SOME FACTORS AFFECTING SCIENTIFIC RESERCH ACTIVITIES OF UNIVERSITIES IN VIETNAM

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Abstract:

Universities have assignments to perform three important missions: teaching, scientific research and social service. To improve their position, universities have different action plans to develop best these missions. Scientific research activity in universities needs to be particularly focused and developed simultaneously with teaching activities and social services. This is especially true for universities in developing countries as Vietnam is. The paper analyzes and clarifies some factors that may affect scientific research activities of universities in Vietnam.

Keywords: *Scientific research activity; University; Factor.*

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1. Introduction

Many countries in the works nowadays follow the modern model of economic development - knowledge-based economic development - where the main focus is made for creation, diffusion and use of knowledge. In the chain of knowledge transformation, the roles of scientific research of universities and research universities are recorded as especially important. Universities with intensified research activities play important roles in production of knowledge and the promotion of fast and effective propagation of produced knowledge make contributions to socio-economic development and growth *(R. Reddy, 2011)*. Universities have not only teaching assignments but also duties to produce new knowledge and transform knowledge to socially useful products. Many countries, with different efforts, make increasing investments for scientific research activities in general and the ones of universities in particular, as well as build up the model of research university *(H.V. Tuyen and N.T.M. Nga, 2015)*. Therefore, activities of universities have important roles in contemporary society or, by other words, universities play crucially important roles, particularly in context of developing countries including Vietnam. In Vietnam, however, scientific research activities remain limited *(Hayden and L.Q.Thiep, 2010)* and much dependent to various factors. This paper provides analysis and clarifies the factors affecting scientific research activities of universities in Vietnam.

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2. Research overview

Some studies have been made in relation to factors affecting scientific research activities of universities.

J.W. Creswell (1985) studied factors affecting publication of research works by professors of US universities and determines a classification of factors: individual factors and environment factors. Individual factors include IQ index, motivation, awareness, age and gender. Environment factors include the university reputation, resource allocation, academic colleagues and research domains.

F. Wood (1990), in a study made for an Australian university indicated 10 factors deciding efficiency of research activities, namely: (i) Individual aspects (capability, creativity, motivation, self-mobilization and aspiration); (ii) Research domain; (iii) Availability of funds, equipment and supporting staffs; (iv) Colleagues and working environment; (v) Faculty at work and faculty working ambiance; (vi) Number of post-graduate students; (vii) Teaching and administrative activities; (viii) Mandate terms; (ix) Expectation by host organizations for research productivity; and (x) Other factors.

R.T. Blackburn et al. (1991) considered some affecting factors such as gender, university quality, professional life time and grade, individual capabilities and efficiency in relation to research activities, scholarship and time rate for research works; priorities offered by host organizations, consensus and supports, and commitments by colleagues for research works.

P. Ramsden (1994) in his studies indicated out some governance factors (e.g., the governance ways by host faculties) and individual factors (e.g., interests for research topics by individual researchers) which define research productivity.

S. Kyvik (1995) indicated that the larger scale of laboratory/faculty/department may offer better conditions for cooperation of research teams. In such units, there possibly exist certain lecturers who have the same research interests, together leading to higher cooperation for joint research activities. Then, the research productivity gets high as results of intensive interactions between researchers. He called it "synthetically strong knowledge".

H. Dundar and D.R. Lewis (1998) provided analysis of two basic factors affecting scientific research productivity, namely: (i) Individual factors; and (ii) Organization-faculty factors. Individual factors include individual capacities (e.g., IQ, index, characters, gender and age) and individual experiences (e.g. qualification and culture gained from education process and culture developed by employing organizations). The features of host organizations include organizational and leading structure, scale of teaching programs and lecturers, control by host universities, availability of technologies and computing tools, quantity of books in libraries. Finally, the features of the host faculty include the working culture and conditions (e.g.

policies for work volumes, availability of holidays, funds for research activities, number of research supporting students, availability of "qualified lecturers" and availability of non-government research funds.

C.J. Bland et al. (2002) reviewed documents related to research productivity by universities and make a model of relation between research productivity and 12 individual factors, 13 factors of host organizations and 3 factors of leading bodies.

J. Jung (2012) indicates factors affecting research productivity including: individual features (demographic status and educational experiences); academic background (professional specialty and mission of educating organizations) and organizational environment (organizational culture, staff management and support policies).

