LEARNING TECHNOLOGICAL CAPABILITY FOR VIETNAM'S INDUSTRIAL UPGRADING: CHALLENGES OF THE GLOBALIZATION

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LEARNING TECHNOLOGICAL CAPABILITY FOR VIETNAM'S INDUSTRIAL UPGRADING: CHALENGES OF THE GLOBALIZATION

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Abstract:

The paper discusses technological capabilities in Vietnamese industry considering mainly the role of foreign companies. The support of technological change is limited by specific disadvantages of Vietnamese environment, mainly insufficient organizational and legal shortcomings. Thus the connections between foreign and local companies did not produce expected results. The diffusion of technological skills takes place via training process, transfer of tacit and codified knowledge, spillover to local partners and influence absorption capacity of the local market. The cases of ten foreign companies from five different countries are presented. Major conclusions underline the threats of global operations of international companies when they are not supported by enlightened policies of companies and governments in host countries on one side and present the opportunities for these countries economy on the other.

JEL Codes: F21, F23, O53

Key words: FDI, Joint-ventures, technology spillover, technological capabilities, tacit knowledge, low-cost-labor-trap, value chain, technical change

I. Economic integration, globalization and innovation system in Vietnam

1.1 Economic integration: opportunities and threats

Over the last decade, more and more developing economies have placed their development path squarely on an outward oriented strategy, including ever greater integration by them into the global economy. Economies such as Hong Kong, Taiwan and Korea that had earlier followed such a strategy had achieved spectacular results.

If developing countries have been following broadly the same outward oriented development strategies, why is it that some are achieving major benefits and others are not? A large range of recent studies identifies two critical and interrelated factors. The first is that while many countries can enter an outward oriented industrialization on the basis of low cost labor, relatively few have been able to use that base to move quickly and steadily up the value chain. They remain in what is referred to as the 'low cost labor trap'. The second factor is that low cost labor is not proving durable as a source of comparative advantage. Economies whose openness and greater integration into the global economy are based on products whose main factor advantage is low cost labor have found that there is usually another economy ready to offer labor more cheaply.

Moving up the value chain and avoiding the low cost labor trap relates to the changed nature of competition. Over the past several decades, competition has become much more innovation-based. Price-based competition continues to exist, but it relies increasingly less on the low wage labor than on the dynamics of cost reduction through process and organizational changes, improvement in product designs, quality control and the economies of scale and scope. To this list should be added the elements of marketing with emphasis on style, brand names and trademarks and of R&D modes that shorten dramatically product life cycles, accelerate incremental change and product technological ruptures. The massive change is caused by the widespread availability and use of information and communication technologies, the speed of scientific and technological advances, accelerating global competition, and much shorter product life and as a consequence of changing consumer demands. There is no doubt that Vietnam's successful integration into the global economy and its sustained success in international competition, in attempts to

upgrade industrial development level will depend increasingly on effective combinations of science, technology and innovation.

For the last ten years, Vietnam has been increasingly engaged in the international economic integration. More specifically, the country is committed to obligations and regulations of AFTA (ASEAN Free Trade Area), BTA (Bilateral Trade Agreement with the US) and negotiating to joint WTO. Apart from opportunities such as opening up of new market, access to new technology and capital investment, all these mechanisms pose new challenges for the economy. By involving in each of these frameworks, Vietnam has to abide to different commitments. Vietnamese firms have to be more competitive in an open market (or low tax environment). Already by 2003, 96% of imported goods and services must become duty-free in the framework of the AFTA. Other pressures come from increased and stricter demand of the intellectual property rights (IPR) issues. Certainly, competition will be more severe and most (if not all) protection mechanisms will be abolished sooner or later. As such, economic integration creates not only many opportunities but also threats for the Vietnamese enterprises and economy that any policy measures should take into account.

1.2 Challenges for innovation system

Vietnamese system of innovation has some strengths and weaknesses.[1] Vietnam has a quite large number of S&T personnel and institutions available to carry out R&D, although the age structure of research staff is highly skewed with averages falling between 55 and 60. More broadly, there are nearly one million graduates from approximately one hundred universities or colleges spread throughout the country and some 1.3 million have attended technical training institutes. This human resource and institutional base contrasts sharply with the situation in the vast majority of less developed countries when they sought to achieve rapid modernization. An extreme and often-cited example is that of Zambia which as it is claimed had less than two dozen university graduates and a handful of trained technicians at the time of its independence. At a minimum, it seems reasonable to conclude that there is an important and promising foundation on which to build.

However, there are a number of weaknesses and problems, including:

- The personnel classified as involved in R&D may be relatively numerous, but there are serious quality issues. Most received their training in a different era under a Soviet-oriented learning system with its emphasis on linearity between science and technology, on the technology of heavy industry and on state planning and control.

- Vietnam's S&T institutions tend to work in isolation, structured networks are few, and few opportunities exist for exchanges and shared learning. Too much focuses on theoretical studies (and still not very updated), and lack of practicability and technological experiences.

- The infrastructure for research is universally assessed as falling well below international and regional standards.

- Although some progress has been made during the past 3-5 years, linkages between Vietnam's R&D institutions and the productive sector are quite weak. Research continues for the most part to be 'supply driven' with little connection to the production needs of business and industry. Especially in the SME sector, the timely availability of essential professional advice through consulting services is largely unavailable [2].

- Very modest financing of R&D via the state budget is severely fragmented, resulting in such small amounts being available to individual research projects that any form of serious research is basically impossible.

In this context, the role of government is very important. Stronger linkage between industry and academic as well as R&D communities are the precondition for success of enhancing performance and competitiveness of enterprises and productive sector as a whole.

