IS THE VOLUME OF DOMESTIC PATENTING IN VIETNAM A CAUSE FOR CONCERN? AN EXPLORATION OF THE ISSUE AND ITS POLICY IMPLICATIONS

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Abstract:

This paper examines the assumption that the volume of domestic patenting in Vietnam is too low and needs to be expanded. The structure and state of development of the Vietnamese economy and a set of relevant systems - including the Science and Technology (S&T) System, the Intellectual Property System, the National Innovation System (NIS), and the Science, Technology and Innovation (STI) Policy System of Vietnam - are described and analyzed in order to determine, in qualitative terms, the extent to which the volume of domestic patenting is dependent on these framework conditions. An appraisal of the volume of domestic patenting is also been undertaken by analyzing data collected from various sources.

The study concludes that Vietnam does not need to make a strong effort to increase the volume of domestic patenting per se. Instead, S&T, Intellectual Property Right (IPR) and STI policy systems should be strengthened to identify, develop and disseminate technologies appropriate for meeting the developmental goals. If these measures are effectively implemented, the NIS as a whole will also be strengthened and the industrialization of the country promoted. A system of technological indicators, including patent indicators, should also be established as a foundation for monitoring and analysing inventive and innovative activities.

Keywords: *Intellectual Property; Patents.*

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1. Introduction

"The recent history seems to show that technology and knowledge are important factors for economic growth and development. By offering exclusive rights for a limited period, an inventor may recover R&D costs and investments. It also promotes investment to commercialize and market new inventions so that the general public can enjoy the fruit of the innovation. Further, the system is designed to disseminate knowledge and information to the public through publication of patent applications and

granted patents"[1]. However, there has also been the opposing or critical view that patenting per se is less important and in fact detrimental to knowledge diffusion by giving rise to anticommons and subsequent under-usage of scarce resources [6, 7]. In this paper we argue that what is really important for an economy are inventive and innovative activities, and that the level of patenting is a crude and sometimes insufficient indicator of such activities.

Table 1. Patent Domestic Applications Received from 2006 to 2012 in Selected Countries

Year / Country	Vietnam	Thailand	Korea	China
2006	196	1,040	125,476	122,318
2007	219	945	128,701	153,060
2008	204	902	127,114	194,579
2009	258	1,025	127,316	229,096
2010	306	1,214	131,805	293,066
2011	301	927	138,034	415,829
2012	382	1020	148,136	535,313

Source: NOIP, DIP, KIPO, SIPO and WIPO

The patent figures in Table 1 show that Vietnam lags far behind some of the other countries in the region. These figures have been a cause for some concern to many experts and policy makers in Vietnam, mainly under the assumption that the industrialization and modernization of the country will, to some extent, be negatively affected by the low volume of domestic patenting. Thus, restructuring the S&T system and research organizations, improving the IPR system, etc., is high on the agenda with a view of increasing the volume of domestic patenting in Vietnam. However, the question raised here is whether the volume of domestic patenting in Vietnam is in fact a cause for concern. More specifically, what exactly does the volume of domestic patenting indicate? What are the strengths and weaknesses of patents as indicators of innovative activities? To what extent and in what ways is the volume of domestic patenting in Vietnam depending on the structure and state of development of the NIS and STI Policy System? In response to these questions, a conceptual approach will be taken in which the structure and state of development of Vietnamese economy and a set of systems, such as the NIS, the IPR system, etc, are

[1] http://www.wipo.int/patent-law/en/developments/economic.html

analyzed. A general appraisal of domestic patenting activities will also be carried out and, on that basis, policy implications will be clarified. The study will mainly focus on domestic patenting-related issues, not on utility solutions and patent designs that have little technology content.

Patent as a Technological Indicator

"Patents are the outcome of the part of S&T activities which have a proprietary nature and are likely to generate business applications; in other words, they are more likely to reflect technological rather than scientific activities" [5]. "The number of patent applications can be viewed not only as a measure of innovative output, but also as an indicator of the level of innovative activity itself" [10]. Patenting itself has advantages and disadvantages [3, 5], particularly:

Advantages:

- Patents represent outcome of the inventive process, and more specifically of those inventions which are expected to have a business impact. They are particularly appropriate indicators to capture the proprietary and competitive dimension of technical change;
- The detailed information is available about the type of technology, the inventor, markets, etc;
- Patents are broken down by technical fields, providing information not only on the rate of inventive activity, but also on its direction;
- Patent statistics are available in large numbers and for a very long time series.

