannot be and are not the adequate or, more than that, the only adequate signals which give the background for planning. It is necessary to note that, from the side of positive externalities, it is impossible to list out all the contributions the global Internet brings to the world’s

growth and development during the last decades and in the future if the considerations are based only on the signals from market and prices.

4. Comparison of the neoclassical economics, neo-keynes economics and innovation economics

It is possible to note that, if being based on the role of the market of the Government, the Neo-classical economics and the Keynes economics pay attention only to the market balance, macro-economic balance and macro-economic policies. They may use the monetary tools or fiscal tools for intervention to balance the market, macro-economic structure and demand-supply relation eventually from the side of demand or supply. The long time dominating postulates on the role of market, macro-economic balance and demand-supply balance of these two economic doctrines did not take to account the role of knowledge and technologies in the world’s economic growth in the post-war time up to the years of 70s. From other side, these doctrines which become dogmatic delayed also the creation of institutions and policies for integration and exploitation of new values in economic growth produced from creativity and diffusion of S&T knowledge. The financial, monetary and economic crisis of the world in 1997-1998 times and the recent crisis show well that the problem does not reside in the postulates of the Neo-classical economics which state the violation of the role of market. But, in fact, the international and national financial institutions cannot get adapted to the new situation. According to Robert D. Atkinson and David B. Audretsch, the US experiences show: “entering the 21th century... while the US economy had been changed and shifted basically due technologies, globalization and new model of business, the economic doctrines guiding the way for policy making cannot keep pace and remain in the out-dated concepts, models and theories of the 20th century” [1, p. 1].

Table 1: Comparison of the three economic doctrines popular in the USA and the Innovation economics

Factors	Neo-classical economics		Neo-Keynes economics	Innovation economics
	Conservative (Supply approach)	Liberal (Rubinomics approach)		
Sectors offering economic growth	Supply approach (organizations and individuals)	Supply approach (organizations and individuals)	Demand approach	Supply approach (consuming organizations, businessmen and subjects)
Sources of economic	Capital accumulation	Capital accumulation	Expenditures	Productivity and innovation

growth				
Main objects of policies	Consumers	Consumers	Laborers	All people
Main objectives of economic policies	Growth and management of business cycles	Results and management of business cycles	Faire distribution and management of business cycles	Growth and innovation
Key economic process	Efficient distribution of resources	Efficient distribution of resources	Demand of consumers and jobs	Production efficiency and adaptation efficiency
Main tools	Low taxes and reduced adjustment	Fiscal discipline, adjustment of economic policies	Public expenditures, progressive taxes, intensive adjustment	Taxes and adjusted policies to push up innovation, skill, investment for new equipment, competition and business
Trade theory	Free market to enhance the efficiency of distribution of resources and welfare of consumers	Free market to enhance the efficiency of distribution of resources and welfare of consumers, but Government policies have to cover damages caused by trades	Trade may cause damages to workers and reduce demands of consumers	Trade may turn effective, but basically through competition and absorption of technologies. Most effectively policies should be oriented against speculative deviations to push up local innovation
Organization of Government	Small sized	Concentrated for main functions	Strong and big sized Government	Reshuffle of Government more based on civil society and private-public cooperation
Scope of activities	Various markets	Various markets	Institutions and organizations	Institutions and organizations

Source: (Robert D. ET AL, 2008)

In its nature these doctrines do not pay attention to the role of innovation and technologies in economic growth and development. Therefore, the innovation of international and national financial institutions to fit the business cycles based on knowledge and technologies and various term

(short, middle and long) becomes the urgent requirements. The Innovation economics appeared to provide the adequate solutions for the problems.

Another aspect we should pay attention to when comparing the economic doctrines is the difference of their visions for time, space of interactions and interlinks of economic factors. While the Neo-classical economics and the Keynes economics focus their attention for the role of the market, the State, consumers or laborers, the Innovation economics underlines the importance of both the State and the market. It takes to account also the role of consumers, laborers, NGOs and the whole population for innovation. The combination of short, middle and long term cycles, the State and the civil society have created a larger space and framework for synergic effects of production efficiency and adaptation efficiency to fit the external changes.

5. Lessons and suggestions for Vietnam

Many works of research and experiences of economic policy making in the US and some developed countries during the recent decade demonstrate the short capacities of the Neo-classical economics and the Keynes economics to give interpretations of source of growths and give the framework of innovative policies to meet the requirements of the knowledge based economy in the 21th century.

The recent debates in the US and some developed countries are related to the choice of an economic doctrine in the context of globalization and transfer to the knowledge based economy to face the increasing uncertainties in the 21th century. The actual situation shows that the Innovation economics with its modern concepts and suitable approaches will govern the global innovation system. It gradually becomes the common standards for development of economy, science, technology and innovation in the close future.

Vietnam is passing the transfer process to the market economy and the deeper integration process into the world economic system. The recent macro-economic policies considered correctly oriented make gain certain successes in its economic development. The achieved results, however, are not considered sustainable and the quality of economic growth is not considered high. It is possible to remark that the economic models and policies applied recently in Vietnam are based mainly on the high rate of capital mobilization typical for the Neo-classical economics or the stimulating measures typical for the Keynes economics. The S&T knowledge and innovative sources, namely adaptation capacities for management and policy institutions according to the concepts of the Innovation economics remain outside attention and application. The high economic growth rate in the initial stage is experiencing a slow down

tendency. The most important is the very low ranking of innovation index of Vietnam (ranked 78 among 110 countries in 2009, behind the Philippines ranked 54) [3, p.14].

In order to have a sustainable development and an economy accompanied with high creative and innovative capacities in future for a higher position of Vietnam in the global value chain, Vietnam obviously needs to transfer fast to the models of deep economic development enriched by the mobilization of S&T knowledge. As support for this transition, in addition to the Neo-classical economics and the Keynes economics, the Innovation economics should be studied and applied to set up the new framework for *innovation policies* in a global manner instead of individually set-up policies for economy, finance, budget, industry and S&T in actual practice in Vietnam./.

REFERENCE

1. Robert D. Atkinson, David B. Audretsch. *Economic Doctrines and Policy Differences: Has the Washington Policy Debate Been Asking the Wrong Questions?*; The Information Technology & Innovation Foundation (ITIF), 2008.
2. Kevin Bryant, Alison Wells. *A New Economic Paradigm? Innovation - Based Evolutionary Systems*; Department of Industry, Science and Resources; Canberra ACT, Commonwealth Australia, 1999.
3. Carlos Aquirre B. *SWOT Analysis of the Vietnamese STI System: Trends and Policy Recommendations*, UNIDO, Vienna, 5-2011.
4. Nguyen Manh Quan, *Post-science society and suggestions for Vietnam*, Magazine *Tia Sang*, No. 15, 2010.