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[1] This assessment is taken from the work on the issue by Bezanson & Tran Ngoc Ca (2001).
[2] Efforts are being made to effect improvements here through technical cooperation provided by UNIDO.

The next section presenting how Vietnam attempts to acquire technological capability in industries will help to identify some tendencies and issues relevant to the process of industrial upgrading, as well as those affecting the learning process.

II. Learning technological capability in Vietnam's industries: some findings

2.1 Technological capabilities in Vietnam's industrial firms: general tendencies

An extensive literature in industrial economics demonstrates a high correlation between success in the industrial marketplace and what is referred to as technological capability (TC). Far from involving a single capacity, TC is interpreted as involving an extensive range of factors. These include capabilities from the ability to deal competently with an existing production process to the capacities to envisage, plan and direct a major technical change. Recent studies in Vietnam provide helpful indications of some key aspects of and barriers to TC and industrial learning experiences in national industrial firms (NISTPASS, 1996 & 1997; Tran Ngoc Ca & Le Dieu Anh, 1998; Tran Ngoc Ca, 1999). Those studies also suggest a range of policies and actions to increase national and corporate TC.

Using recent and considerable range of observations and studies[3], one can provide an evaluation of technological level of Vietnam's industrial firms such as:

On equipment and machinery:

- There is a low level or backward linkage from manufacturing and industry to capital and intermediate goods.
- Beyond the fact that there are weak linkages between R&D institutions and the productive sectors, the evidence indicates that in many instances the two are often in the mutual position of lacking the capabilities to connect with one another.

[3] 'Survey on technology market in HoChiMinh City,' HCMC Department of S&T and Environment, 1999; 'VISED Project on financial institutional reforms for S&T,' Vu Cao Dam and Nguyen Thanh Ha, 1996; 'Viet Nam Industrial Competitiveness Review,' DSI and UNIDO, 1998; 'Survey on level of technological capability of 6 industries,' NISTPASS, 1997 and 1998.

- A significant percentage of the managers of industrial SOEs continue to "think" in terms of fragmentation, of being self contained and as not requiring external linkages or support.
- The role of some state supporting organizations (particularly banks and financial authorities) remains inefficient and relatively ineffective in supporting enterprises through the provision of information, through clear and consistent policy signals and through credit in support of "reform."

On labor:

- Responses to a survey of more than 1,000 enterprises (including SOEs, private firms and joint ventures) indicated that there is a generalized shortage of appropriately trained and skilled technicians, engineers and labor, and that enterprises must contend with low productivity due to an excess workforce of unskilled and semi-skilled labor (Webster & Tauzig, 1999).

On training and management and competitiveness issues:

- The existing technical, engineering and management training institutions are not producing human resources with the skills and aptitudes required for firms needing to compete and upgrade.
- Management capabilities to manage firms in a competitive market economy are particularly lacking.

On other factors hindering technological change

- Other factors hindering technological change and upgrading that are indicated in these studies are the relative lack of financing, including access to credit on reasonable terms; an unsuitable and exceedingly complex taxation system; an unstable policy climate with regard to bureaucratic, financial and trade regulations which generates confusion, entails high costs and discourages new investment; and an inadequate legal framework.

More specifically, the works of Tran Ngoc Ca and Le Dieu Anh (1998), have provided principal research findings on TC and industrial learning experiences in Vietnamese firms. The studies revealed an extreme imbalance in development of

TC in firms. It was reasonably evident in areas of existing production methods and in managing minor technical change, factors associated with the early or entry end of the TC continuum. By contrast, the study found little evidence of TC in the areas of major technical change and marketing. This may not be surprising given the long history of command and control style of management in industry in Vietnam and the absence of the transition to a more competitive economy. Indeed, the study attribute this imbalance precisely to a lack of the learning opportunities that come from competitive pressure, and a consequent lack of a need to engage in marketing or to innovate products in terms of range and quality. The most developed technological capabilities are production and minor technical change.

Among the mechanisms by which TC is acquired, there were some indications that joint ventures and other connections between Vietnamese and foreign firms have not produced extensive learning in either marketing or the management of technical change (this observation will be discussed further in next section). Exactly the opposite conclusion emerged from earlier studies in Singapore and more recently in China. This finding has important strategic implications. It is, of course, possible that the difference between the experience of Vietnam and that of Singapore and China is more apparent than real and is due essentially to the relatively early stage of connections between Vietnamese and foreign firms. It seems that that *most* Vietnamese firms generally did not know how to go about utilizing partnership arrangements with foreign firms in order to learn TC. Equally, the mentioned study noted, not many foreign firms showed sufficient voluntary willingness to structure and facilitate the learning. A passive approach, they suggested, would need to be replaced with conscious and creative strategies by the individual firm to exploit the potential for TC learning, especially from foreign partners in the process of economic integration. Institutional factors (e.g. the vast difference in the traditions of SOEs and foreign firms, legal and regulatory regimes or financial impediments) may also have been contributing factors to the discouraging finding in the Vietnam studies.[4]

The studies also concluded that some government organizations over-intervene in industrial activity in some respects yet it simultaneously offer

inadequate support for other activities. There is little evidence of selective intervention in the form of explicit promotional policies such as tax rate reductions and exemptions, adjustable financial incentives, or flexible regulations on labor use and recruitment (Tran Ngoc Ca, 1999).

Finally, the studies drew attention to the relationship of ownership issues to TC accumulation in the Vietnamese context and, specifically, to the inequality within Vietnam's competitive environment. This has made it difficult for firms - especially privately-owned ones - to see to their existing businesses and, at the same time, to seek the learning required for marketing, international competition, and technical change. Private firms have less access to R&D, training and education facilities, are subjected to stricter financial and tax regulations, and have more limits placed on their opportunities to use bank credits. These are just some examples of inequality.

