

## **EXPLOITATION OF INVENTIONS IN COMPETITIVE ADVANTAGEOUS PRODUCING SECTORS: ACTUAL STATUS AND POLICY SOLUTIONS**

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### **Abstract:**

*Exploitation of inventions plays important roles for sustainable development of enterprises, particularly in those sectors which hold competitive advantages. In Vietnam, activities of exploitation of inventions among enterprises in recent times remain limited and existing policies do not really stimulate enterprises to promote application and exploitation of inventions. These limited actions cause considerable negative impacts to creation of new and high quality products possibly commercializable for exportation purpose. This paper targets to clarify various aspects of the matter and to provide answers to the following questions: (i) What are competitive advantageous producing sectors and the exploitation of inventions in competitive advantageous producing sectors? (ii) Which is the actual status of activities of exploitation of inventions in competitive advantageous producing sectors? (iii) What would be policy based solutions the Government and the State should issue to push up activities of exploitation of inventions in competitive advantageous producing sectors in conformity to actual conditions of Vietnam?*

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## **1. Overview of notions of competitive advantage and exploitation of inventions**

### **1.1. Competitive advantages**

The core meaning of “competition”, in business practice, is to fight for markets. The essential nature of competition is to look for benefits. The objectives of competition are to gain largest interests and benefits to secure existence and development of actors involved into competitions (*M. Porter, 1990*).

The core meaning of “competitive advantages” is to win favorable positions which provide a nation, a region, a sector and an organization with

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possibilities to make investments of their own resources in most effective ways to produce added values.

The core meaning of “competitive capabilities” is to deploy potentials and abilities to fight for existence in business activities and to achieve expected results. The latter can be expressed through benefits, prices, interests, level of product quality as well as possibilities to exploit existing markets and to develop new ones. Competitive capabilities would be assessed in three levels, namely: (i) National competitive capabilities; (ii) Competitive capabilities of sectors and enterprises; and (iii) Competitive capabilities of products and services.

In a deeper vision, the competitive advantages are interpreted as superior positions to competing rivals thanks to possession of resources and more favorable conditions in economic activities. Competitive advantages of an enterprise get achieved thanks to its abilities to offer bigger values or bigger benefits to clients. *M. Porter (1990)* noted that competitive advantages derive from values enterprises or products can offer to buyers. These values, of course, need to be bigger than costs spent by enterprises themselves for that purpose. In practice, competitive advantages of a sector in national scale are those conditions which help enterprises in this sector to operate production and business activities in a more favorable environment and better ways than competitors do. Competitive advantages, by nature, are divided into two categories: static competitive advantages and dynamic competitive advantages. Static competitive advantages include traditional factors such as geological location, sources of labors, natural resources and other input factors of natural and social natures. Dynamic competitive advantages include business related factors such as business environment, investment opportunities, market opportunities, development level of supporting industries, quality of input factors (materials, natural resources, labors) and science and technology (S&T) development levels.

In Vietnam, the selection of competitive advantageous producing sectors is made on basis of a system of 7 indicators, namely: (i) Labors; (ii) Natural resources and input materials; (iii) Business environment; (iv) Investment opportunities; (v) Domestic and export market opportunities; (vi) Supporting industries and services; and (vii) Science, technology, environment protection and social aspects (*Ministry of Industry and Trade-MOIT, 2013*). Interpretations of these indicators are provided under here.

- Labors (quantitative and qualitative aspects): Those sectors which require a large use of labor forces are taken as competitive advantageous thanks to abundant human resources. Those sectors which

use the available sources of qualified labors are taken as highly competitive advantageous;

- Natural resources and input materials: Those sectors which use locally available natural resources and input material are taken as highly competitive advantageous;
- Business environment: Those sectors which get benefits from priority policies for sector development, integration policies and market opening commitments are taken as highly competitive advantageous;
- Investment opportunities: Those sectors which have large margins for investment are taken as highly competitive advantageous;
- Domestic and export market opportunities: Those sectors which have good export markets or big domestic market demands are taken as highly competitive advantageous;
- Supporting industries and services: Those sectors which have developed supporting industries and services are taken as competitive advantageous;
- Science, technology, environment protection and social aspects: Those sectors which are based on developed domestic sources of technologies, development of green economy, secured harmonic development of social, economic and environmental aspects are taken as highly competitive advantageous.