Disadvantages:

- Not all inventions are patented. Sometimes firms protect their innovations with alternative methods, notably industrial secrecy;
- Not all inventions are technically patentable. This is the case for software which has an increasingly important role in current technological advance and which, after a long controversy, is now mainly protected in the majority of countries by copyright[2].
- In spite of the international patent agreements among the majority of industrial countries, each national patent office has its own institutional characteristics; the attractiveness for applicants of any patent institution depends on the nature, cost, length and effectiveness of protection accorded.

[2] In some countries, especially developed ones and in certain cases, software can be protected as patents.

The advantages and value of patenting clearly depend on a number of factors, not least in which economic context the patent is granted. As pointed out by Narin et.al. [9] "the number of patents a company holds is not a significant predictor of its performance. The important factor is the quality of a company's patent, rather than their number". Moreover, as Hall points out, "patents are valuable only if they can be enforced" [12].

From this perspective, it can be argued that patent applications may not be so important for economic growth and development of a country like Vietnam that it warrants strong efforts to expand the volume of patenting.

2. The Vietnamese case: a description of relevant conditions

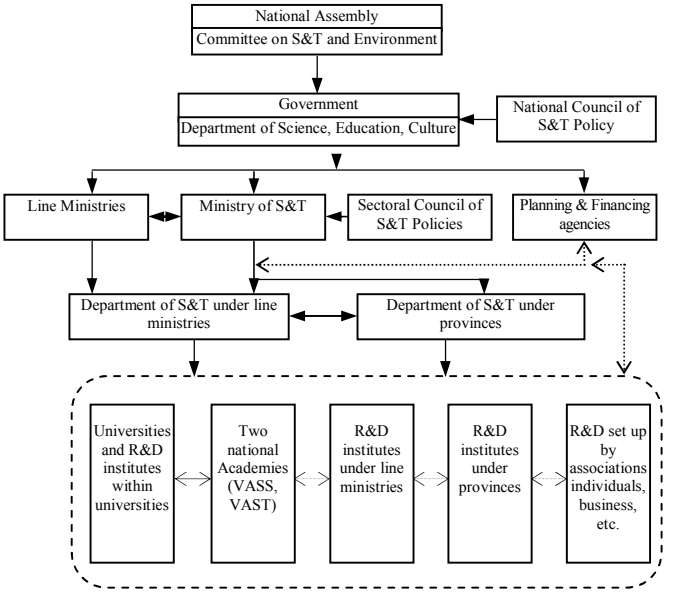
2.1. The structure and state of development of the Vietnamese economy

Under Doi Moi, Vietnam has changed its economic structure from an agriculture-based economy to one in which the industrial (manufacturing in particular) and service sectors have achieved distinctive importance. Shifting the economic structure towards an increasing proportion of industry and services and reducing that of agriculture in GDP is the main road for the industrialization and modernization of the country. Even so, agriculture will still play a major role in the economic structure in the years to come.

If we look at the volume of domestic patenting during 2006 - 2012 presented in Table 1 and compare it with GDP growth during the same period in search of a possible link between them, there is no evidence, or at least insufficient data, suggesting a contribution to GDP growth. It means that the latter is not likely to be dependent on the former. If one places domestic patenting in the context of the structure and state of development of the economy, then the low volume of domestic patenting is what one would expect. It becomes understandable when considering the situation in a country like Vietnam, which is unlikely to produce as many patents as countries which have a larger proportion of patent-intensive sectors such as information technology, biotechnology, pharmaceuticals, etc.

2.2. The Vietnamese S&T system

Vietnam awards S&T development together with education and training development highest priorities - as foundations and motivations for speeding up the country's industrialization and modernization process. This requires an effective S&T system with strong and dynamic actors like universities, research organizations, institutes, enterprises, etc, that will also provide a solid foundation for inventive and innovative activities. Thus, domestic patenting is strongly dependent on the S&T system.



Source: Mai Ha, 2009-Bauer, 2002

Figure 1. Organizational structure of S&T system in Vietnam

2.3. The national innovation system of Vietnam

The NIS of Vietnam can be described with regard to two aspects: legislation and actors.

First, in terms of legislation, the Law on S&T, approved in 2000, supplemented and amended in 2013 by the National Assembly, makes provisions for S&T activities.

In addition, the Law on Technology Transfer in 2006 assigned an important task to the Government: to build up a National Programme on Technology Innovation and a National Fund for Technological Innovation with the main objectives of supporting and governing the technological innovation in the economy, especially promoting technological innovation activities in the sector of business enterprises and in remote areas of the country; to provide capital for businesses with low interest rate, etc. The two institutions were established in 2010.