While both private and state-owned firms have their own problems, this factor strongly influences their learning.

2.2 Learning from foreign partners and issues of upgrading

A more specific study on learning mechanisms (Tran Ngoc Ca, 1999) has also identified some issues in relation to the linking up with foreign partners. In the study, this link is called as *foreign connections*. Learning through *foreign connections* is one of the most significant mechanisms used by the firms in this study. Though, the foreign connections mechanism was less helpful for learning technical change and marketing than for other capabilities. This finding is rather similar to those of some other studies on the textile and electronics industries of developing countries. For instance, Lall and Wignaraja (1994) found that German involvement in the garment industry of Sri Lanka did not lead to the development of higher level capabilities in the local firms. Both forms of German involvement (subcontracting and direct investment) stressed the efficient utilization of imported technologies rather than the development of independent design and process capabilities in the local partners. The strategy of these German firms in Sri Lanka was premised on the idea that investing in the development of higher technological capabilities in local Sri Lanka firms would

[4] Some more detailed case studies in following section will try to

be uneconomical for them. As a result, the foreign connection proved necessary for starting up some technological capabilities, but was not sufficient for upgrading their TCs. A similar study by Mytelka (1992) of the textile industry in the Ivory Coast found that reliance on foreign companies did not help local training and that, due to a preference for using expatriates rather than local staff, no learning took place.

In a more optimistic study, Ernst (1995) shows that Korean electronics firms used their connections with foreign companies to learn important knowledge, during the initial period, about investment and production activities. In some cases they could even learn adaptive engineering skills, but they still could not learn about major technical change nor develop their own R&D competence. Evidence from other developing countries suggests that this situation is typical when using foreign connections for technological learning. The Vietnamese firms in the mentioned study seem to be in a similar situation.

In a more or less positive case of technological transfer and learning, Toyota Vietnam has set up a training center for its Vietnamese staff in addition to sending them to Japan for training (Phan Kim Chien, 2002). But even though, the local staff is mainly for production, repairs, and maintenance. Although it may be likely that foreign partners sometime hesitate to help Vietnamese firms develop their relationship beyond simple subcontracting, there are also some other reasons for this problem. To conclude that this is a conscious strategy deployed by foreign companies in Vietnam requires further exploration which this paper will try to address in section III.

2.3 Issues of technological innovation

Overall, the technological innovation in Vietnamese firms has encountered several main problems. Studies on policy measures to promote technological innovation in enterprises have produced some findings.[5]

Financial policy measures are still not conducive, especially while considering the differences between various policy making organizations, and between documents regulating the issue. However, this policy environment has been improved much for the last few years and addressed quite extensive range of problems in encouraging

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address this issue.

technological innovation of firms. The most outstanding issue of financial policy is the rush of introducing some important law and documents (such as on VAT), the policies are still vague, too general and lack of understanding the specific nature of innovation. As such, the policies remain ineffective.

More important are the policies related to human resources development: training, recruiting ad using the staff. Enterprises view is that this kind of policy is more critical than financial one. Policy environment related to human resources are under influence of more ministries and government agencies and more complex than the others. Thus the need to improve this policy environment is more urgent.

. Motivations of firms to innovate (market pull) need a balance on the side of technology push. Without taking into account demand side policy (market pull factors), the impact of government policies (Financial and human resources) would be limited.

Among technology push policy measures issues, there are also range of other aspect to be considered, such as lack of intermediary organizations/actors for innovation, inefficient system of consulting firms, and weak mechanisms to forge linkage between enterprises, universities and research institutes.

III. Global production network and opportunities for learning: some case studies

3.1 Patterns of learning from foreign companies

To clarify more in details specific spillover effect from foreign companies to Vietnamese organizations and accordingly, learning (if any) by Vietnamese companies in this process, a sample study has been conducted with some foreign companies active in Vietnam.

[5] Tran Ngoc Ca, (2000)

3.1.1 Hewlett-Packard Vietnam (HPVL).

HP Vietnam (Hewlett-Packard Vietnam Ltd. - HPVL) was formally formed in 1995 as a 100% foreign-invested company with two offices in Hanoi and HCM city. Combining a staff of forty able, experienced employees and an energetic, creative board of director, HP Vietnam has quickly positioned itself in the Vietnamese IT market. Today, a distribution network of 3 general agents and 110 agents have been established, accompanied by two warranty centers in Hanoi and HCM city and a nationwide service network.

Guided by HP's famous vision known as the HP Way, HPVL devotes to customer service and product support. During the last 4 years, the PC World magazine has chosen HPVL as running the best supporting and servicing team. With its highly skilled engineers, this unit can provide the best quality service to all of HP's customers.

HPVL doesn't manufacture in Vietnam but mainly offers products and accompanied services. The main training activities are for its staff and customers as part of package deals, through which, HP has indirectly transferred such technologies as corporate information management software, web management, UNIX, Window NT, Internet, etc. to its customers. In particulars, HPVL can provide different programmes specific to customers need, including classroom training, on-the-job-training, and specialist supervision. Customers learning capacity, however, still depends largely on their absorption ability and the utilization of HP's specialized services. HP's standardized system is applied in every customer service activities, linking customers with the local customer training center, thus enriching their study resources.

To sum up, HPVL comes into this case as a company that doesn't produce in Vietnam yet contributes to increasing Vietnam's technological capability through the training of its own employees and its customers'.

3.1.2 Intel

According to Mr Than Trong Phuc, Intel's chief representative in Vietnam, the company's strategy is to encourage the demand for computers with installed Intel

chips. Intel therefore aims at constructing a PC making factory right in Vietnam in order to apply its newest technology and reduce prices, which could drop to an average of around $300.

