

STUDY OF MANAGEMENT POLICIES OF ACTIVITIES OF SCIENTIFIC RESEARCH AND TECHNOLOGICAL DEVELOPMENT FOR US CORPORATIONS AND COMPANIES

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Abstract:

In the US, in addition to universities, national research institutes and specific research institutes of ministries, there is a system of laboratories of corporations and companies which carry out also fundamental researches, R&D and applied researches (making over 74% of the total volume of science-technology (S&T) activities). This study will provide a discussion on management policies of activities of scientific research and technological development applied for US corporations and companies including: introduction of types of US enterprises, orientation of entrepreneurial Government policies and management policies of S&T activities. These US experiences may open an approach for management policies of S&T activities for Vietnamese corporations and companies as well as for Vietnamese researchers and managers.

Keywords: Management policy; Scientific research activity; Technological development activities; US enterprises.

1. Introduction of types of US enterprises

The US does not have the global regulation of setting up enterprises which would be applied for all the states. The states have their own different regulation for this matter. The law of the states for types of enterprises may be different. From legal point of view, in the US, there is not the form of representative offices as we have in Vietnam. Almost all the states do not require the minimal capital for setting up enterprises. In all the states, the formality of setting up enterprises is simple and fast. FDI enterprises and domestic enterprises are to follow the same governing laws. There are four types of enterprises which exist in all the states.

Sole Proprietorship: The simplest and fastest formality is applied to set up this type of enterprises. As always, it is necessary to fill up application forms available in all stationeries and then send to registering authorities of the state or county. Subject to concrete requirement of each state, the applicant may be required to send a few sets of application forms and/or certified signature. A small registration fee should be sent together with the application forms which can be paid by cashier's check or money order.

Partnership: The formality to set up this type of enterprises as it is for Sole Proprietorship. Enterprises of this type may have two owners or more. The participation status of each owner decided by participating owners and it is agreed by writing and signed by all the owners with assistance of lawyers. This type of enterprises can be also full or limited. Full owners usually share the ownership, work duties and liabilities and limited owners would not involved into management decisions and would not be liable for problems raised from decisions by managers.

Corporation: This type of enterprises is more standard. US leading enterprises in majority are of this type. They have the independent legal status which let them operate even when the owners cease existing. The ownership right can be transferred to others. Enterprises of this type can issue shares to mobilize capital, and the owners are not liable by personal assets for legal verdicts.

Limited Liability Company: It is a type of enterprises which combines the types of partnership and corporation. This is the most popular type of enterprises in the US. Similarly to the partnership type, Limited Liability Company exists independently from owners in terms of legal status. Owners and managers are nor personally liable for debts and duties of the company. Similarly, to the type of partnership and corporation, the limited liability company does not pay corporate income taxes, but benefits or losses of the enterprise are shared among owners and assigned to their income for personal income taxes. The names of these enterprises need to be ended by LLC or L.L.C or Limited Liability Company.

2. Orientations of policies of the US Government are full of entrepreneurship spirit

The US Government always gives priority to innovate the State management mechanism to serve enterprises. In the book entitled *Reinventing Government* [1], David Osborne and Ted Gaebler showed the model of transfer from the power-central administrative organization to the decentralized organization. More concretely, it is related to the transfer of management organizations under the Government control from hierarchic administrative structure to the new type to support and encourage development and entrepreneurship. US scholars note ten orientations of policies which reflect the entrepreneurship spirit, namely:

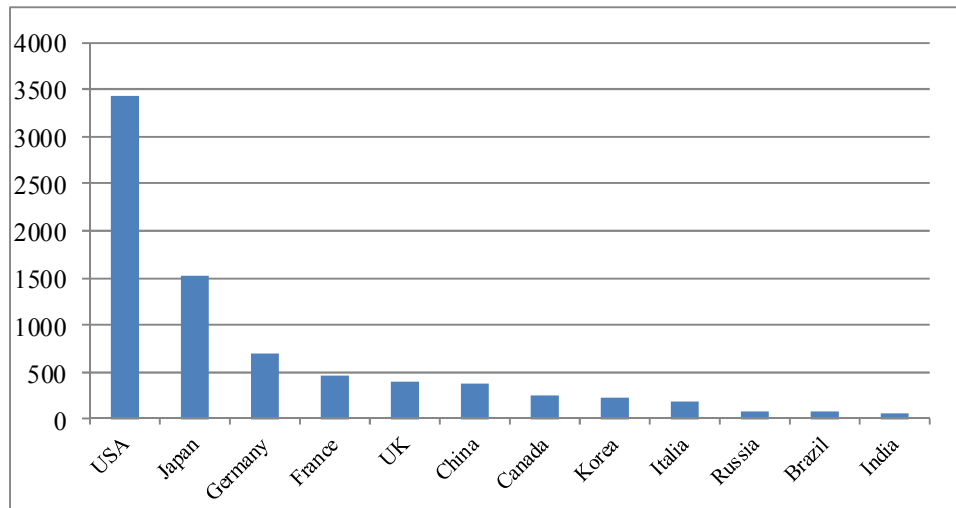
- (1) The Government plays a catalyst role: focused more on “steering” rather than “driving”;
- (2) The Government is based on communities: consolidation of power rather than direct service;

- (3) The Government exhibits a high competitiveness: creation of competition in process to provide public services;
- (4) The Government operates with pushing missions: change of organizations heavily regulated by administrative formalities;
- (5) The Government operates on result-based principles: budgets are provided on output basis but not input basis;
- (6) The Government pays attention to clients: meeting needs of citizens but not internal demands of administrative machines;
- (7) The Government takes risks: investment for increasing collection sources but not simply for expenditures;
- (8) The Government is full of precaution: preventing rather than curing;
- (9) The Government is of power decentralization: transfer from administrative hierarchy to enhancement of participation and team working;
- (10) The Government operates on market orientations: application of market mechanisms to create change driving forces.

These ten orientations of policies put down requirements to change the system of State administrative organizations and enterprises. This can be seen through competing capacities, effectiveness and efficiency, choices of clients, responsibilities to explain results, common efforts and involvement of the whole society and communities.

3. Management policies for scientific research and technologies development applied to corporations and companies

Actually, every decision of the US Government, with its steering role, causes great impacts to results of scientific research projects through macro management policies. The attention of enterprises and researchers is not the volume of investment by the Government for education and research but future orientations of development of education and scientific research. The US Government invests heavily for fundamental sciences through the Federal budget allocations which comes up to USD90 billion per year which is almost 1% GNP (Figure 1). Solely the bio-medical research sector gets a support of USD25 billion every year [2].



Source: Chinese Ministry of Science & Technology, Jan. 2007 (OECD) RICYT, UNESCO

Figure 1: Global expenditure for R&D (GERD) of some countries.

Together with strategies and policies for education and science development of the US Government, during recent years, strategies and policies for scientific research and technological development passed changes within US corporations and companies, namely:

First, corporations and companies get linked to find solutions to new S&T problems (during the past US corporations and companies were linked closely with universities and specific research institutes for research cooperation and fast use of created results of fundamental research).

Second, S&T activities within corporations and companies are not only oriented to produce new products to meet market requirements but they are taken as focus for success on markets.

Third, successes are not limited by S&T application to produce a concrete product but also strategies for long-term maintenance of advanced technologies for technological innovations.

Fourth, S&T together with innovations are put in center of visions, thoughts and actions of enterprises and the Government - "Science is on right position".

Fifth, policies of links mean that the solutions require the strategic partnership relation: Federal organizations, local government agencies at various levels, public sectors, private sectors, humanitarian services, shortly the whole country - "All on the same boat".

According to the report at the Europe-US Summit on science-technology and sustainable development [2], the US Government does not support all the

research projects because otherwise the investment capital would be spread largely and segmented (*not talking yet about possible negative sides related to application for supports*) which potentially could not lead to satisfied results of research and expected applications. It is why the regulating actions from the Government are highly required for macro-level management as well as decisive actions to focus on key scientific projects. The remaining part of enterprises is stimulated to mobilize their advantages through efforts for high standards of products they can provide through orders from researchers about development orientation which they proposed. For example, in sector of food export, if they do not want to get back returned products because of the presence of excessive residues of antibiotic or other chemicals in products they need not only to use advanced equipment and method and apply high standards for detection of excessive antibiotics and chemicals but also require the service of scientists to identify new solutions to enhance the quality of their products which would be cleaner and better than the ones offered by competitors.

