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Viet Nam Industrial Competitiveness Report 2011

This document is the result of a collaborative effort between the Ministry of Industry and Trade of Viet Nam (MoIT) and the United Nations Industrial Development Organization (UNIDO).

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FOREWORD

The year 2011 marks a milestone in the process of Viet Nam's industrial development and modernization. The adoption of the strategy of socio-economic development 2011–2020 for Viet Nam by the Eleventh Party Congress offers many opportunities, but also poses several challenges for further development. Notably, Viet Nam has achieved relatively high industrial growth in recent years, with the value of industrial production accounting for a significant share in the country's economic structure. However, in comparison with other economies in the world in general, and in East Asia in particular, where competition is most intense, the quality of the underlying drivers for industrial development in Viet Nam still needs to be further strengthened.

In this context, the release of the Viet Nam Industrial Competitiveness Report 2011 (VICR 2011) – a result of the collaboration between the Ministry of Industry and Trade of Viet Nam (MoIT) and the United Nations Industrial Development Organization (UNIDO) – is timely as it raises important policy implications. Building on UNIDO's well-established methodology, the report focuses on the manufacturing sector to assist policymakers in identifying key areas of intervention to boost industrial competitiveness. It compares Viet Nam's industrial performance to that of other countries in the region and sheds light on strategic paths to deepen the industrialization process.

The VICR 2011 highlights two major issues of concern: the evaluation of the role of trade liberalization in recent years for economic and productive restructuring, and the need for a re-formulation of industrial policy and strategies to take account of national priorities, as well as of global threats and opportunities. It also considers possibilities for building linkages among industrial sectors to increase the manufacturing value added of existing products and to enter new and more dynamic sectors. The report hence assesses the capabilities of Viet Nam's industrial sectors to participate and compete in the international context. We sincerely hope that the VICR 2011 will be deemed a useful document which supports policymakers in the formulation of industrial and trade policies that meet the requirements of the realities of the new stage in Viet Nam's industrial development.

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Manuel Albaladejo, UNIDO staff and programme manager, was the main author and provided the conceptual framework and technical guidance to the drafting team. The Industrial Competitiveness Group (ICG), an inter-ministerial working group set up and trained by UNIDO, was responsible for the analysis and writing of several chapters of the report. The team was composed of Ms. Do Phuong Dung (official at ICD), Mr. Nguyen Viet San (principal official at ICD and national programme coordinator), Ms. Luu Thuy Duong (official at ICD), Ms. Dinh Thi Hoang Yen (official of the Planning Department at MoIT), Mr. Le Phan (official at the Central Institute for Economic Management of the Ministry of Planning and Investment) and Ms. Le Thanh Thao (National Programme Officer, UNIDO).