Moreover, the Law on High Technology was introduced to promote innovation activities.

Second, the NIS of Vietnam can be seen as a structure which combines the S&T system (Figure 1) with additional actors such as the domestic funds for development of S&T, the National S&T Alliance, the National Programs on S&T, the National Supporting Centers for S&T, the international funds/donors supporting S&T, and foreign enterprises and organizations.

The NIS of Vietnam, with weak linkages between its actors and with the implementation of legal rules and guidelines (including laws, decrees, circulars, etc) varying across the different sectors, may be considered immature and incoherent. Consequently, the NIS seems to be dependent on domestic patenting rather than the other way around. Besides, domestic patenting and the NIS can interact in a way that information disclosed in patent applications or granted patents becomes an important ground for technological innovation, while innovators must ensure compliance with the laws and regulations of intellectual property rights.

2.4. The Vietnamese IPR system

The IPR system is a network of various sub-systems including the system of legal documents, system of intellectual property management agencies and system of IPR enforcement.

In terms of the legal system of IPRs, it includes the Law on Intellectual Property Law, revised in 2009, decrees guiding the implementation of the Law, and some other relevant laws such as the Civil Codes, the Law on Customs, the Law on S&T, etc.

The network of the state management agencies of intellectual property is designed in Vietnam with three main offices at the central level: first is the National Office of Intellectual Property of Vietnam (NOIP) under the Ministry of S&T, in charge of industrial property rights; second is the Copyright Office of Vietnam (COV) under the Ministry of Culture, Sports and Tourism, responsible for copyright and related rights; and finally the Plant Variety Office (PVO) under the Ministry of Agriculture and Rural Development, responsible for state management of plant variety protection. At the local level, the corresponding departments are also charged with implementing the functions of state management of locally-based intellectual property activities.

The IPR enforcement system of Vietnam complicated, with the involvement of various enforcement agencies having different functions and powers, including the People's Court, the Market Control Agency, the Economic Police, Customs, the Inspectorate of S&T, the Inspectorate of Culture, Sports and Tourism, Vietnam Competition Authority.

In reality, apart from its dependence on the demand, capacity, and strategies of enterprises, organizations or individuals, patenting also depends on the protection mechanism of patents, on the effort and costs of filing and examining patent applications, on the capacity of patent attorneys, etc. Although it is not possible to quantify the specific extent of dependence of domestic patenting on the IPR system, an effective system will contribute to

the encouragement of creative activities and thus to an increasing volume of domestic patent applications. Viewed in another way, a large volume of domestic patenting could be an indicator suggesting that the IPR system is operating well and that applicants (research organizations, universities, enterprises, etc) are aware of the value of patent protection.

2.5. The STI policy system of Vietnam

The STI policy system in Vietnam has been designed with a view to strongly boosting R&D and innovative activities. R&D activities and patenting are presented as quantitative targets that universities, research organizations and enterprises are to approach. In this way, domestic patenting is strongly dependent on STI policy. Although there are, in the system, many observers have also point out certain drawbacks and weaknesses.

First, the target of increasing 1.5 and 2 times the volume of domestic patenting in the respective periods 2011-2015 and 2016-2020 over 2006-2010 in the "S&T Development Strategy in the period 2011-2020" is not feasible in both the quantity and quality. The volume of domestic patenting seems to have nothing to do with the value of patents. Moreover, not all inventions can be patentable. In addition, this target will lead to a number of questions, like why is the number of 1.5 and 2 times set? Which fields of technology should be focused on? How many patents can be granted? etc. Still, if this target is approached effectively, the volume of domestic patenting will increase considerably compared with the figure presented for the past ten years. This can, to some extent, promote innovation activities.

Second, given that many STI policies have been issued recently, they are still not fully implemented in all sectors and the scope of supporting businesses has still been limited.

Third, cumbersome administrative procedures for approval of preferred policies discourage enterprises and make them less interested.

Fourth, the support mechanism is not clear and transparent; an "ask-give" approval mechanism still exists at various levels, and the implementation of certain policies has in practice been slow.