In the mean time, however, Intel has just maintained a representative office and not yet brought into Vietnam production and trading activities. Even distribution is mainly done through the channels of Vietnam's sales agents or other South East Asian countries', particularly Singapore. In other Asian countries, Intel has been able to set up its Local Official Equipment Manufacturer (LOEM). When this system is built up in Vietnam, Intel will be able to introduce 'Made in Vietnam' computers in addition to microchip distribution.

In this context, Intel's contribution to enhancing Vietnam's technological capability is restricted at the level of training for a small number of its distribution network's staff. Until the launching of real production activities, technology transfer and other learning effects will still be on a small scale. Besides, insofar as the searching of a suitable Vietnamese partner for such a factory is concerned, many factors will need to be taken into account, among which the partner's technological capability in terms of manpower, facilities, quality control systems are just a few.

3.1.3 Fujitsu Vietnam

A big computer and telecommunication company from Japan, Fujitsu has been present in Vietnam since 1995 with the establishment of Fujitsu Computer Products of Vietnam, Inc. (FVC) in the Bien Hoa II Industrial Park of Dong Nai province. In 1997, another joint venture, VNPT-Fujitsu Telecommunication Systems Ltd. was set up in Hoai Duc, Hatay in cooperation with the Vietnam Post and Telecommunication Corporation to produce telecommunication equipments. In 1999, another company, this time 100% invested by Fujitsu, was formed in Hanoi-Fujitsu Computer Systems of Vietnam Ltd (FCSV). This company specializes in web issues, service, software development and e-commerce. In total, Fujitsu has invested more than 212 millions USD in Vietnam, employing more than 3000 workers. In 2000 only, revenue from export amounted 687 millions USD.

At such level of investment, Fujitsu's participation in technology transfer through training and other forms of technology diffusion has proved to be quite productive. The printed circuit board factory in Bien Hoa (PCB) is organized based on Japanese management techniques and technological processes. Professional trainings for the newly recruited in production and technology operation take place

both in Vietnam and at its bases in other Asian countries, including Japan. As a result, Fujitsu Vietnam has succeeded in transferring technology to employees working in its 100% invested factories and bases. The same training activities can also be observed in joint ventures, actively transferring knowledge and experience of production organising like those of JIT (Just-In-Time), quality and cost control to the Vietnamese side.

However, as the Bien Hoa factory exports all of its products to Fujitsu's bases in other countries while importing all inputs, technology transfer mainly resides within the factory and has not yet grown out of the boundary to create useful backward linkage effects with other Vietnamese electronics providers. The two companies established later on have formed more frequent links with domestic agencies, facilitating better results in improving the Vietnamese's technological ability.

3.1.4 BP Petco

This is a joint venture between British Petroleum (BP) and Petrolimex, in which BP contributed 65% of capital. Its activities include producing and distributing lubricants for both the domestic and exported markets. The venture totals USD 48 millions in capital and lasts 30 years.

The venture operates on the principle of equality; the board of directors is nominated from both sides to oversee the project from the start until completion and commissioning. The working principles are agreed upon and strictly implemented, including BP's internationally accepted regulations on trainings and employment.

The management and development of manpower is carried out in line with both the local and international standards. The venture coordinates with the Department of Science, Technology and Environment (DOSTE) of HCM city and the National Relief Committee to organise training in clean fuel sources, controlling and treating oil spill. Regarding health safety, trainings are also given on hazard controlling, contingency planning, fire and explosion protecting with the supervision by foreign experts.

3.1.5 Unilever Vietnam

Unilever Vietnam has had a 5 years operation in Vietnam. In 1995, two joint ventures were established with Lever Haso in Hanoi and Lever Viso in HCM city. In 1997, two more companies, Wall's ice cream and the joint venture Elida P/S went into operation. In 2000, Lever Haso and Liver Viso were merged to form Lever Vietnam, which later bought Bestfood Company. Today, the total capital has reached $100 millions.

In terms of technological transferring, Unilever has delivered modern technologies to all of its factories, part-producing units, and the majority of its distributors. It has run training sessions both inside and outside the country for Vietnamese employees ranking from head of departments to normal workers. Regular meetings and discussions are also held with Unilever's research centers all over the world on science and technology exchange. Significantly, Unilever has brought to Vietnam the best practice it derives from the region. Not least, as a chemical company, Unilever has shown concerns towards a 'clean and green' working environment-the waste treating system installed in its factories are considered the best in Vietnam. The four companies formed or jointly formed by Unilever have all been issued ISO 9002 certificates; Lever Hanoi is also given ISO 14000 certificate.

Apart from creating technology learning opportunities for its own employees, Unilever Vietnam has also established and supported a network of medium and small agents and distributors, providers of raw materials, packages and part-providers. The common problems often faced by this network's members are limited finance, restricted technical capabilities, out-dated management systems and operating styles. In all, strategic planning is lacked, which leads to companies that are weakly reliable, poorly regulated, and almost unable to meet quality standards. Given this situation, Unilever has implemented a set of policies to stipulate a more profitable performance for those businesses. The measures include providing capital at zero interests, acting as a guarantee for bank loans, providing production plans and facilities, transferring techniques and formulae used in the production of soaps, washing powders and other home cleansing products. Training is also provided on products' standard requirements, analysing process, sampling process, allowed quality levels (AQL), hygiene principles and standards.

The learning effects that distributors, part-producers and agents could derive from Unilever's supporting policies are quite significant. However, there remain some constraints to the learning process, namely a bureaucratic and stagnant working

environment, certain policies restraining growth, etc. Government's support is needed to simplify the formalities, and so are efforts from medium and small businesses to perfect themselves and determine their business development directions.