R. Wamala, V.A. Ssembatya (2015) indicated that low research productivity of the academic sector, including universities in developing countries, may come from certain main factors such as high rate of lecturing and tutorial works (due to increasing volume of enrolment vs. stable number of teaching staffs), not really comfortable working and research environment for research works, limited research cooperation (especially in new fields of research) and lack of leading researchers *(T.A. Oya, 2017)*.

Therefore, up to nowadays, there are certain studies made separately for factors affecting research productivity by university lecturers as well as inside-university factors affecting research activities research activities by universities. But there are almost no studies made simultaneously for external and internal factors affecting research activities of universities especially in context of developing countries including Vietnam.

3. Research methodology

This study uses a method based on joint consideration of collected documents, in-depth surveys and round table exchanges in some universities of Vietnam during two years of 2019 and 2020. In-depth surveys and round table exchanges of experts (lecturers, university researchers, managerial staffs of faculties, research institutes and universities) were conducted in some universities of Vietnam including Thai Nguyen University, Hanoi University of Social Sciences and Humanities (Hanoi National University); An Giang University, Hochiminh City University of Social Sciences and Humanities (Hochiminh City National University), Hochiminh City University of Food Industry, Can Tho University and some others. The interested topics relate to assessment and evaluation by experts on factors affecting scientific research activities of universities where they work and the whole community of universities in Vietnam in general since early 2000.

4. Research results

On basis of references to studies by domestic and external researchers combined with views and evaluations by experts through the above mentioned exchanges, the description of the factors possibly affecting scientific research activities of universities in Vietnam is given in Fig. 1.
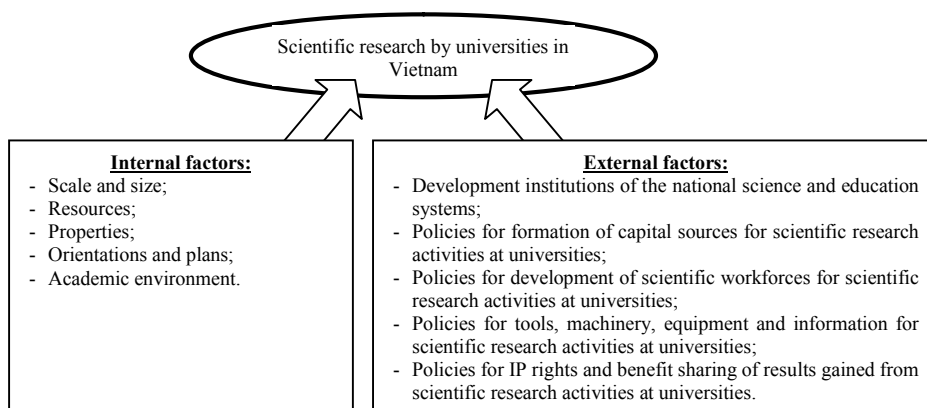
Scientific research by universities in Vietnam

Internal factors:
- Scale and size;
- Resources;
- Properties;
- Orientations and plans;
- Academic environment.

External factors:
- Development institutions of the national science and education systems;
- Policies for formation of capital sources for scientific research activities at universities;
- Policies for development of scientific workforces for scientific research activities at universities;
- Policies for tools, machinery, equipment and information for scientific research activities at universities;
- Policies for IP rights and benefit sharing of results gained from scientific research activities at universities.

Figure 1. Factors affecting scientific research activities by universities in Vietnam

4.1. Internal factors

1) Scale and size

The scale and size of universities are seen through numerous indicators such as the number of enrolled students and lecturers in full-time equivalent terms (FTE) per year and the number and size of campuses. In general, the affectation of the scale and size of universities and capabilities for realization of scientific research projects by universities is relatively complex. It is highly difficult to simplify them down to some concrete indicators. The latters vary largely between countries and universities in a single country. The difference in term of the scale of universities for scientific research activities can be explained briefly as follows:

- Every scientific research project has certain uncertainties and faces certain risks. The risk of research projects is particularly high when they deal with "very high risk" fields, last for a long period of time and require large budgets. Only the universities with large scale and strong resources are capable to realize such a type of research projects;

- Some large scientific research projects, for realization of large scientific research projects, need to mobilize numerous scientists from different fields and, in some cases, student-assistants;

- Scientific research requires use of sophisticated and expensive specific equipment and, in these cases, only large scale universities are capable for that.