Those sectors which satisfy entirely the 7 indicators are selected to be named as highly competitive advantageous. Practice shows, enterprises, if wanting to produce market competitive advantageous products, are required to have high technological capabilities, particularly ones needed for technological innovation. These capabilities get exhibited through abilities to adapt, absorb, master, improve, copy and decode technologies and then to create new products and new production procedures.

### ***1.2. Exploitation of inventions***

According to Vietnam Law on Intellectual Property (2009), inventions are technical solutions in form of product or procedure to resolve certain problem by applying natural rules. Therefore, inventions are products of intellectual activities which bear fully specific aspects of intellectual property and specific attributes of commercial commodities. Inventions get protected by granted patents if satisfying fully the three characteristics: (i) Novelty; (ii) Creativity; and (iii) Industrial applicability. The interpretations for these notions are provided under here:

- Inventions are considered to have novelty if they were not publicly disclosed under utilizable forms, described in texts or any other forms, both domestically and abroad, before the filing date of application for registration of inventions or before the priority date in case the inventions are qualified to get priority status for application;
- Inventions are considered to have creativity if, on basis of the technical solutions publically disclosed under utilizable forms, described in texts or any other forms, both domestically and abroad, before the filing date of application for registration of inventions or before the priority date in case the inventions are qualified to get priority status for application, they are creative advances which are unable to be created easily by people with medium level of knowledge in corresponding technical areas;
- Inventions are considered to have industrial applicability if their contents can be used to carry out a mass production of products or can apply the procedures repeatedly, and produce stable results.

Patents are exclusive rights granted by the Government/the State to inventions. Patents remain to hold legal values during a maximal period of 20 years since the filing date of the applications, provided the fees to maintain the validity of power get paid regularly. Patents are also subject to regulations for territorial power of protection which mean that the protection power of patents gets restricted in geographical limits of the related countries or regions they were granted for. If wanting to get the legal protection for inventions in another countries or regions, the application for those inventions need to be filed in competent offices of the related countries or regions in the legally governed terms of time.

An invention would bring in benefits, particularly economic ones, if they get exploited in reasonable ways. Exploitation of patents plays important roles for development of an enterprise, a sector and a nation in pushing up innovative activities to produce more new products for markets, to link closely inventive activities with enhancement of endogenic technological capabilities, to promote actively activities of transfer of inventions and to link research sectors and industrial sectors.

An invention, being granted of patents, can be exploited when patent owners do themselves exploitation activities or assign other entities to exploit them within the limits of assigned countries or regions. By other words, patent owners have rights to prevent others to use or to exploit their patent granted inventions, and, at the same time, can assign rights to use and to exploit their patented inventions to one or many other individuals/organizations during certain durations of time while still

holding rights to ownership. This transfer of rights is agreed between sides (transferors and transferees) and the terms and conditions for the transfer are recorded in a contract of transfer of rights. For successful exploitation of inventions, owners of patented inventions and related sides have to make analysis of internal and external environments of the business transaction and then identify quantities and market shares of the products produced by the inventions. At the same time, it is also necessary to secure conditions for required resources (capitals, labors, materials, information and etc.) during process of exploitation of inventions.

On basis of these basic notes, the exploitation of inventions, therefore, in competitive advantageous sectors are understood in this paper as the use of utilities and potentials of patent protected inventions in competitive advantageous producing sectors to produce benefits, particularly the economic ones for invention owners and related sides on basis of free wills, target orientation and conformity to legal regulations. The competitive advantageous producing sectors of Vietnam are defined on basis of Decision No. 32/QĐ-TTg on 13<sup>th</sup> January 2015 by the Prime Minister for approval of Integrated Program for development and upgrading of groups of sectors and chains of values of competitive advantageous products. This paper does not have intensions to make detail studies for individual competitive advantageous products but provide a study with global view for competitive advantageous sectors and policy measures to push up the exploitation of inventions in competitive advantageous producing sectors.