In summary, as discussed above, domestic patenting seems to be strongly dependent on the S&T system, the IPR system and the STI policy system, and less dependent on the NIS. The structure of the economy is likely to become more supportive of patenting when the shift of the economic structure from agriculture to manufacturing is accelerated. It can also be concluded that a larger volume of patenting would be beneficial in that it would signal that R&D activities of universities, research organizations, enterprises or individuals

in Vietnam are growing stronger, and that the awareness of the value of patent protection is increasing. And, of course, if more inventions are patented and if more of these are successfully commercialized, such a development would be highly beneficial for the Vietnamese economy. These would be useful arguments for policy makers to establish an appropriate policy towards increasing domestic patent applications.

3. Domestic patenting and policy implications

3.1. An appraisal of domestic patenting in Vietnam

Domestic patenting seems to have no direct link with the value of patents for the reason that not all inventions are patented. Moreover, the value of an invention or patent depends to a large extent on the technical level achieved in combination with the economic value gained from its successful commercialization. However, analyzing this is difficult because of data collection problems.

In the case of Vietnam, the country has not had a system of S&T indicators, and data on the revenues of companies - for example from the commercialization of their patents - is often not transparent, so that using quantitative estimation to identify the value of patents is not feasible. Instead, based on data collected from various sources, some qualitative arguments will be given regarding the volume of domestic patent applications and granted patents.

Table 2 below shows a low volume of domestic patent applications and granted patents during 2006-2013.

Table 2. Filed patent applications and granted patents in the period of 2006 - 2013

	Vietnamese		Foreign	
Year	**Applications**	**Patents**	**Applications**	**Patents**
2006	190	44	1970	625
2007	219	34	2641	691
2008	204	39	2995	627
2009	258	29	2632	677
2010	306	29	3276	793
2011	301	40	3387	945
2012	382	45	3959	980
2013	443	59	3726	1203

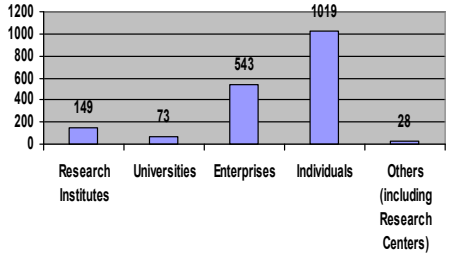
Source: NOIP's Annual Report in 2012 and data collected by authors

Although domestic patenting in Vietnam has occurred in all fields of technology as classified by the International Patent Classification (IPC) (Table 3), the volume of domestic patent applications and the ratio of granted patents to patent applications during the period of 2000 - 2010 were quite low.

Table 3. The volume of domestic patent applications and granted patents in the fields of technology under IPC in the period of 2000 - 2010

Section	Fields of technology	Volume of patent applications	Volume of granted patents
A	Human Necessities	402	65
B	Performing Operation -Transporting	325	55
C	Metallurgy	298	56
D	Textile, Paper	24	6
E	Fixed Construction, mining	179	42
F	Mechanical Engineering, Lighting, Heating, Weapons, Blasting	216	34
G	Physics	80	12
F	Electricity	74	7

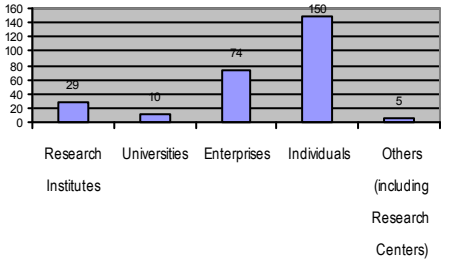
Source: Data collected by authors



Source: Data collected by authors

Figure 2. The volume of domestic patent applications in the period of 2000 - 2010

In Figure 2, the main actors in the S&T system - research institutes, research centers, universities and enterprises - account for a relatively small volume of patent applications, with respective shares of 8.2%, 1.5%, 4%, and 30%.



Source: Data collected by authors

Figure 3. The volume of domestic patents granted in the period of 2000 - 2010

If we look at the volume of granted patents (fig 3), research institutes merely account for 11%, universities 4%, centers 2%, enterprises 28%, while individuals account for the largest share with 56%.