Here we should note that, in some countries, the universities are focused in limited scientific fields which are 6 including: natural sciences, technical and technological sciences; medico-pharmaceutical sciences, agricultural sciences, social sciences and humanity sciences *(OECD, 2007)*. Therefore, some universities in technical and technological fields (differently from universities in social and humanity fields) have better cooperation with businesses and then have better chances to mobilize resources.

2) Resources

Resources of universities include tangible assets (material infrastructure, machinery, equipments and etc.) and intangible assets (human resources, reputation and etc.). In many cases the age of universities causes certain affectations to scientific research activities (of course, there are cases when newly established universities conduct strong scientific research activities).

3) Properties

The university, an academic institution as other social institutions, has different property status (public universities, non-public universities, foreign invested universities and combined versions)[2]. The property status affects strategic decisions for scientific research activities of universities as well as formation of research universities. Particularly in context of developing countries which follow the Soviet model this situation gets exhibited more clearly. Some views indicate that, in comparison to non-public universities, the public universities get more privileges. In addition to the allocated annual budget, they get privileges to land use rights as well as easier access to other State resources and many other priorities. This situation, however, is not the same in developed countries. Since developed countries have many well reputed universities (quality of teaching, quality of research) which are private universities. As examples, among 108 universities ranked as Very High Research University (RU/VH) according to 2010 Carnegie classification there are 34 private universities; some of them can be listed such as Boston University, Harvard University, Johns Hopkins University, Massachusetts Institute of Technologies, Princeton University, Stanford University, Chicago University and Yale University.

In relation to property status, it is necessary to deal with intangible assets of universities, particularly non-public ones. From strategic views, they are the most important assets of universities since these assets are competitive advantages in teaching and scientific research activities. These resources reflect capabilities to attract talent students, high qualified lecturers and external resources. These intangible assets include knowledge volumes accumulated through numerous generations (lecturers, students) through academic and teaching activities, and resources of "commercial" nature (reputation, social truth and etc.). *Pham Thi Ly*

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[2] In Japan, there are national universities, public universities and private universities.

(2014) distinguishes two types of universities: public universities (non-profit) and private universities (profit earning) on basis of three indicators: property status, power structure and mode of use of profits.

4) Orientations and plans for development of universities

Orientations and plans for development of universities would decide numerous questions: Do they conduct scientific research activities? What is the investment rate for scientific research activities? What are research topics focused for? In developed countries where science and education develop on basis of autonomous institutions (including orientations of scientific research development) and this factor does not affect much scientific research activities of universities. In many developing countries, however, the orientations and plans for development of (public) universities in general and orientations of development of scientific research activities in particular are based on the national S&T development directions of each period. Therefore, this factor also affects scientific research activities of universities.

5) Academic environment of universities

A strong university requires a strong and united collective, free and tolerant academic spirits of working environment and livelihood between scientists. This would lead not only to better teaching activities but also enhanced operational productivity and higher eagerness for research activities. At the same time, the staffs which do not conduct research works would offer best conditions for research staffs of universities to conduct scientific research activities. This is demonstrated well in the free and tolerant academic environment of Princeton University for the case of scientist John F. Nash who suffers from schizophrenia.

4.2. External factors

1) Development institutions of national science and education systems

In countries with developed science, the development institutions of the national science and education systems get clearly defined. S&T organizations including universities have the autonomous status in right senses. The basic nature of autonomy, in terms of scientific research activities, is reflected in self-governance mechnisms for: i) Deciding orientations of science development; ii) Removing administrative restrictions (the State plays only the supporting roles and applies "rules by laws" mechanisms; iii) Searching sources of supports (mainly in basis of competition); iv) Shifting organizational structure and defining indicators for evaluation of scientific research results on basis of scientific norms *(D.V. Khanh and Heyden, 2010; Vu Cao Dam, 2014)*.