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GLOSSARY

AFTA	ASEAN Free Trade Area
ASEAN	Association of Southeast Asian Nations
ASEAN-4	Original members less Singapore (Malaysia, Indonesia, Thailand and the Philippines)
BTA	Bilateral Trade Agreement
CEFT	Common Effective Preferential Tariff
CIEM	Central Institute for Economic Management
CINDE	Costa Rican Investment Promotion Agency
CIP	Competitive Industrial Performance
COMTRADE	United Nations Commodity Trade Statistics Database
DNV	Det Norske Veritas
EPA	Economic Partnership Agreement
EPZ	Export Processing Zone
FDI	Foreign Direct Investment
FIEs	Foreign Invested Enterprises
FSC	Forest Stewardship Council
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GLOBAL G.A.P.	Global Good Agricultural Practice
HT	High-Tech
ICT	Information and Communication Technology
IDA	Ireland's Industrial Development Agency
IMF	International Monetary Fund
INDSTAT	UNIDO Industrial Statistic Database
IPA	Investment Promotion Agency
ISO	International Organization for Standardization
ITC	International Trade Centre
LT	Low-Tech
MNCs	Multinational Corporations
MoIT	Ministry of Industry and Trade
MPI	Ministry of Planning and Investment
MT	Medium-Tech
MVA	Manufacturing Value Added
NAFOSTED	National Foundation for Science and Technology Development
NCSTP	National Council for Science and Technology Policy
NES	Not Elsewhere Specified
NICs	Newly Industrialized Countries
OPEC	Organization of Petroleum Exporting Countries
RB	Resource-Based
RIA	Regional Integration Agreement
R&D	Research and Development
SEDP	Socio-Economic Development Plan
SITC	Standard International Trade Classification
SMEs	Small and Medium-Sized Enterprises
SOEs	State Owned Enterprises
S&T	Science and Technology
TDA	Technology Development Agency
TLO	Technology Licensing Offices
TNCs	Trans-National Companies
TTO	Technology Transfer Offices
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
VASEP	Viet Nam Association of Seafood Exporters and Producers
VCCI	Viet Nam Chamber of Commerce and Industry
VCR	Viet Nam Competitiveness Report
VICR	Viet Nam Industrial Competitiveness Report
VIETRADE	Vietnamese Trade Promotion Agency
VTE	Vocational and Technical Education
WDI	World Development Indicators
WTO	World Trade Organization

VIET NAM INDUSTRIAL COMPETITIVENESS REPORT 2011

Section A:

SETTING THE SCENE

1. Introduction

Viet Nam's efforts to shift from a centrally planned to a market-led economy are paying off. Not only has Viet Nam been one of the fastest growing economies over the last 20 years, this growth has also sharply reduced the incidence of poverty. Viet Nam is increasingly integrating into the global economy and is becoming a hub for potential national and international investors. Membership of ASEAN in 1995 and of WTO in 2007 has contributed to Viet Nam's reputation as an advocate of trade liberalization and integration.

But how much has industrialization contributed to Viet Nam's economic growth and export success? And what is the role of manufacturing and structural change in the country's economic future? This report contends that industrialization lies at the core of Viet Nam's economic growth. This is in line with empirical and historical evidence which shows that a fast growing economy needs a vibrant industrial sector. Boosting the manufacturing sector is likely to be even more important in the future if Viet Nam is to create more wealth and employment. This report argues that structural change towards given strategic technology intensive sectors can speed up the industrialization process, thus establishing conditions conducive to sustained growth.

In recent years, a number of studies have examined Viet Nam's macroeconomic competitiveness. The Viet Nam Competitiveness Report 2010 of CIEM and the Lee Kuan Yew School of Public Policy in Singapore touched upon all aspects of Viet Nam's economic competitiveness (CIEM, 2010). In 2010, the Ministry of Planning and Investment (MPI), together with UNDP, launched a study which looked at the specific constraints and opportunities Vietnamese firms face in improving their competitiveness (Nixson & Walters, 2010). A 2008 Harvard study presented regional policy lessons for Viet Nam's socio-economic development (Anthony et al., 2008).

All of these reports have significantly contributed to policy dialogue in Viet Nam. The Viet Nam Industrial Competitiveness Report 2011 (VICR 2011) focuses exclusively on the manufacturing sector, hence distinguishing it from other reports. It makes the strong case that Viet Nam needs an industrial policy aimed at structural change towards high value added manufacturing sectors to sustain current growth levels in the long run. The report aims to contribute to the existing policy debate by:

- Providing a conceptual framework for understanding the drivers of industrial competitiveness in Viet Nam;
- Positioning Viet Nam in the international context through regional benchmarking in all dimensions of industrial performance;
- Identifying industrial bottlenecks which policy can address;
- Making specific recommendations for Vietnamese leaders.