## **2. Actual status of exploitation of inventions in competitive advantageous producing sectors of Vietnam**

With purpose to clarify the actual status of exploitation of inventions in competitive advantageous producing sectors, the research team has conducted and processed the following groups of data.

*First, preparation works for primary data:*

- The author designed sheets of questionnaires and conducted surveys of enterprises, inventors, experts, investors and State agencies which are related to exploitation of inventions in competitive advantageous producing sectors over the whole country. The works were implemented on basis of methods of system and random selection of samples. Related surveys were conducted from April to August 2016. The main three topics were focused in questionnaires to include: (i) Overview of competitive advantageous producing sectors and competitive advantageous products; (ii) Actual status of exploitation of inventions and technologies in competitive advantageous producing sectors; and

- (iii) Evaluation of policies to push up the exploitation of inventions in competitive advantageous producing sectors;
- We distributed a total of 420 sheets of questionnaires and collecting back 166 eligible qualified sheets (making 39.5%). In addition, for further collection of views, the author made phone interviews and sent emails to some individuals. The questionnaires were also posted on Facebook. The questions were designed on basis of google.docs and the author received 42 replies but only 20 of them (making 47.6%) were eligible qualified for further assessment. Briefly, there were received 186 eligible qualified sheets including 118 sheets from enterprises and the remaining replies came from inventors, experts, investors and State agencies;
  - We found some shortages in these surveys, namely: the questionnaires were filled up on basis of objective visions of surveyed individuals and the obtained answers may not cover full aspects of exploitation of inventions and aspects of competitive advantages. At the same time, the number of replies was low in comparison to the total number of enterprises in competitive advantageous producing sectors of Vietnam.

*Second, preparation works for secondary data:*

- The author collected data as backgrounds for evaluation of actual status and proposal of solutions for exploitation inventions in competitive advantageous producing sectors, through local and foreign research works and databases of State administration organizations, enterprises, international organizations, in both hardware copy and on-line forms and in connection to inventions, technological innovation and policies for promotion of exploitation of inventions;
- The author, on basis of collected data, conducted classification, initial assessment and use of suitable secondary data for purpose of research targets.

*Third, methods for treatment of data:*

- The author, after having collected data through surveys, conducted works to clean and to encode received data, and at the same time, to use SPSS software as main tool for analysis of the actual status of exploitation of inventions in competitive advantageous producing sectors of Vietnam;
- The paper, in addition, applies methods of descriptive statistic assessment, comparisons, practical summaries and expertise to clarify theory-based backgrounds and actual status as well as to propose

policy-based solutions for promotion of activities for exploitation of inventions in competitive advantageous producing sectors.

### ***2.1. Actual status of technological level***

Many studies, up to now, indicated that majority of technologies actually used by enterprises in Vietnam are the ones of outdated and medium level (See: *Ministry of Planning and Investment, 2007; Vietnam Chamber of Commerce and Industry, 2009; Tran Ngoc Ca, 2011; Nguyen Huu Xuyen and Nguyen Dinh Binh, 2015*), and activities for technological innovation remain small sized, segmented and non-integrated. Innovations actually made by enterprises are capable to resolve problems raised in production-business activities and have no strategic values. Also innovations, in great majority, were based on externally imported technologies. Practice shows almost inconsiderable parts of research activities which were developed by local organizations and could lead to new technologies, utility solutions and inventions for technological innovation. Particularly, limited remain also activities for searching, evaluating, selecting, adapting, absorbing and mastering technologies, as well as mobilizing capitals and exploring markets for output products to serve process of technological innovation.

Among enterprises in competitive advantageous producing sectors, technologies are low applied in comparison to standard levels of the region and the world. Product quality and prices cannot meet market requirements. The rate of import of pieces, equipment and materials for production-business activities remains high. From collected answers to the question “In global vision, which is the level of technologies used in competitive advantageous producing sectors?”, the replies received from the 118 enterprises show: 11.1% say the used technologies are classified as advanced and highly advanced, 52.5% state the use of medium technologies, 36.4% state the use of outdated and very outdated technologies (statistic assessment gave the average value of 2.76 and the standard deviation of 0.792).