For the science and education systems based on the Soviet model and in developing countries (including Vietnam), this can be seen as the most important factor affecting directly not only scientific research activities of

universities but also indirectly many other factors. This factor turns to be highly complex which, in fact, "re-organizes the science and education systems" and gives more clear shapes to the development institutions of the national science and education systems. *Vu Cao Dam (2014)*, in his studies, deals with this topic, namely: (i) Re-creation of links between science and production, between research and training; (ii) Establishment of really autonomous institutions for science and education systems gradually shifted from the status of *"school of society"* to the status of *"school in society"*. It is necessary to come to the philosophical concept *"Education needs to overpass science" (Vu Cao Dam, 2014)* or the concept emphasized by *C. Goldin and L. Katz (2009)* and *C. Fadel (2014)* for technologies: For development of the society, education should have one step ahead technology and the inverse situation would be "a pain" of the society when education goes behind technology. The vision by the higher education system would cause considerable affectations leading to prosperous development of the society or to its pain *(C. Goldin and L. Katz, 2009; C. Fadel, 2014)*.

2) Policies for formation of capital sources for scientific research activities of universities

It can be seen as one of the most important policies and a component of the development institutions of the national science and education systems. This view is particularly right for universities in developing countries (being gradually shifted to autonomous institutions). When the investment sources of universities for scientific research activities remain still limited they need to get financial supports from the State. In Vietnam some channels to create capital resources for scientific research activities include:

(i)   State budgets for scientific research activities of host organizations (fitting mainly public universities);

(ii)   State foundations and national programs for scientific research activities as national key S&T programs in 5-year plans for science-technological development and socio-economic development;

(iii)   S&T foundations (with roles of "*funding agency*") such as National Foundation for S&T Development and other foundations for S&T development (ministries, sectors, local governments);

(iv)   Funds from key programs for higher education development (actually in Vietnam 19 universities were selected to become the national key universities including 2 national universities, 3 regional universities and 14 universities and academies in national key sectors[3]);

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[3] Project "Master plan for the network of the higher education system of Vietnam, First issuance" (Decision No.255/CT on 31st August 1991 and Decision No. 324/CT on 11th September 1992 by the Chairman of the Council of Ministers) and Project "Master plan for the network of universities and colleges, Second and Third

(v)   Self-raised funds of universities which are developed from cooperation links of training and research activities, technology transfer services, technical assistance, consulting services and etc. In addition, the funds also come from tuition fees of learners and external sources (foreign cooperation programs, international loans, supports from individuals and organizations and etc.). Decree No. 99/2014/ND-CP by the Government requires an annual minimal rate of 5% of legally developed collections of universities as investment for development of research potentials and scientific research activities and a minimal rate of 3% of tuition fees for scientific research activities by learners.

3) Policies for development of human resources for scientific research activities of universities

Human resources, together with capitals, are the input index for scientific research activities and affect largely scientific research activities of universities. Policies for development of human resources here include policies for training of human resources for research activities, policies to attract research human resources, policies for recruitment and use of research human resources (including policies for mobility of human resources), policies for salaries and allowances, policies for working environment for research human resources and some other policies for human resources promotion. In Vietnam, the typical policy for promotion of research human resources is presented in Project 322[4], Project 911[5], Project 2395[6] and Project "Overseas training programs of State staffs supported by State budgets"[7], Project "Enhancing capacities of lecturers and managing staffs of higher education facilities to meet demands of global and radical renovation of education and training activities, 2019-2030 period"[8], Decree No. 40/2014/ND-CP on 12th May 2014[9] and Decree No. 99/2014/ND-CP on 25th October 2014[10].

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issuances and amendments" (Decision No. 47/2001/QD-TTg on 04th April 2001, Decision No. 121/2007/QD-TTg on 27th July 2007 and Decision No. 37/2013/QD-TTg on 26th June 2013).

[4] Decision No. 322/QD-TTg on 19th April 2000 by the Prime Minister for approval of Project "Overseas training program of State staffs supported by State budgets" (shortly called Project 322).

[5] Decision No. 911/QD-TTg on 17th June 2010 by the Prime Minister for approval of Project "Doctor level training program for lecturers of universities and colleges, 2010-2020 period' (shortly called Project 911).

[6] Decision No. 2395/QD-TTg on 25th December 2015 by Prime Minister for approval of Project "Domestic and overseas training program of scientific research human resources supported by State budgets".

[7] Decision No. 599/QD-TTg on 17th April 2013 by the Prime Minister for approval of Project "Overseas training program for State staffs supported by State budgets, 2013-2020 period".

[8] Decision No. 89/QD-TTg on 18th January 2019 by the Prime Minister for approval of Project "Enhancing capacities of lecturers and managing staffs of higher education facilities to meet demands of global and radical renovation of education and training, 2019-2030 period".