1.1. UNIDO's methodology and institutional capacity building

UNIDO has developed a series of industry-related dimensions, indicators and indices to assess national industrial performance. This methodology is the fruit of years of research and advisory work carried out under the guidance of the late Professor Sanjaya Lall of Oxford University. These indicators have been widely used by policymakers and the private sector around the world. UNIDO's Competitive Industrial Performance (CIP) index captures 'the ability of countries to produce and export manufactured goods competitively' (UNIDO 2002–2003: 42) in a simple, intuitive combined measure.

The central tenet of UNIDO's approach is to build institutional capacity for policy design and implementation. Within the scope of the programme, UNIDO sets up and trains inter-ministerial intelligence units to produce analytical reports on their own. The VICR 2011 is the result of UNIDO's institutional capacity building programme in Viet Nam. The Industrial Competitiveness Group (ICG) set up at the Ministry of Industry and Trade (MoIT) has been the driving force behind the production of this report.

The report is structured around four sections: a) theoretical background to the analysis; b) analysis of Viet Nam's industrial performance at the macro-level in relation to regional comparators; c) analysis of performance at the sectoral and product levels; and d) policy recommendations.

The first section – "Setting the Scene" – provides an introduction to the challenges countries face in the development process. Special attention is given to the changing context of industrialization and to the identification of the structural drivers of industrial competitiveness. This section also provides a historical perspective of industrial development in Viet Nam, while emphasizing the significance of industrial upgrading and structural change for the country.

The second section – "Competitive Industrial Performance" – places Viet Nam's industrial performance within the context of regional competitors using the CIP index. This section seeks to track Viet Nam's performance at the macro-level. Furthermore, it analyses the vulnerability of Viet Nam's trade to changes in demand or increased competition using the manufactured product diversification index and the diversification market index. Finally, it analyses Viet Nam's ability to adapt production and compete in the world's most dynamic markets.

The third section – "Benchmarking Sectoral Competitiveness" – analyses the performance of Viet Nam across the resource-based, low-tech, medium-tech and high-tech sectors. This analysis includes the identification of key products and groups, and calls attention to specific issues that impede progress or provide opportunities for development in each sector.

The final section provides a list of recommendations for increasing competitiveness in Viet Nam based on the analysis in Sections B and C.

2. Theoretical underpinnings

2.1. The changing context for industrialization

Policymakers must recognize that the context in which industrialization occurs is changing. Viet Nam's industry has clearly benefited from a number of global trends such as increased FDI, the internationalization of value chains and regional dynamism. Despite the country's impressive industrial performance in recent years, Vietnamese policymakers need to acknowledge that rapid and profound technological change, the globalization of production systems in every industry and the emergence of new competitors have created an entirely new context for sustained industrial growth. Some significant features of this new context are:

- *Rapid technological progress affects all economic activities,* rendering older technologies and modes of organization obsolete. This means that every country, regardless of its level of income and development, has to keep abreast of new technologies if it is to remain competitive;
- *International competitiveness has become crucial,* partly because economic distance is shrinking as transport and communication costs fall, and partly because most countries are opening their economies to trade. There is, however, a more important underlying reason for this: tapping the productive potential of new technologies requires countries to more fully participate in global flows of products and inputs – tangible and intangible – and to specialize in ways that maximize the returns to their productive factors;
- *The essence of competitiveness is innovation* and learning, mastering new technologies and complementary advances in business management, organization and networking. This is true in developing countries as well as in highly industrialized ones. As UNIDO's *Industrial Development Report 2002–2003* asserts, developing countries can only tap the existing reservoir of knowledge if they can build the required skills, technological capabilities, entrepreneurship, infrastructure and institutions to master new technologies efficiently. This is not an easy task. It requires more than simply 'opening up' to markets for goods, capital and knowledge. The technological learning process is complex, protracted and demanding, and calls for strategic government intervention;
- *Products and resources* – components, equipment, capital, technology and high-level skills - *move around the globe more easily and rapidly.* The 'death of distance' is the compelling reality within which industrial companies have to grow and compete;
- *The role of transnational companies (TNCs) in world productive activity is increasing,* as they become the main engines of product and factor mobility. TNCs conduct around three quarters of world trade, with some 40 percent of this trade taking place within corporate systems rather than on open markets. Intra-firm trade covers some of the most dynamic, technology intensive activities in the world and entry into these activities necessitates TNC participation;
- One important consequence of the falling costs of distance and liberalization is that *national value chains are more closely linked to global value chains.* Global value chains are now more tightly organized, with a few lead players or "system integrators" acting as focal points for innovation, product development, the securing of raw materials, locating production, transferring information and technologies, organizing the logistics of transportation and handling marketing and promotion. The lead firms in each chain play important roles: they control what is produced, where it is produced, by whom, what quantity, at what price and how (by what processes). Who governs the chain depends on chain type and its stage of technological development. The nature of industrial organization and global value chains is changing as competitive pressures force firms to specialize more narrowly and offload all activities that are not essential to their core competencies.