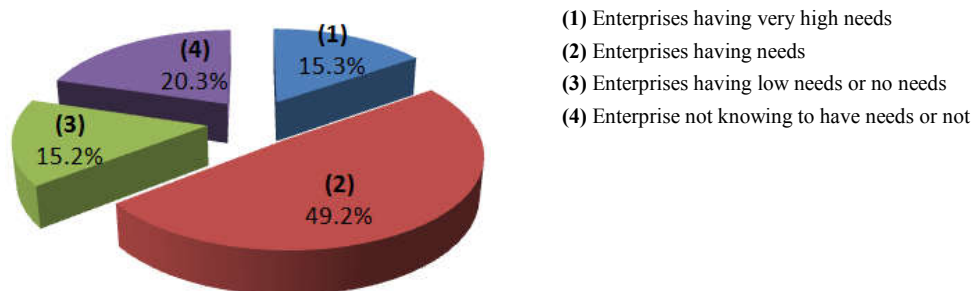
Despite of medium and outdated levels of technologies used by enterprises in competitive advantageous producing sectors, enterprises have no driving motivations necessary for implementation of activities for improvement and innovation of technologies through application and exploitation of inventions. The survey outcomes from the 118 enterprises show, during three recent years, 56.8% of them make an average rate of investment lower than 0.5% of total revenues for activities of exploitation of inventions and

only 6.8% of them make an average rate of investment higher than 2% of revenues for activities of exploitation of inventions.

## 2.2. Actual status of needs and wishes of enterprises for activities of exploitation of inventions

According to outcomes of surveys of 225 enterprises conducted by National Institute of Patent and Technology Exploitation (NIPLEX, 2014), 69% of surveyed enterprises exhibit needs of knowledge and application of inventions but many of them have no information about technology supplying sources, 77.8% of them do not look to access to technology supplying sources and have no information sources of technologies. More than that, Vietnam developed technologies remain few and, even made, they are incapable of creating high economic value products. This leads to great negative impacts to activities of exploitation and application of inventions by enterprises.

Survey outcomes received from the 118 enterprises in competitive advantageous producing sectors show: 15.3% of them exhibit very high needs, 49.2% of them have needs, 15.2% of them show low needs or absolutely no needs, 20.3% of them demonstrate hesitating positions without knowing exactly if they have needs or not (Fig. 1).



Source: Survey outcomes (2016)

**Figure 1.** Needs of exploitation of inventions by enterprises

Fig. 1 shows that enterprises in competitive advantageous producing sectors have needs of application and exploitation of inventions for their activities of technological improvement and innovation. However, enterprises face many barriers to their efforts for application and exploitation of inventions such as difficult access to capital sources and difficult mobilization of capitals, difficult recruitment of high qualified and well trained human resources, difficult access to information sources of inventions, high barriers to legal and technical backgrounds of inventions. Detail outcomes



of replies from the 118 enterprises in competitive advantageous producing sectors are shown as follows:

- Difficult access to capital sources and difficult mobilization of capitals: 47.5% agreed and 13.6% highly agreed;
- Difficult recruitment of high qualified and well trained human resources: 51.7% agreed and 11.9% highly agreed;
- Difficult negotiations with inventors and related sides: 51.7% agreed and 11% highly agreed;
- Difficult valuations and evaluations (both technical and financial aspects): 54.2% agreed and 18.6% highly agreed;
- Difficult selection of commercializable inventions: 56.8% agreed and 16.1% highly agreed;
- Difficult determination and arrangement of cooperation forms between sides: 66.9% agreed and 12.7% highly agreed;
- Difficult determination and fixation of rights to ownership and related benefits: 52.5% agreed and 19.5% highly agreed;
- Difficult turns of patented inventions to technologies to create products for markets: 65.3% agreed and 21.2% highly agreed.

So, despite of needs by enterprises in competitive advantageous producing sectors for application and exploitation of inventions, they face numerous difficulties and need to get support measures from the State in initial stages for successful implementation of their plans of application and exploitation of inventions. Survey outcomes also show that enterprises wish to get supports from the State through measures to motivate, encourage and promote application and exploitation of inventions by enterprises such as: policies for intensive investment, incentive taxation, attractive credits, active training, promotion of demand-supply links of inventions, large implementation of public-private partnership in exploitation of inventions and supports for development of technological infrastructure.

