

CHALLENGES FOR SCIENCE-TECHNOLOGY DEVELOPMENT FROM ECONOMIC INTEGRATION

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Abstract:

The world economic integration will open the chances of integration for Vietnam to get access to the world's development achievements, promote its specific advantages in the context of globalization. This puts also, from another side, many challenges because the process opens the cooperation accompanied with the tough competition of interests. One of the most hard problems we have to face in the process of international integration include the S&T related challenges.

1. Actually, the international economic integration is, in its nature, the liberalization of activities of trade, finance, investment and etc... with the appearances of interlinks and interdependence of the national economies under general regulating mechanisms. The features of integration are reflected through import-export activities of regular commodities and investment activities in different scales and scopes. *For Vietnam, the international economic integration is a thing strange and complicated at the same time.*

Starting from the fully center controlled economy based on the socialist mutual support and cooperation we are facing the economic integration in the context of globalization. Then we need make clear the interlinks between the international integration and the national sovereignty, economic integration and independence, integration and socialist orientation determination. Like the "Doi Moi", the "Opening and integration" requires the new conceptual background and theoretical systems which permit to combine in maximum the short term and long term interests, global and local interests, economic and socio-political interests. Actually there exist controversial interpretations of the international economic integration which show some shortages in the Vietnamese theoretical interpretation when facing the contemporary changes.

The comprehension and knowledge about other countries have the important meaning for the Vietnamese opening process. The success in the international cooperation depends largely on the way and capacity to identify “partners” and “competitors” in every context and time moment. At the same time the sharpness of this identification depends on the capacity to analyze the policies, potentials and traditions of each country. The studies of Vietnam, however, on other nations remain limited in knowledge, experiences and methods. At the same time other countries, such as the US, France, Japan and etc., pay attention to the Vietnamese studies. Japan has pushed up activities in this field. Only in 1995 Japan had published 24 books on Vietnam. We are facing the disadvantageous situation when “we know others less than they know us” and this threat would put us in disadvantageous position when we face them.

Every country when entering the globalization needs to mobilize efforts to adjust its own policies and regulations in conformity to international rules. The most difficult particularity for Vietnam is that the majority of actual regulations and policies were issued in the time of the center controlled economy which, in fact, do not match the market economy and are very far for application in international integration. More than that the loosen implementation of regulations and policies would lead to the extended practice of imitations, fakes, trade frauds and other negative appearances. It is the urgent field remaining opened and waiting for the solutions from our management science circle.

Another important aspect of the international economic integration is the involvement into the world financial system. This process hides always “trap” for developing countries including Vietnam. In fact, the recent Asian financial crisis show well the unpredicted consequences caused by shortages in international financial knowledge and practice. In order to avoid the similar threats the heavy loads are put on shoulders of our economic scientists (which are considered to have the level lower than the regional one). It is required to study the measures to protect the national monetary system from external attacks, respond quickly to financial and monetary fluctuations, control toughly financial and economic activities, and coordinate effectively financial and monetary policies between the countries in the region.

2. The regional and global economic integration means the acceptance of tough external competition. Our capacities in this field, however, remain very limited. There are some examples:

- In Hochiminh City only 25% of enterprises have the modern technological level, 32% of them have the middle technological level and 43% of them have the lower technological level;
- In Hanoi only 13.5% of machines and equipment are classified relatively modern, 6.06% of them are classified as middle level and 20.5% of them is ranked as outdated;
- A survey by the Ministry of S&T shows the majority of our businesses use out-dated technologies of 2-3 generations behind the world middle level; 80-90% of existing technologies were imported. 76% of imported machines and technological chains are of 1960-1970 generations; 75% of equipment are behind the expiration date; 50% of equipment were upgraded. In global the part of modern equipment makes only 10%, the middle one makes 38% and the remaining 52% is the share of out-dated and very out-dated equipment. Particularly, in the section of small size production the latter makes 70%;
- Another statistic figures show that more than 75% of machines and equipments of Vietnamese enterprises are from the years 60s of the last century where 70% are behind the expiration date and 50% were upgraded;
- A recent survey shows that in the Vietnamese textile sector 45% of machines and equipment require to be upgraded, 30 - 40% requires the replacement. This leads to the poor assortment and low competition capacity of Vietnamese garment products.