This means that the determinants of competitive advantage are changing. Resources are being moved across the globe and efficient, reliable and technologically capable producers are being sought. However, these mobile resources need to be complemented by immobile resources in host economies which do not entail basic natural resources or unskilled labour, but technological and organizational skills, good supplier networks and infrastructure, and support services for training, technology and R&D. Countries have to develop these competitive factors to reap the benefits of new technology and global value chains.

Many of these competitive factors develop not only in independent firms, but also in clusters of related firms located in proximity to each other. Many of these new advantages develop faster where firms can share knowledge, skills and innovation, and the promotion of dynamic clusters is now an important tool of competitiveness strategy.

Information and communication technology (ICT) plays a particularly important role in industrial development. The management of global value chains is highly dependent on rapid, efficient and cheap communication. Building the infrastructure and skills required for effective ICT use is crucial if countries are to compete in such chains.

To obtain new technology from leading foreign enterprises conscious strategies to attract and target foreign investment need to be implemented. In fact, sophisticated strategies of investment promotion are a key instrument in competitiveness development.

2.2. Conceptual framework

The concept of industrial competitiveness is defined as *the capacity of countries to increase their industrial presence in domestic and international markets while developing industrial structures in sectors and activities with higher value added and technological content.* Competing through innovation and learning may result in countries obtaining greater and more sustainable industrial revenue (UNIDO, 2002–2003).

It is imperative for policymakers to create a 'checklist' of the key determinants of industrial competitiveness. This is not an easy task. Many social, historical, political and economic factors affect industrial development, and the effects vary over time and by context. Nevertheless, it is useful to list the relevant economic factors that now shape industrial development and to amend the list for specific country conditions and priorities.