### ***2.3. Actual situation of policies for promotion of exploitation of inventions in competitive advantageous producing sectors***

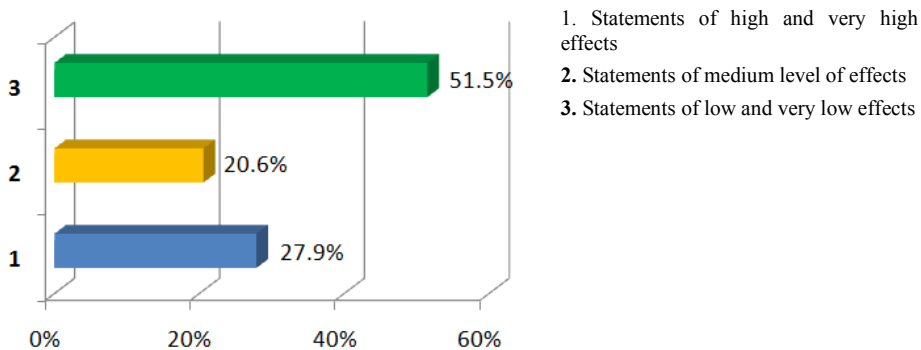
Notifying important roles of activities of application and exploitation of inventions, the State issued many policies to encourage enterprises to apply and to exploit inventions. The policy based measures are well reflected in numerous documents of legal values such as Laws, Decisions, Resolutions, Decrees and Circulars. Some policies may be listed for illustration purpose: Law on Technology Transfer (2006), Law on Intellectual Property (2009),

Law on Science and Technology (2013), and Decision No. 1062/QD-TTg by the Prime Minister on 14<sup>th</sup> June 2016 on approval of Program for development of intellectual assets, 2016-2020 period (which was issued to succeed Decision No. 2204/QD-TTg by the Prime Minister on 6<sup>th</sup> December 2010 on approval of Program for development of intellectual assets, 2010-2015 period); Decision No. 844/QD-TTg by the Prime Minister on 18<sup>th</sup> May 2016 on approval of National Project of supports for eco systems of start-ups of innovations up to 2025; Resolution No. 35/NQ-CP by the Government on 16<sup>th</sup> May 2016 on supports and development of enterprises up to 2020; Resolution No. 119/1999/ND-CP by the Government on some policies and mechanisms to encourage enterprises to make investments for S&T activities; Resolution No. 56/2009/ND-CP by the Government on 30<sup>th</sup> June 2009 on supports for development of small and medium enterprises (SMEs); Circular No. 06/2014/TT-BKHHCN by Ministry of Science and Technology on 25<sup>th</sup> April 2014 on rules for principles and indicators for evaluation, selection and assignment of S&T tasks to be supported by National Fund for technological innovation; Circular No. 08/2015/TT-BKHHCN by Ministry of Science-Technology on rules for implementation of bilateral and multilateral S&T cooperation programs up to 2020 and Program for search and transfer of foreign technologies up to 2020; Circular No. 15/2014/TT-BKHHCN by Ministry of Science-Technology on 13<sup>th</sup> June 2014 on rules for procedural order and formality of transfer of rights to ownership and use of results of State budgeted activities of scientific research and technological development and others.

As it shows there were issued many policies to encourage enterprises in general and enterprises in competitive advantageous producing sectors in particular to exploit inventions for better service of activities of technological innovation. However, these policies were taken by community of enterprises as of too general nature, overlapping, non-integrated, not really fitting international integration requirements and not keeping pace with advancing speed of development of enterprises in activities of application and exploitation of inventions. More than that, activities in fields of information diffusion and policy propaganda remain ineffective. A big majority of questioned enterprises are not aware of existence of supporting policies and they do not know how to access to that if even knowing their existence. The survey outcomes of the 118 enterprises show clearly that enterprises still face many difficulties in looking for and getting benefits from incentive policies for activities of exploitation of inventions, namely the rates of answers to questions are:

- Procedures, formalities and levels of supports for exploitation of inventions remain unsuitable: 55.9% agreed and 16.1% highly agreed;
- Many shortages remain in policy making process for promotion of exploitation of inventions: 53.4% agreed and 14.4% highly agreed;
- Organization of implementation of policies for exploitation of inventions remains unsuitable: 58.5% agreed and 13.6% highly agreed;
- Activities are not arranged well for control and evaluation of impacts from policies for promotion of exploitation of inventions: 50% agreed and 17.8% highly agreed.