Table 4. The volume of domestic patenting and patented inventions created by actors

App = Patent applications; Pat = Granted patents

Year	Research Institutes		Enterprises		Universities		Individuals		Others (including research centers)	
	App	Pat	App	Pat	App	Pat	App	Pat	App	Pat
2000	2		11		2		25	10	0	
2001	3		17	4	3	1	33	2	4	
2002	3	1	27	4	1		44	5	3	
2003	3		28	3	0	3	51	9	3	1
2004	6	3	33	9	1		65	11	1	
2005	20	2	39	11	0		129	14	0	
2006	20	3	51	13	12	1	116	25	4	2
2007	15	7	76	12	6		127	14	2	1
2008	13	2	59	8	9		127	28	1	1
2009	21	5	78	5	14	4	165	15	2	
2010	43	6	124	5	25	1	137	17	8	
Total	149	29	543	74	73	10	1019	150	28	5
2011	N/A	2	N/A	16	N/A	4	N/A	17	N/A	1
2012	N/A	8	N/A	11	N/A	6	N/A	21	N/A	0
2013	N/A	7	N/A	20	N/A	0	N/A	30	N/A	2

Source: Data collected by authors

There is unavailable volume of patent applications by different categories of actors in 2011, 2012 and 2013, but looking at the volume in the previous years and the granted patents in the three years, it can be estimated that no breakthrough in applications filed. The volume of patent applications during the period 2000 - 2010 is due, to a very large extent to filings by individuals as opposed to other actors who, in theory, should be the vital ones including research institutes, research centers and universities in inventive activities.

From the data presented in this subsection the following conclusions may be drawn:

First, the R&D activities of key actors like research organizations and universities and the management of R&D resources invested by the state's budget do not appear to be effective, or at least not as effective as hoped for.

Second, the key actors in R&D, like research organizations and universities or even enterprises, do not attach sufficient importance to file patent applications for protection.

Third, the protection and enforcement of IPRs is not strong enough to give adequate protection and to encourage all stakeholders in society, especially research institutes, research centers and universities, to engage in inventive and innovative activities.

Fourth, the basis for collaboration between industry and the public research sector is weak, partly due to the low volume of patent applications by universities and research institutes.

3.2. Policy implications

From above analysis, a set of policy recommendations for Vietnam emerges:

First, the analysis does not indicate a particularly important role for patents in encouraging innovation, except in a few sectors. Therefore, the first option for policy-makers in designing the general policy position of Vietnam would be to encourage enterprises, individuals, and research organizations to learn about the patent system. For example, special importance should be attached to educate SMEs in the use of the patent system, and to take measures to encourage patenting and technology licensing by universities and research organizations.

Second, a methodology should be built for evaluating and commercializing both non-patented and patented inventions in a long-term perspective. An objective evaluation of inventions and their commercialization should be carried out which will serve as a firm foundation for an effective national patent system. In the long run, it should be developed into an evaluation and commercialization system for all domestic inventions - a system which will then become an effective instrument for managers in monitoring patenting on the basis of their quality. Furthermore, the evaluation and commercialization system, with its quality assessment criteria, will also serve as the guiding standard for patent applicants to self-adjust to satisfy conditions for protection and adapt to the market.

Third, instead of focusing on increasing the volume of domestic patenting, as indicated in the target over the period of 2011 - 2020 in the National S&T Development Strategy, systems of S&T, IPR and STI should be

strengthened with the aim of training highly-advanced human resources and promoting R&D activities in research organizations and universities; enhancing the patent protection system through the provision of search tools for gaining access to patent information, the improvement of IPR enforcement; and developing practice-oriented policies with a focus on R&D activities and post-R&D activities.

Fourth, a system of patent-centered indicators complying to international standards should be built (including patent counts, patent citations, etc) and a methodology established to use them in combination with other scientific and technological indicators, such as R&D indicators (expenditures, number of researchers and personnel, etc) and economic performance indicators, for analyzing inventive and innovative activities of the country, covering sectors, firms, institutions and individual inventors, and for studying innovation processes.

4. Concluding remarks

This paper discussed whether it is desirable for a country like Vietnam to put in place policies aimed at maximize the volume of domestic patenting. The analysis of the economic structure of and state of development in Vietnam indicates that the volume of patenting is strongly dependent on the systems of S&T, IPR and STI policy, and less dependent on the NIS and the overall structure of the economy. In response to the question "Is the volume of domestic patenting in Vietnam cause for a concern?" the answer given in this paper is that Vietnam does not need to make a strong effort to increase the volume of domestic patenting per se. Instead, the S&T system should be strengthened; the IPR system should be developed with a focus on educating SMEs, and making enforcement activities more effective by strengthening the central role of the courts system; STI policy should be developed with a close view on the actual and future need for technology in the country. If these measures are effectively implemented, the NIS as a whole will also be strengthened and the industrialization and modernization of the country promoted. In addition, a system of technological indicators, including patent indicators, should be established as a foundation for monitoring and analyzing inventive and innovative activities./.

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