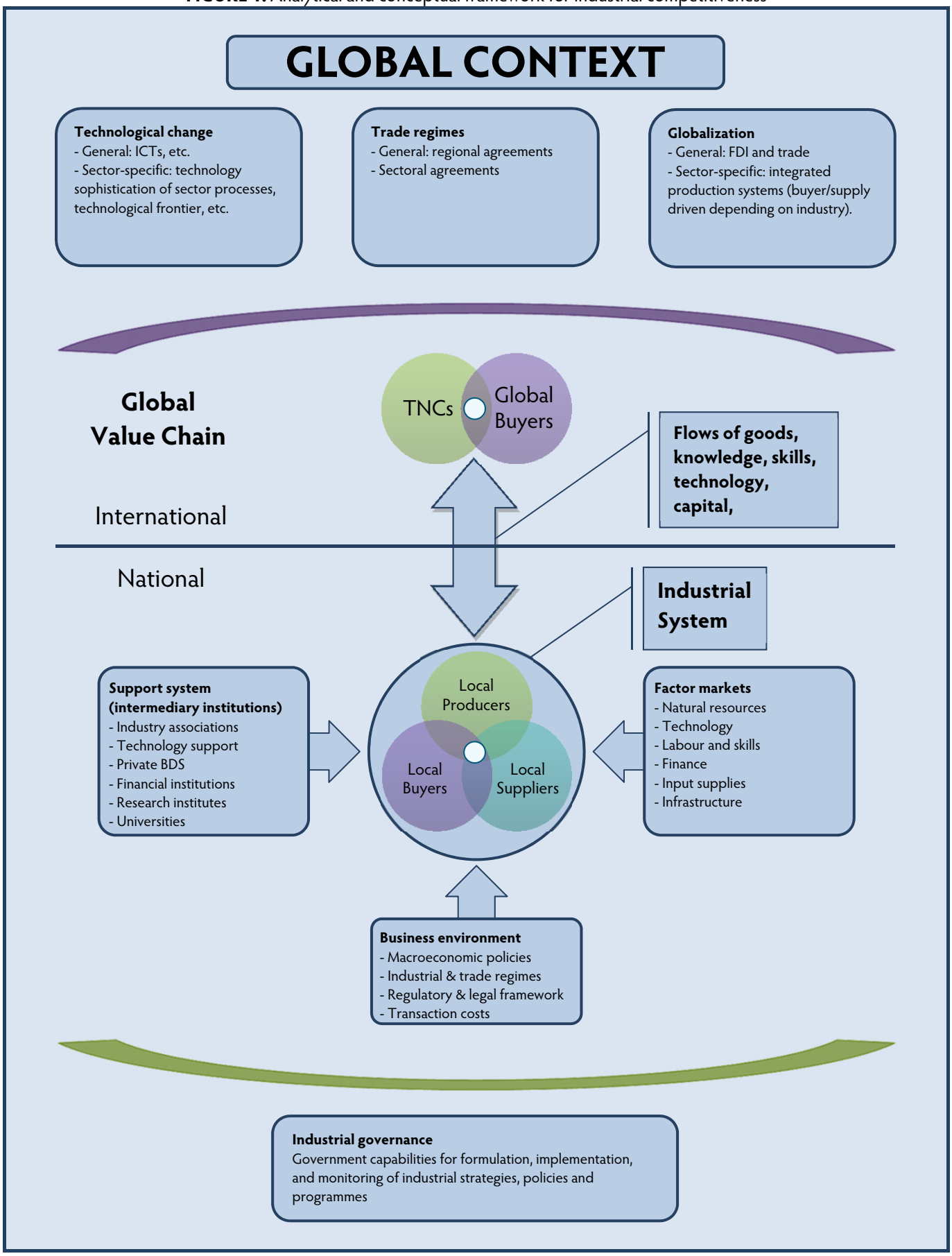
This report draws on UNIDO's framework to identify the 'structural drivers of industrial competitiveness' (see Figure 1).

The industrial system with its main actors (local producers, suppliers, buyers, institutions and policymakers) is at the core of this framework. Industrial systems can be divided into sectors, subsectors and clusters. Actors cooperate and compete with each other, their interactions conditioned by local rules, regulations, customs and social capital. The result is a social and economic *milieu* that affects industrial development as well as the national system of innovation and learning in the country. A strong system produces rapid and widespread learning and broad-based competitiveness. A weak one leads to inefficiency, lags and the inability to compete.

Industrial development fundamentally depends on the international context. As already noted, this context is changing rapidly, driven by globalization, liberalization and technological change. Specifically, it is characterized by tighter linkages within global value chains based on close coordination between national and international actors within integrated systems. The success of national industries thus increasingly depends on firms' ability to build technological competence in given products, processes or functions.

Industrial development depends on the business environment (the 'framework conditions'), the efficiency of factor markets (for labour, skills, technology, finance, inputs and infrastructure) and the quality of support available from intermediary institutions (for training, technological services, R&D, and so on). Government policies can improve or worsen these structural determinants of industrial development; hence, governance (the ability to form, implement and monitor policies) assumes considerable significance.