3.1.6. Mercedes-Benz Vietnam

Mercedes Benz 's presence in Vietnam was first marked with the establishment of Mercedes-Benz Vietnam Ltd (MBV) in 1996. The company has soon paid central attention to domesticating its products (buses and coaches) and developing technology cooperation with domestic companies. Currently, the majority of work done is in domesticating components and spare parts (40%) of medium sized buses (34 seats). Specifically, they can be broken down to making tyres, chassis batteries, screens, bus frames, accessory packs, seats, and instruction equipments for model E240. In terms of cooperation, however, only a part-by-part programme could be carried out to allow MBV's Vietnamese partners to meet its required standards. As programmed, MBV has provided guide and training to use production processes in order to maintain the quality of products.

In the future, with some new products, MBV plans to form linkages with providers all over Asia to cross-supply spare parts, accessories, and components. For example, to launch a new model, MB has set up a system connecting purchasing networks namely Asian Procurement Team-APT. In this system, there are suppliers from nine Asian countries, each specializes in one product. The Vietnamese, as part of this link, will produce seats for the new model. Moreover, those providers from the ASEAN countries, given its cooperation framework, can also take part in the AICO (ASEAN industry Cooperation) product exchange, boosting cooperation and increasing product domestication rates, thus intensifying their technological capabilities and the linkages.

In general, the presentation of MBV in Vietnam has helped both the Vietnamese staff working for MBV as well as for its Vietnamese partners to increase their
technological capabilities.

3.1.7 Sony Vietnam

Sony's penetration of the Vietnamese market started quite early. Since the mid 1970s and right after the end of the war, it has been seen in some forms of cooperation with Vietronics' enterprises. Nowadays, Sony Vietnam has become an electronics producer in Vietnam, one with the need to have access to domestic suppliers in order to meet market demands timely.

However, there are very few qualified suppliers and they even fall short of the needed technology that can match Sony's requirement. Sony seeks to solve this problem by concentrating on training. By coordinating with the mother company in Japan, Sony has provided training programmes to agents and distributors in Vietnam in the fields of quality control and analyzing and solving technical problems.

Besides, Sony has also provided local businesses with production facilities such as those used to make plastic frames to cover engine bodies and TV's backs; Vietronics Tan Binh, for example, receives equipments from Sony to produce mechanical chassis, remote controls and speakers, etc.

A third type of support from Sony to local businesses is through the monthly auditions held by Sony Vietnam and annual auditions by the mother company. The management system in general: material management, stock control and management, stock flows, production process management systems, quality management systems, all of these operational management's technical know-how have been transferred to the Vietnamese partners.

Most significantly, in helping Vietnamese enterprises effectively entering AFTA in 2006, when Vietnam has to accept the common tariff reduction based on CEPT's framework, Sony has successfully introduced the Vietnam Local Industry Upgrading Project by Sony (V-LIUPS), within AICO. V-LIUPS provides support for production and technology, improving quality management in order to level the qualities of Made-In-Vietnam goods and international standard.

The process of supporting domestic enterprises can be imagined as following these steps:

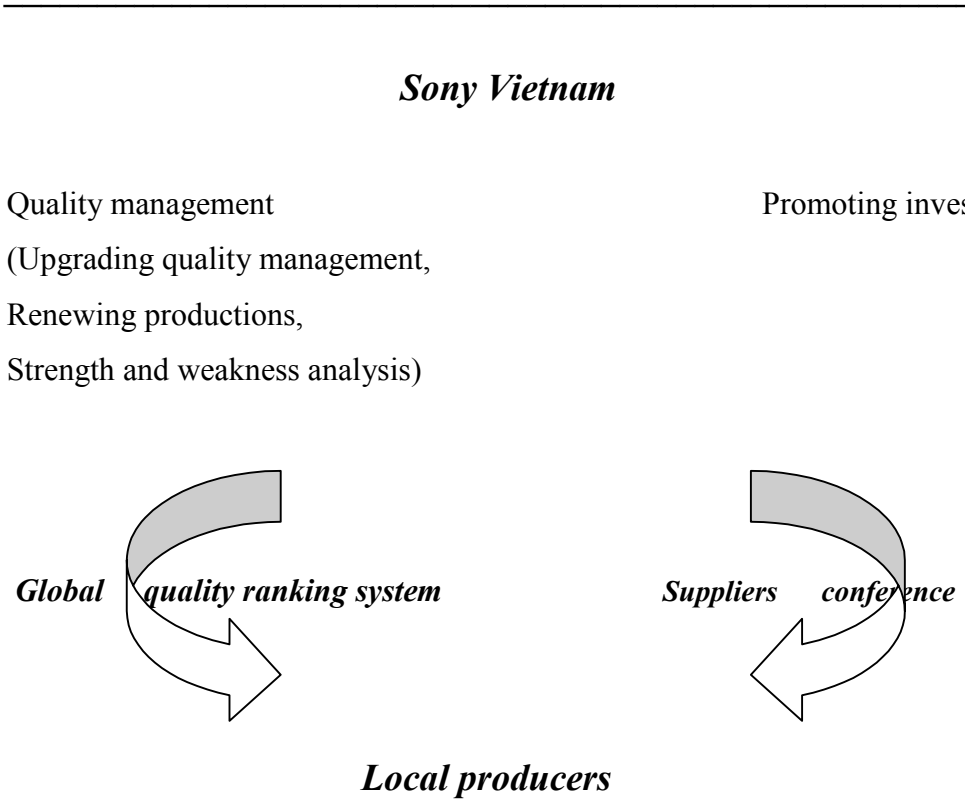
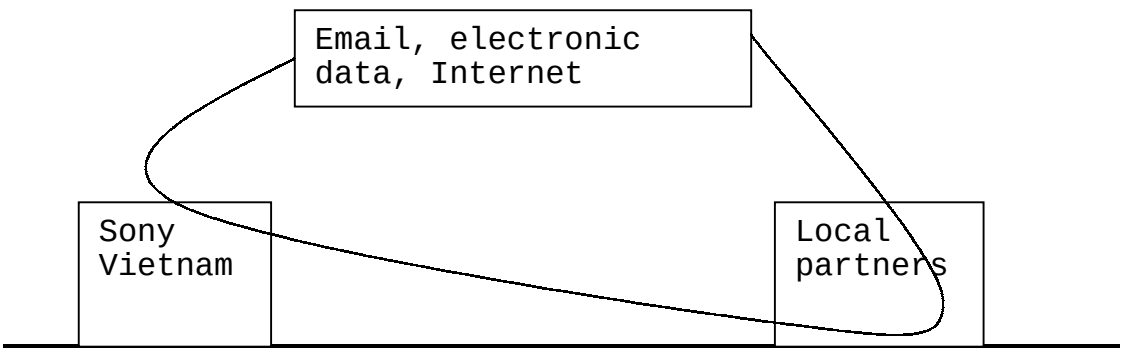