Another concern is the impacts of policies to practical activities. Answering to the question “How do policies for promotion of exploitation of inventions bring effects to socio-economic development?” the replies from 68 surveyed individuals (inventors, investors, experts, managers) show (Fig. 2): 27.9% of them say high and very high effects, 20.6% say medium level of effects and even 51.5% of them say low and very low levels of effects (statistic assessment gave the average value of 2.74 and the standard deviation of 1.045).



*Source: Survey outcomes (2016)*

**Figure 2.** Effects from policies for promotion of exploitation of inventions

As it was seen, the State offered many policies to support enterprises in activities for promotion of exploitation of inventions but, in general, these policies did not create really driving forces to promote enterprises in competitive advantageous producing sectors to apply and to exploit inventions for better implementation of activities for technological innovation. Some basic reasons can be listed such as: unclearly defined procedures and formalities, low benefits from incentive policies and many shortages in processes of planning, organization and control of

implementation of policies. From another side, enterprises experience many difficulties in capital aspects (cannot mobilize capitals), low qualification level of human resources and particularly difficulties in fixation of forms of links and cooperation in activities for exploitation of inventions.

### **3. Proposal of solution for promotion of activities for exploitation of inventions in competitive advantageous producing sectors**

Many programs were designed and implemented to push up enterprises in competitive advantageous producing sectors gradually in their activities to enhance endogenous technological capabilities through activities of application and exploitation of inventions and to implement supports for enterprises up to 2020. Some of these programs include: (i) National Program for technological innovation (Decision No. 677/QĐ-TTg on 10<sup>th</sup> May 2011); (ii) Program for development of intellectual assets (Decision No. 1062/QĐ-TTg on 14<sup>th</sup> June 2016); (iii) Program for development of technological market (Decision No. 2075/QĐ-TTg on 8<sup>th</sup> November 2013); (iv) Program for integrated development and upgrading of groups of sectors and chains of values of competitive advantageous products (Decision No. 32/QĐ-TTg on 13<sup>th</sup> January 2015). Some recommendations for State agencies can be proposed, namely:

*First*, measures to be issued to provide credit supports to enhance gradually technological levels and capabilities through activities of application and exploitation of inventions. Actually, on basis of evaluations by enterprises, incentive rates of credits offered by development funds (National Funds for technological innovation and other funds) for activities of research, application and exploitation of inventions remain low (incentive rates are governed by Inter-Ministerial Circular No. 120/2014/TTLT-BTC-BKHCH between Ministry of Finance and Ministry of Science-Technology on 25<sup>th</sup> August 2014 on guidelines for financial management of National Funds for technological innovation), procedures and formalities to get these incentives remain complex (See Inter-Ministerial Circular No. 16/2015/TTLT-BTC-BKHCH on 1<sup>st</sup> September 2015 on guidelines for management and use of assets produced through implementation of State budgeted S&T tasks). Therefore, next to these guidelines, the State should improve operations of funds to offer more incentives and favors for enterprises to implement activities of application and exploitation of inventions and other S&T advances in production activities. Particularly, National Funds for technological innovation should push up and diversify structures of preferential loans for activities of application of inventions and technological encoding by enterprises in competitive advantageous producing sectors. In addition, for mobilization of credit sources, the State

should encourage establishment of finance leasing organizations and independent project appraisal organizations which would offer consulting services to projects of technological innovation and credit organizations on matters of loan volumes, loan terms and loan interest rate in accordance to existing resources of enterprises.

*Second*, measures to be issued to provide supports for enterprises to enhance quality of human resources through activities of cooperation and joint works in programs and projects on training activities to enhance quality of human resources. This would be a crucial important work for implementation of activities for application and exploitation of inventions.