FIGURE 1. Analytical and conceptual framework for industrial competitiveness



Source: UNIDO.

Many markets in developing countries are inefficient and the necessary institutions are absent. In many cases these deficiencies have arisen as a result of past government policies, and revitalizing industry thus requires the removal of inefficient interventions. In other cases, the government will have to launch new interventions to create or improve markets and institutions that are absent or dysfunctional.

Identifying *where* and *how* the government should intervene (less, more or differently) is the essence of sound industrial policy. This process needs to consider the *global technological context* and the trends in the *value chains* in which national industries operate as well as their *position* in such chains. Furthermore, the learning prospects, technology levels and spillover benefits and costs involved need to be understood. As technological conditions have changed, optimal industrial policies today differ from those which succeeded two or three decades ago. Therefore, it is important to interpret earlier experiences with great care.

2.3. Methodological consideration

Some important methodological considerations need to be outlined:

- *The importance of benchmarking.* A comparison of countries in terms of performance and industrial capacities is intrinsic to this methodology. Benchmarking is necessary because industrial competitiveness is a relative concept; hence, comparisons are essential for determining whether a country is more or less competitive in relation to other countries. The VICR 2011 benchmarks Viet Nam against nine countries in the region based on several criteria: "neighbouring countries", "immediate competitors", "future competitors" and "role models" (in reality, many country comparators meet more than one criterion). The countries are: China and India (giant economies that pose threats to Viet Nam yet also offer interesting opportunities); Cambodia (a neighbouring country with the potential of becoming a future competitor at the lower end of manufacturing); Singapore, Republic of Korea and Taiwan (Province of China) (regional role models in industrialization with a clear focus on technological development); Thailand, Indonesia, the Philippines and Malaysia (immediate competitors as well as role models in various aspects of industrial development);

- *The use of technological classification for manufactured trade and manufacturing value added (MVA).* The VICR 2011 uses UNIDO's technological classification to shed light on the evolution of production and export structures in Viet Nam and its comparators. It distinguishes between resource-based, low-technology, medium-technology and high-technology products both in manufactured exports and MVA.[1] The technology classification, albeit with significant caveats which are discussed later, provides key insights on industrial transformation. A shift of the production and export structure towards 'complex' activities indicates domestic technological deepening and upgrading. The statistical annex provides detailed product classifications;

- *Use of quantitative and transparent data.* The VICR 2011 does not rely on business perceptions to assess Viet Nam's industrial competitiveness. Notwithstanding their usefulness, perception-based surveys generate partial indicators for inter-country comparisons, as the views of individuals and companies are shaped not only by objective circumstances, but by subjective and context sensitive factors as well. UNIDO's methodology relies on a number of carefully selected objective, outcome-based indicators published by international organizations. Although quantitative indicators will never be perfect proxies of what they intend to

1 **Examples of resource-based manufactures** are prepared meats/fruits, beverages, wood products, vegetable oils; and ore concentrates, petroleum/rubber products, cement, cut gems and glass. **Examples of low-tech manufactures** include textile fabrics, clothing, headgear, footwear, leather manufactures, travel goods; as well as pottery, simple metal parts/structures, furniture, jewellery, toys and plastic products. **Examples of medium-tech manufactures** are passenger vehicles and parts, commercial vehicles, motorcycles and parts, synthetic fibres, chemicals and paints, fertilizers, plastics, iron and pipes/tubes; as well as engines, motors, industrial machinery, pumps, switchgear, ships and watches. **Examples of high-tech manufactures** include office/data processing/telecom equipment, TVs, transistors, turbines and power generating equipment; as well as pharmaceuticals, aerospace, optical/measuring instruments and cameras.

measure, they provide a solid foundation for intercountry analyses;