Figure 1: Sony's form of supporting

Recently, Sony has also brought into practice an electronic working system to support the cooperation between Sony and the local enterprise.



In the operating process, Sony Vietnam is aware of the many problems that need to be solved. Firstly, it is the provision of market information on buyers, legislations and regulations of foreign markets, etc. Secondly, organizations that give training in doing business, commerce etc. have to provide enterprises with basic knowledge. The regulations on public finances are also important, as businesses (mainly medium and small ones) are often lack of capital. Lastly, the operation of trading houses is also needed. According to Sony's view on government-foreign companies coordination to support small and medium businesses, a model could be set up as follows:

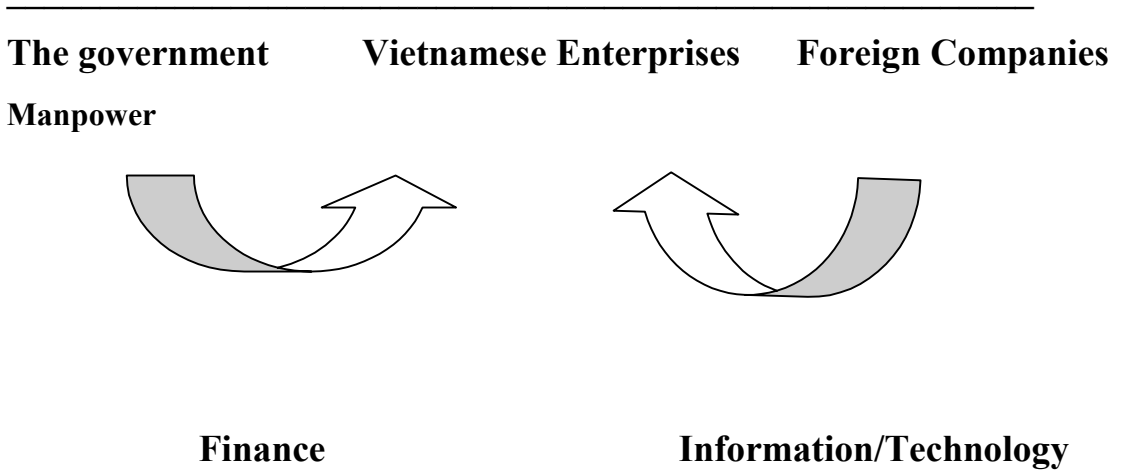


Figure 2: Sony's support relationship

3.1.8 Air France-Airbus Alliance

Air France's main business in Vietnam is to cooperate with Vietnam Airline in the upgrading of technology and air-service, among which an important issue is the maintenance and repair service of Airbus A320. The French Republic's government and the French General Directorate of Civil Aviation have provided financial help and technological advisory in the preparing important regulations.

The transfer of maintenance technology of AF and Airbus to Vietnam Airline (VNA) has been marked by a number of stages. In December 12th 1993, the first generation of VNA engineers was sent to France to attend a course reconciling skills

of maintaining outdated Russian aircrafts and Airbus 320. This is a streamlined training course, carefully organized in many aspects such as the syllabus, conductors, and facilities. The programme includes the study of technical English, new aviation techniques, system structures and operation properties, and airplane parts. Many who took part in this programme have become the core of the A320 maintenance teams.

From July 1994 to June 1996, participants accomplishing the course joined the practical training phase with AF's wet lease teams (who are rented out together with the aircrafts). This was a most important time for the Vietnamese engineers, working with AF's maintenance team. From July 1996, VNA took in a team of 10 A320 aircrafts as part of a ten-year dry lease (aircrafts only). In this period, A76 engineers had chance to work with foreign partners like Airbus, RGA, and FLS.

After the period of July 1997 to June 1998, the whole technology operation management system of VNA in general and of the A76 aircraft factory in particular had been changed in line with a new management model and new, articulate regulations. From July 1998 onwards, A76 has been able to operate independently, its partners' experts acting only as advisors.

Today, Vietnamese engineers have taken on all of the remaining technical positions. The factory has been certified by such international bodies as Bureau Veritas to maintain and operate A320 aircrafts. This technological ability has been passed on to other factories such as the A75, which is currently in its process of upgrading Boeing 767 maintenance technology.

Analyzing current trends

The eight cases show an overall picture in which technology transfer from foreign companies to their Vietnamese employees and their partners' has taken place in a positive way. The characteristics and effectiveness of technology spillover and the learning process, however, differs depending upon circumstances. Certain companies like Unilever and MBV, given their long-term strategies, have invested significantly in training to support their business purposes; others such as HP or Intel haven't matched that level due to their low degree of market penetration. Nevertheless, regardless of the outward results, non of that companies has publicly shown a policy that doesn't support Vietnam in its learning process. Although those technologies that

have been transferred to the Vietnamese may have not reached the desired level of integration, their effects in improving business performance can't be neglected.