These programs and projects should be designed on basis of analysis and evaluation of compatibility between national objectives of S&T development and objectives for promotion of exploitation of inventions in competitive advantageous producing sectors. On basis of that, the State would offer supports to build up road maps to enhance quality of human resources for enterprises. Favorable supports for involved organizations may come up to 80% - 100% of costs to cover their participation in training and development programs of high quality human resources. These moves should lead enterprises to production of competitive advantageous products.

*Third*, measures to be issued to provide supports to enterprises in evaluation and valuation of inventions targeted for successful application and exploitation of inventions. A necessary and important component in these supports for evaluation and valuation activities is establishment and development of a system of experts and specialized organizations for evaluation and valuation of inventions. Actually, Ministry of Science-Technology has NISTX which actively participates in activities of evaluation and valuation of inventions and technologies. In global views, methods of valuation of patents, inventions and technologies are based on Inter-Ministerial Circular No. 39/2014/TTLT-BKH-CN-BTC on 17<sup>th</sup> December 2012 on rules for valuation of results of State budgeted activities of scientific researches and technological application as well as generated intellectual assets. However, the legal power of the Circular is not high and it cannot play as guaranty documents to assist enterprises to borrow loans as well as to contribute capitals. Therefore, the State should encourage establishment of independent specialized organizations for professional evaluation and valuation of inventions which could quantify financially these intellectual assets. The organizations of this type would have their independent legal status and bear legal liabilities for statements of their valuation works. The statements of evaluation and valuation works are also important backgrounds for banks and credit organizations to offer loans and

for involved sides to decide capital contributions for development of production-business activities.

*Fourth*, measures to be issued to promote public-private partnership activities for application and exploitation of inventions. This model can be interpreted as agreement between State and private partners in activities for application and exploitation of inventions on basis of good will, equal, faire, democratic and lawful principles of interest and risk sharing during the whole process of application and exploitation of inventions. This model can involve participation of investors, businessmen (capital offer, studies of markets for output products), producing enterprises (human resources, workshops, machines, equipment and infrastructure facilities), inventors (patents and know-hows for creation of technologies and production of invention-based products), State supports (financial measures, training of human resources, taxations, credits, land use and favorable legal environment) and even consulting experts during implementation of exploitation of inventions. This model would stimulate advantages/potentials as well as to restrict disadvantages of involved sides in efforts to focus resources for exploitation of inventions. For efficient operation of this model, the involved sides should define clearly targets and roles during implementation of exploitation of inventions, benefits and risks, level and scope of activities of exploitation of inventions and establishment of mechanisms to control conflicts of interests

*Fifth*, measures to be issued to put enterprises in competitive advantageous producing sectors to center positions in planning and implementation of policies. Actually, application and exploitation of inventions do not produce high effects for socio-economic development partially due to absence of active involvement of enterprises in process of planning and implementation of policies. Also, enterprises in competitive advantageous producing sectors in general do not develop close links to set up global supply chains with low rates of activities for technological innovation through application and exploitation of inventions. These shortages lead to restriction of S&T based strengths of producing sectors. So, for purpose to enhance competitive positions of involved sectors through activities of application and exploitation of inventions, the State should pay attentions to wishes and recommendations from enterprises and vocational associations. These wishes and recommendations have important senses for amendment and improvement of existing policies and issuance of new policies to meet demands of enterprises in their activities for application and exploitation of inventions.

In addition, the State should offer supports for enterprises in competitive advantageous producing sectors to set up their own funds for S&T

development in conformity to Inter-Ministerial Circular No. 12/2016/TTLT-BKHCHN-BTC on 28<sup>th</sup> June 2016 on guidelines for expenditures and management of funds for S&T development of enterprises. This measure would help to set up financial resources for application and exploitation of inventions to serve efforts for technological innovation by enterprises. This would be important backgrounds for enterprises to enhance quality of products and to develop competitive advantages. Additional measures are communication and propaganda activities which would enhance awareness by enterprises in competitive advantageous producing sectors for benefits from application and exploitation of inventions for creation of higher competitive positions for enterprises themselves./.

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