In Vietnam the number of enterprises who do investments for scientific research and technological renovation remains very limited. In 2005 the survey among Vietnamese industrial businesses conducted by the General Department of Statistics shows that among 7,580 surveyed industrial businesses only 293 businesses do investments for S&T (including activities of scientific research and technological renovation) which is 2.86% (the figure of the 2002 survey was 6.14%). The shares of sectors are as follows: the State owned enterprises make 181/1227 (14,75%, the figure of 2002 was 16.4%), the non-State owned enterprises make 80/4462 (1.79%, the figure of 2002 was 3.4%), the FDI sector makes 32/1891 (1,69%, the figure of 2002 was 4,9%). There are 185 (2.44%) businesses who make investments for scientific research where 64 are State owned enterprises and 14 are FDI enterprises.

The rate of investments for S&T by enterprises remains also low. The 2005 survey by the General Department of Statistics shows that the total volume of investments for S&T by 293 is VND193.7 billion (divided by 3316 S&T

staffs gives about VND58.4 million). If we take the average volume per laborer of 293 enterprises the volume of investments for S&T is only VND0.74 million/laborer. The figure of manufacturing industry (7.580 enterprises) is only VND0.075 million/laborer. The 2006 survey conducted jointly by UNIDO and Central Institute for Economic Management of 100 enterprises in Hanoi and Hochiminh City shows that the volume of investments for renovation of equipment and technologies makes only 3% of annual revenues. The most recent survey by Swiss Contact (Switzerland) and GTZ (Germany) of 1200 enterprises in Vietnam shows that only about 0.1% of annual revenues of enterprises is reserved for renovation of equipment and technologies. At that time the same figure of India is 5% and the one of South Korea is 10%.

In Vietnam the average investments of enterprises for R&D do not exceed 0.25% of revenue while the figure of industrial countries is 5-6%, the one of developed countries is 10%. In the high tech fields the investment rate for R&D always makes 10-20% of revenue.

The limited competing forces of the Vietnamese economy are related to the poor action from S&T side. It is clear that a higher contribution from S&T is urgently required for enhancement of competing forces of the Vietnamese economy when facing the globalization and regionalization. Then in this step we hit a big obstacle risen up the gap between the capacity of S&T forces and the requirements of innovation of enterprises.

Therefore, *the requirements of enterprises to shorten the gap are the challenge the international economic integration puts to the S&T community.*

3. The world economy is advancing to a new type which is the knowledge based economy. Today we are witnessing the emergence of many knowledge based terms: knowledge-base firms, workers etc... In the USA the GDP share of information technologies (IT) increases strongly from 4.9% in 1985 to 8.2% in 1997. In 1987 one of the biggest companies in the IT field keeps the capital volume of USD12 billion in stock markets which is 50 times bigger within less than 10 years. During the 1970 - 1990 period, the USA created 90% of jobs in the knowledge and information processing services. The IT is the field which has the most increasing number of laborers (118%), information engineers (109%) and system engineers (103%).

Vietnam with its policy of international economic integration should go the way of integration into the knowledge based economy. The knowledge economy is based on new and high tech fields. For example, the main features of technological structures of the knowledge based economy include

IT (15%), bio technologies (about 10%), marine technologies (10%), clean technologies (5%), new material technologies (5%), space technologies (5%), and soft technologies (5%). In this optics Vietnam remains still weak lacks many aspects in the high tech fields¹.

The gap between the actual situation of Vietnam and the level required for the knowledge based economy is really the S&T challenges in its way of international economic integration.

4. Many problems related to S&T had been presented above in connection to the international economic integration. But they are not all yet. The challenges are hidden more deeply, namely in the low awareness of the S&T role, limited number of S&T staffs, inefficient S&T management mechanisms, unreasonable S&T structure. These deeper aspects should make emerge some threats we need take to account.