[9] Decree No. 40/2014/ND-CP on 12th May 2014 by the Government regulating the advantageous use of S&T researchers.

[10] Decree No. 99/2014/ND-CP on 25th October 2014 by the Government regulating the investments for development of potentials of and stimulations for S&T activities in higher education facilities.

4) Policies for facilities, machinery, equipments and information to serve scientific research activities of universities

Machinery and equipments, as input resources, affect directly scientific research activities of universities. Therefore, State policies to them cause certain affectations to scientific research activities of universities. This is particularly right in case of universities because many of them are quite expensive and have high rate of intangible depreciation, particularly for the case of specific application equipments. Therefore, it is needed to have right rules for computing depreciation rate of scientific research equipments.

Also, when universities decide to do themselves or cooperate with other organizations, local or overseas, for realization of scientific research activities, they should consult different scientific information sources and conduct evaluation works for selection of the most appropriate research topics including: identification of research topics and cooperation partners (organizations and individuals with strong advantages), research equipments, support sources (if necessary) and other related matters. In addition, the necessary information includes State support policies for scientific research activities of universities.

Policies for facilities, machinery, equipments and information to serve scientific research activities of universities in Vietnam are reflected in purpose for: (i) Enhancing capacities of scientific research facilities including priority investments for key facilities and key laboratories in universities (Decision No. 711/QD-TTg on 13th June 2012[11]); (ii) Enhancing material infrastructure of universities including: supports in land use regulations; favourable conditions for exploitation of investment resources for renovation of technical facilities and equipments; enhancement of capabilities and quality of activities of libraries in universities; formation of electronically networked libraries in an area, region and over the whole country; set-up of global information networks and extension of international contacts for all the local universities and colleges; set-up of some national key laboratories in key and lead universities (Decision No. 121/2007/QD-TTg on 27th July 2007 and Decision No. 37/2013/QD-TTg on 26th June 2013); enhancement of management and development works for S&T information services (Decree No. 11/2014/ND-CP on 18th February 2014[12]); set-up of modern and integrated systems of national key laboratories (specific purpose and inter-sectorial application); set-up of systems of libraries, magazines, S&T information technology and database infrastructure; purchase of intellectual assets and rights for access to foreign S&T database; purchase of technologies, supports for transfer and import of technologies from external sources in conformity to legal regulations (Decree No. 99/2014/ND-CP on 25th October 2014).

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[11] Decision No. 711/QD-TTg on 13th June 2012 by the Prime Minister for approval of "Strategies for education development, 2011-2020 period".

[12] Decree No. 11/2014/ND-CP on 18th February 2014 by the Prime Minister on S&T information activities.

5) Policies for IP rights and benefit sharing of results gained from scientific research activities

Policies for IP rights affect considerably scientific research activities of universities. Attentions should be also paid to sharing benefits gained from use of scientific research results from research activities supported by State budgets (fully or partially) or cooperation with external organizations. Some studies also consider important contributions from universities for innovation (third assignment of universities) with special attentions for patents and licenses of universities in technology transfer activities *(R. Crescenzi et al., 2017; F. Giones, 2019)*. Here it is necessary to mention an important law of the USA, namely Bayh-Dole Law (1980), which governs the IP rights originated from US Government supported research works. The Law allows the research realizing entities (individuals and host universities) to apply for patents of their research inventions. The retaining of property rights toward the made inventions was the main driving force for economic booms in the US during the following years. In Vietnam, policies for IP rights and benefit sharing of scientific research results of universities are presented in Law on Science and Technology (2013), Law on Intellectual Property (2005, amended by 2009 and 2019) and Law on Technology Transfer (2017).

5. Conclusion

This study provides analysis and clarifies 10 factors (5 internal factors and 5 external factors) which affect scientific research activities of universities in Vietnam. It is also necessary to remark that the classification of internal and external factors is only of relative nature with eventual overlapping, interferences and resonances of some factors. However, the analysis provided by the author shows that the above mentioned factors can mark generally the factors affecting scientific research activities of universities in Vietnam. The factor "the development institutions of the national science and education systems" is the most important and large affecting factor for scientific research activities of universities. This study is expected to provide certain initial proposals for policy makers to prepare policies for science and education development of Vietnam in general and development of scientific research activities of universities in particular as well as formation of the model of research universities in future./.

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