Forms of linkage channels of foreign companies

Companies / Channels	HP	Merce--des	Sony	BP Petco	Air-France	Fujitsu	Intel	Unile-ver
Investment forms in Vietnam	100% BCC	JV	JV	JV	BCC	100% JV	100% BCC	JV
Technology spillover Channel 1	X	X	X	X		X	X	X
Technology spillover Channel 2	X	X	X	X		X	X	X
Technology spillover Channel 3					X			
Companies with strategy on training and transferring technology		X	X	X	X	X		X

Source: Results of the project

Note: BCC : Business Cooperation Contract
JV : Joint Venture
100%: 100% foreign owned investment

Two in-depth case studies have been chosen to elaborate further the issues of learning from foreign companies operating in Vietnam. The first is Honda Vietnam, a joint venture between Honda (Japan), Honda Thailand and Vietnamese company. Second case is also a joint venture between Alcatel and Vietnamese company. This would help to understand their relationship in upgrading industries in Vietnam.

3.2 Case of Honda Vietnam

Honda Vietnam Co., Ltd. was established on March 22, 1996 as a joint venture between Honda Motor of Japan (42% of prescribed capital), Asian Honda Motor (28%) and Vietnam Engine and Agricultural Machinery Co. (VEAM), Ministry of Industry (30%). Total investment was 31.200.200 USD with main products being motorcycles Honda Dream, and Honda Future. Planned capacity is 450.000 pieces/year in 2003, with labor of 2000 people (2003). In fact, up to August 2000 Honda has invested 51.500.000 USD. It was planned that the company will sell about 200-300 thousand items per year.

Main findings from this case study are as follow:

- Joint venture has trained extensively its staff and learning effect is quite significant (technology spillover from foreign partner to Vietnamese partner of the JV, channel 1 in the Figure)
- Technology spillover from JV to other Vietnamese organisations (in this case the suppliers of material and inputs for Honda production) also happened actively, and learning effect is significant (channel 2 in the Figure)
- However, other kind of organisations (research institutes, universities) do not benefit much from this spillover process.
- Learning occurred not only in technical issues, but also in management experiences and knowledge.
- Next to official and formal training, learning by doing and apprenticeship kind of training is no less important. In many cases, tacit knowledge has been learnt as equally as other codified knowledge through training material.
- Officially, Honda Vietnam has no limits on technology transfer, but in reality, the company still applied some implicit barriers to diffuse too widely those knowledge which is considered as core competence of Honda (including experiences on management practice, know-how of production organization).
- Technology spillover and involvement of Vietnamese enterprises in cooperating with Honda Vietnam has been limited by factors such as low technological capability, obsolete equipment of Vietnamese partners, etc. In

this case, Vietnamese enterprises themselves are not ready to take the learning opportunities brought by Honda that results in poor learning effect.

- Policy environment seems not significantly affected on technology spillover of Honda Vietnam. Product localization policy of Government is one of such factors that result in technology spillover, improving learning effect and increasing technology capability for Vietnamese partners.

3.3 Case of Alcatel Network System Vietnam (ANSV)

Alcatel Network Systems Vietnam - ANSV was created on 5/7/1993 as a JV between VNPT (48,8% capital) and Alcatel-CIT (51,2% capital). The company has 96 staff, working in three main areas:

- Completed-Knocked-Down manufacturing digital switchboard Alcatel 1000 E10, with capacity of 250.000 numbers/year

- provision of telecom services for switching network

- R&D in software solution for telecom network system

More recently, Alcatel has shifted to production of printed circuit board (PCB) in Vietnam, using surface mounted technology (SMT). Investment for this advanced technology required a substantial amount of capital (more than 10mln USD for equipment and training).

Main findings from this case study are as follow.

- ANSV join venture has extensively trained its staff and learning effect is quite significant (channel 1 in the Figure). In particular, Alcatel Vietnam has effectively trained a software staff specializing on telecommunication systems who are able to serve Alcaltel's need in software elsewhere.
- In channel 2, technology spillover from ANSV join venture to other partners has not been as extensively as Honda Vietnam has. Because ANSV mainly used imported parts and elements and little of local supplies, formal technology spillover and learning effect by this channel is quite limited.
- Learning occurred not only in technical issues, but also in management experiences and knowledge.

- Other types of organizations (research institutes, universities) do not benefit much from this spillover process. The intention of the Department (Ministry) for Post and Telecommunication to encourage linkage by locating JV next to the Research Institute for Post and Telecommunication was not realized.
- Next to official and formal training, learning by doing and apprenticeship kind of training is no less important. In many cases, tacit knowledge has been learnt as equally as other codified knowledge through training material. In the ANSV case, lots of tacit knowledge has been codified and re-formulated for the purpose of continuous learning.
- Technology transfer by formal contracts has not been smoothly implemented with many problems and it has just begun as a result of a patient negotiating process.
- The ANSV's difficulties in technology transfer have been assessed differently based on which point of view and which right is considered. Acaltel has its limits and has not transferred the most up-to-date and core technologies in the communication system for Vietnamese partner.
    - Policy environment has some effects on ANSV technology spillover. Tax, financial policy and research funding policy among the difficulties which have been pointed out.

The spillover and learning in these cases is presented in Figure 3.