The process to change the thinking way, upgrade the qualification, renovate mechanisms, adjust S&T systems are long lasting and complicated. The renovation process of S&T management mechanisms (started in 1981 by Decision No. 175/CP) lasts for more than 20 years but many of out-dated practices still remain, namely the center controlled and subsidized mechanism remains popular in the S&T management system, S&T management structure remains cumbersome and overlapping, set-up and implementation of S&T research programs are far from real requirements of the life, etc. It seems that we lack the capacity to establish the breaking-through steps and this lack makes the main obstacle to our efforts to push up the innovation process. If we cannot get out from this situation of stagnation ***the S&T of Vietnam remains facing the threat of lagging behind other countries in the world and in the region.***

The integration tendency opens the chances for Vietnam to select and apply many S&T advances of the world. The selection and application, however, of external S&T advances are usually based on certain capacities of technological assessment and evaluation, namely the capacity to identify the various components of these technologies. It relates to the sophisticated and modern level of technologies, capacities of technologies to meet local requirements of production activities, life cycles of technologies, socio-economic-environment consequences of technologies and etc. The lack of the capacities to assess and evaluate technologies together with simple and dogmatic concepts of the S&T role lead to the needs to import many technologies which cause negative consequences.

¹ For more details, refer to the documents related to the S&T strategies and development of sectors which serve as background for the Project "Vietnam S&T development strategies up to 2010".

It is possible to consider these performances as signals of ***threats to make Vietnam the rubbish dump of technologies of the world and make us dogmatically dependent of technologies.***

Practically the import of technologies has the immediate purpose to cover the lack of the domestic S&T system. In long term vision, however, this would lead to dependent relations of technological advanced countries. Without capacities to keep the key know-how the technology importing countries will fall in the manipulation of external factors and then they will get technologically dependent. When we use big loans to buy technologies without producing export products afterwards to get back cash for repayment we will get financially dependent. The analysis of the recent Asian economic crisis shows well some reasons coming from the extended and unjustified import of technologies. The import of technologies requires compulsorily the loans of capital accompanied with imposed expensive purchases of machines and equipment. In addition, the products they can give are low in value and competing forces. In this situation the technology selling countries get huge benefits while technology importing countries become heavy debtors.

In order to mitigate gradually the impacts from external dependence the key to solutions is to enhance the endogenous capacities to absorb, master, improve and develop imported technologies. Thanks to the promotion of creative imitation capacities (creation of commercial technologies and integrating technologies) Japan had get out from the heavy situation of technological dependence and it declared the technological independence by 1980. China, with its persistent investment for fundamental researches, has mastered well imported technologies and then improved and developed them. Here is a typical example of China: first it paid more than 1 billion USD to import an oil refinery plant and, during the operation, it improved, increased gradually the production and then design-manufacture-install-supply oil refinery plants with higher capacity and 2-3 times lower costs.

Actually we are expecting much to gain from the world S&T advances. Our capacity, however, to absorb and modify the imported technologies remains basically very weak. In the 7 stage evaluation scale of the global technological development², in general, Vietnam locates somewhere in the first or second stages. From other side we are experiencing a negligence of fundamental sciences and therefore these fields remain in the critical

² Stage 1: Import of technologies to satisfy minimal needs; Stage 2: Organization of minimal infrastructure to absorb imported technologies; Stage 3: Creation of external sources of technologies through assembling operations - SKD, CKD, IKD; Stage 4: Development of technologies based on licensing; Stage 5: Renovation of technologies based on R&D and adaptation of imported technologies; Stage 6: Export of technologies based on R&D; Stage 7: Continued renovation of technologies based on high investment and fundamental researches.

situation since 1986 including the shift of scientific staffs to other activities, low experiences in fundamental scientific researches, low rate of enrollment of students for fundamental sciences and etc. There are not only limitations in the capacities to make good use of imported technologies but there are also shortages in the S&T management system including guiding activities and supporting services, control of search and importation of technologies. All of these lead to ***the increasing threats of dependence from external technologies.***

5. The process of international S&T integration of Vietnam has been conducted in many aspects, namely extension of international S&T relations, promotion of technology transfer activities, issue of guiding regulations and legal documents in conformity to international practice and etc. The integration, however, relates not only to the attitude of opening and the desire to set up the relations with the external world but, more important, it is the actions to approach the world's S&T level and set up the internal structures compatible to the development trends of the world. It means, in fact, to state which world we want to integrate into.

The most remarkable trend of the actual world is the innovation wave in many S&T fields. Many breaking-through achievements emerge in software technologies, computer technologies, communication, artificial intelligence and etc. This trend is observed also in high tech fields. All of them will change fast products, push up the competition and cooperation in R&D activities.