For this end, the Government needs to be clear and more effective in managing works and finding measures so that enterprises come to understand that their better investment would be beneficial for the two reasons:

First, through enhancement of quality of products they would keep patents of research works which could bring in secondary benefits when other enterprises need (this situation is typical for companies in field of pharmaceutical products, milks and animal foods).

Second, when getting orders from enterprises researchers would be more responsible in their research works. It is quite different from the research projects they get supports from the Government. Orders from enterprises put researchers on position of tough competition which would lead to development. Then research works are a kind of games where ones may win or lose. Funds which are provided by the Government without being used reasonably, and research works which are completed without being applied will destroy new ideas.

In the US, for projects of scientific research in a public university get, in terms of investment funds, only partial support from the Government and the remaining part is supported by private corporations and companies. However, large corporations and companies have their own research centers. Why do enterprises do investment for research projects for these two orientations: the Government and companies? Simply because the Government wants to raise the living quality of people then needs to make a tougher management of quality standards of consuming commodities, the typical case being nutrition products and foods for a better health of the whole community. Once enterprises want to cross this “border pass” of standards raised by the Government and to produce good commodities to win the competition they

have to cooperate with scientists, and inversely, scientists if wanting to get order from enterprises need to do hard labors. There exists, of course, a tacit competition among scientists and researchers. However, this, as a piece of luck, is the driving force for the social development.

In the US, the active involvement of the Government into investment for science-technology is posed on the following criteria: *First*, science knowledge is the key to future; *Second*, technologies are driving forces for socio-economic development; and *Third*, responsibilities of the Government are to encourage and do investments for national science-technology development.

The top priority policies for research of production technology innovations are realized in the US under large cooperation between the Federal Government, associations and research institutes as well as the set-up of technological infrastructure, namely:

- (1) US industrial policies focused on pushing up the research-based development of technologies. The policies of development of technologies provided the breakthrough in automobile industry and technical fuels (*manufacture of engines*);
- (2) Policies to extend the lifetime of construction works and to secure the safety of surrounding environment (*construction industry*);
- (3) Policies to encourage technologies, high risky but promising, which permit to produce fully new products and services as well as their commercialization (*high techs*);
- (4) Policies to remove the gaps between military industrial facilities and civil industrial facilities as well as the attention paid to priorities military-industrial groups can provide (*investment for development of priority technologies*);
- (5) Policies to provide technologies and to conduct appraisals for implementation of projects (*application of results of science-technology research and researches produced by the Government owned laboratories*).

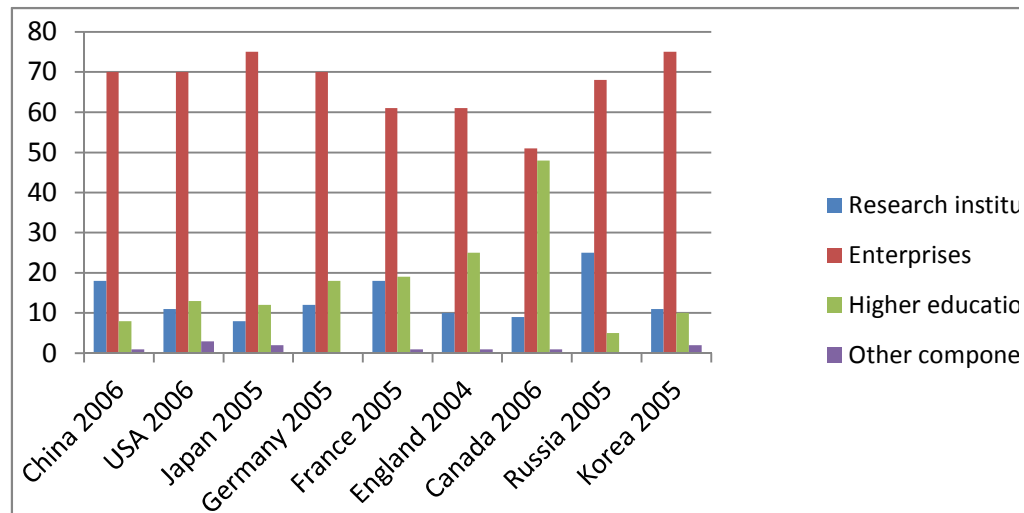
Policies of “dual industries” are part of the State program for confidential technologies stimulate considerably the linking process between military industries and civil industries through removing the organizational and technical barriers between economic sectors. Keeping line with the selected trends of priority innovations the State strategic orientations of US policies were defined for enhancement of competing capacities of the US economy and science-technologies in the XXI century, namely:

- (1) Securing encouraging measures from the Government for science-technologies;

- (2) Forming and pushing activities of research institutes to extend the scope of innovations. The Government facilitates the development of markets but not changing it;
- (3) Creating a favorable business environment for promotion of innovative activities;
- (4) Orienting US scientific researches on basis to meet requirements of the economy according to allocated budgets;
- (5) Providing the Government supports for US universities and higher quality of education in schools, colleges and universities;
- (6) Providing strong venture funds to terminals of technological innovations in key sectors. Infrastructure and taxation service support the provision of venture funds because they realize that ordinary bank services are unable to meet financial needs for technological start-ups.

Successes of the US Government's management policies for science-technology activities were confirmed in large corporations such as Abbot, AIG, Caterpillar, Chevron, ConocoPhillips, ExxonMobil, Ford, General Electric, Time Warner, Hewlett-Packard, Intel, Cisco, Oracle, Apple and Microsoft have their own laboratories for scientific research activities. According to a 2012 Report [3], the above noted corporations and companies made investment from 10-15% of turnover for purpose of scientific researches, namely:

- *Fundamental research* made 6,3%. Doing investment for fundamental research, US corporations and companies apply a special policy to select real leaders in their fields who are experienced both in doing research works and steering research works, particularly the ones who gathered excellent successes in international publications;
- *Applied research* made 19.6%. US corporations and companies secured annual budgets for applied research to create future development platforms;
- *Development research* made 74.1% (2012) and 70.3% (2006) (*Fig. 2*). They define their system of research facilities and laboratories are based on their own development needs, advantages and human resources.



Source: Chinese Ministry of Science-Technology, 2007

Figure 2: Costs for development research per investment sectors of the world's leading nations

In their nature, corporations and companies have the path-leading role and kick-off role for breakthrough moves of economical sectors. They are positive factors to create competitive advantages, strength and sustainable development of the US economy. Being in center of policies, they contribute more for economical growth and science-technology development. Therefore, we can summarize the whole things as follows: US management policies for scientific research activities and technology development for corporations and companies are applied very flexibly and effectively. They use the three most powerful management tools, namely:

Legal tools: The US had established a progressive legal environment. The tough norms are set up in all the fields of science and technologies including the IP laws. The governing struncture are highly credible and robust in all the sectors then promote scientific research and technology development.

Administrative tools: The US had established a very favorable administrative environment for start-ups. Million enterprises and new science-technology ideas are tested every year. Only a minor part of them can sustain but capable of going far and doing miracle successes.

Economic tools: The US had applied long-lasting effective and efficient economic measures. Ordinary and direct measures of financial investment are applied only for business-production enterprises but not for science-technology enterprises.

Conclusion

Management policies for activities of scientific research and technology development which are applied for US corporations and companies show the existence of mutual links in relations between the Government and enterprises where the later is the necessary condition for science-technology development and socio-economic development. Inversely, the Government is the sufficient condition for enterprises to realize their function of use and commercialization of research results to push up the science-technology development and socio-economic development. In our actual context, we need to issue policies to push up the development of enterprises and to diversify activities of scientific research and technology development to serve enterprises. If the science-technology is the driving force for socio-economic development then enterprises should be first-ranked priorities in the strategies for science-technology development./.

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