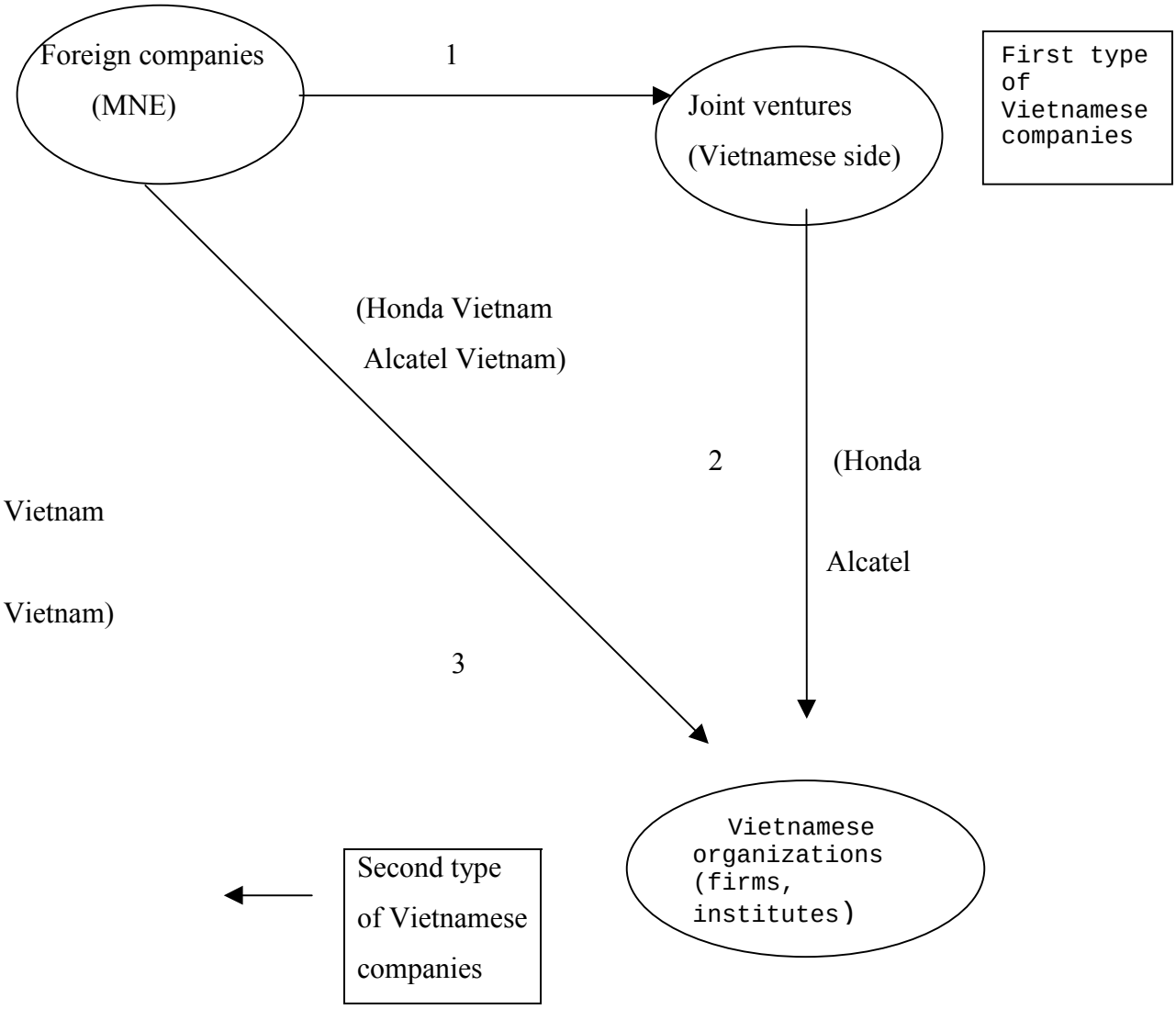


Figure 3. Channels of technology spillover

Channel 1: Technology spillover within JV: from foreign to Vietnamese partner (staff).

Channel 2: Technology spillover from JV to Vietnamese organizations

Channel 3: Technology spillover directly from multinationals to Vietnamese organizations

Results of these studies have confirmed that it is possible for Vietnamese companies to learn from foreign partners by participating in the global networks of producers, distributors, sellers, etc. Provided that the host country firms are ready and well prepared for learning and have conscious strategy to upgrade their technological industrial capability, the foreign partners can be available for knowledge resources. Certainly there are areas of strategically technological importance that foreign companies (especially big multinational enterprises) would keep their dominance.

IV. **Conclusion and implications**

It is clear from our discussion that the process of globalization has created new setting for the world economic and social development. According to a prominent Nobel Laureate for Economics Joseph Stiglitz (2000), globalization has created benefit for handful countries, mainly from East and Southeast Asia. Despite this still controversial point, it is clear that the globalization has brought many new opportunities for some (certainly not all) developing countries and at the same time new challenges for majority of economies in developing world. Some politicians even consider these challenges as threats to their economic welfare and political and social stability. In this context, only those countries and firms equipped with vision and determination can devise suitable policies and strategies to cope. However, there is also always a window of opportunity for developing countries and firms to learn, to utilize the potential opportunities that the globalization has brought.

The firms' action is crucial in this process. Carefully designed strategy, well-thought plan of action and investment for learning should help the firms know how to become more competitive, to upgrade their industrial base and technological competitiveness, to improve business performance. To become a learning organization, the capability of firms' managers to learn is key factor. Vietnamese experiences presented in this paper or elsewhere proved that depending on the specific firms, managers behavior, the results could be quite diverse and industrial and technological upgrading can be and should be strengthened by engaging more in the global economic integration.

Having said that, the firms' action alone is not sufficient. The government role in introducing conducive policy measures is required to create a favourable

environment for firms, first of all in innovation activity. Policy support for the government should gear to facilitate, to guide rather than to control business of enterprises. In a right policy environment, both host country firms and international enterprises could win.

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