Another remarkable trend is to link closely S&T activities with economic targets, research activities with production process. The links between research activities and production process should locate in the innovation context of enterprises. In addition to the market channels which link the research activities with production activities there exist other possibilities to set up the direct participation of researchers in production and business organizations. The shorter path from research activities to production process is related to the change in the procedure of application of research results. This link gets more extended at the present time, namely the universities provide not only the human resources and the research institutes provide not only created technologies but both of them get involved into the direct services of R&D, consulting and training activities.

The new context requires the new capacities of scientists to implement the links between research and business activities. The scientists should find their location in the integrated research-production cycles (including fundamental research, application research, development of technologies and production). Different activities are conducted in continued and integrated

manner and in many cases there are no clear borders between them. Business modes are integrated with research activities in the total cultural and working platform of organizations and scientists. Particularly it is possible to have scientists with spirits of entrepreneur ready to participate directly in production process to develop results of their research activities. These people, from one side, know to develop scientific ideas and, from another side, know to get benefits from market activities. And the scientists, under organizational control of businesses, should adapt to the new relation, namely they move from the independent position of providers to the subordinate position of staffs, from the freedom of publication of their research results to the restriction of benefits based use of them (because it is businesses who make investments for research).

Businesses found in the binding links with scientists pass also the deep changes. Businessmen have two problems which seem to be contradictory. From one side they must produce newer products on basis of modern technologies and from other side they must cut down the costs to produce products and the time to bring them to market. The first problem requires them to have access to leading S&T organizations, conduct research activities full of imagination and create the environment favorable for creative innovation. The second problem requires them to focus attention on short term production plans, stick on actual fluctuation of situation and settle concrete technical troubles. The investment for R&D is capital consuming and the R&D activities are also important components of businesses. The businesses have to restructure to accommodate the R&D divisions with the remaining divisions, particularly the marketing division. The measures to reduce the distances between divisions would simulate the coordination between them in their projects. Businesses have also been promoted their links with other research organizations in the framework of the national innovation system (NIS). Recently a new type of businesses appeared, namely the businesses of scientific research. Their purpose is to make business on basis of immediate application of fundamental researches. It is a way, shorter and cheaper than the traditional businesses, to turn technologies to commercial products.

The above presented tendencies permit to unify the economic integration, S&T integration and their development. If this concept is not used as tool for evaluation it is clear that our capacities of integration remain very limited.

Long years ago Karl Marx had noted that the history puts down only the problems to resolve when the historical development itself contains already the preconditions for their solution. Now we believe that we have opportunities behind the challenges and threats to overcome them. In fact,

this faith is reflected in many recent documents of the Party and the State. Naturally there is no hope to settle the problems only by the faith expressed in a single document. Therefore it is required to mobilize efforts to bring the spirits of the Innovation and Development into life, and overcome the challenges and threats in the process of international economic integration./.

REFERENCE

1. Magazine *Japanese Studies*, March 1996, p. 56.
2. S&T Department of Hochiminh City. *Project for renovation of industrial technologies for shift of industrial structure in the city*. Hochiminh City, March 2008.
3. Ho Chi Minh National Academy of Politics and Public Administration. *Final report of the ministerial project, 2007 year: Enhancement of the State administration role for development of private economic sector in Hanoi*. Hanoi, 2008, p. 60.
4. Nguyen Minh Bang. *Quality based competition - trend of sustainable development*. Magazine Scientific Activities, No. 2, 2007.
5. Pham Chi Trung. *Promotion of Research and Development - crucial element of Vietnamese businesses in the process of integration*. Magazine Scientific Activities, No. 2, 2007.
6. Mai Thi Anh Tuyet. *On the innovation in businesses*. Magazine Scientific Activities, No. 5, 2008.
7. Magazine *UNESCO Herald*, December 1998, p. 6 - 7.
8. Magazine *Science-Technique-Economics*. (In Vietnamese). September 1996, p. 24.
9. Ngo Quy Tung. *Knowledge economy*. Beijing: Science and Techniques Publishing House, 1998.
10. Workshop Proceeding. *Application of knowledge for development in Vietnam*. Hanoi: Culture and Information Publishing House, 2001, p. 124.