- *Analysis of levels and trends.* The VICR 2011 assesses Viet Nam's industrial performance as well as the overall trends for a specific period. Such an analysis is particularly useful for countries experiencing high levels of growth and which have not yet achieved the rates of development typical of industrialized countries. The analysis covers the period 2000–2009 for all countries, but presents more recent data when available;
- *Macro and sectoral analysis.* Macro analysis provides a general overview of a country's industrial competitiveness vis-à-vis other countries. The prime example of macro analysis in manufacturing is UNIDO's Competitive Industrial Performance (CIP) index. However, composite indices at the macro level are of limited use when designing policies as they normally overlook sectoral dynamics. Many reports lack sectoral analysis, leading to overly generalized policy recommendations. By using UNIDO's methodology, the VICR 2011 combines macro with sectoral analysis, enabling policymakers to establish realistic and applied parameters. The depth of sectoral analysis depends on various factors, including data availability and the objective of the study. The VICR 2011 analyses sectoral performance at the 3-digit level in SITC revision 3.

2.4. Limitations of the report

No methodology is flawless, and the VICR 2011 is no exception. There are several limitations to UNIDO's methodology which the reader should bear in mind:

- *The concept of competitiveness has its detractors.* For example, Krugman (2003) asserts that competitiveness may be a "dangerous obsession" because – according to the theory of comparative advantage – a country cannot be competitive in all sectors. Consequently, attempting to measure competitiveness at the national level is an unsound exercise as it obscures the country's microeconomic (i.e., enterprise level) advantages. Despite this criticism, the VICR 2011 is based on the assumption that the assessment of competitiveness is a useful dimension to the analysis of industrial policy to the extent that it uses meaningful quantitative indicators and takes sectoral dynamics into account. For a competitiveness study to be credible, its scope must be reduced. Competitiveness can be such a broad concept that it is key to be as specific as possible. This report therefore limits the scope of the inquiry to the industrial sector;
- *UNIDO's technology classification is based on several assumptions that do not always accurately reflect the technological content of specific activities.* Sophisticated processes are often a feature of lower-technology sectors, while some activities in high-tech firms do not require advanced skills. For example, computerized-aided design is used in the clothing industry, while the manufacture of semiconductors depends heavily on labour-intensive assembly operations. UNIDO's methodology aggregates sectors and consequently disregards these anomalies. Second, the technology classification fails to discern upgrading within sectors - technology upgrading thus only occurs when a country shifts from one industry to another. This is a major limitation that can only be overcome by sector- and product-specific analysis. It is important to keep these limitations in mind when providing policy recommendations for Viet Nam. This report contends that Viet Nam can benefit considerably from a structural shift towards medium- and high-technology industries, mainly because most newly industrialized countries have experienced a similar shift. However, it is also true that sophistication and industrial deepening take place in less complex industrial sectors. That is, specialization in simple activities within high-tech industries will not bring as many benefits as specialization and value addition in labour-intensive ones.

The analysis presented in this report is illustrative of the industrial development path Viet Nam could follow based on regional role models. This in itself should be of relevance for Vietnamese policymakers. Despite the limitations of UNIDO's methodology and given the lack of better and available quantitative indicators for cross-country analysis, the technology classification used in this report provides interesting insights into industrial transformation. A shift in the structure of MVA towards 'complex' activities may reflect domestic technological deepening and upgrading.

UNIDO's methodology also analyses industrial capabilities or 'drivers of industrial competitiveness'. While the VICR 2011 presents some insights on the state of key industrial drivers, it does not devote a full section to them for two reasons. First, many other reports have already shed light on this aspect. For example, the VCR 2010 includes a full chapter on the foundations of Viet Nam's competitiveness. Second, Viet Nam lacks industry-specific data to assess capabilities. R&D data are not broken down by sector of execution, and data on innovation and human resource formation in manufacturing do not exist. Forthcoming industrial reports would need to rely on an in-depth assessment of Viet Nam's industrial capabilities, though data availability will continue to be a constraint.

3. Industrialization in Viet Nam

3.1. Why it matters

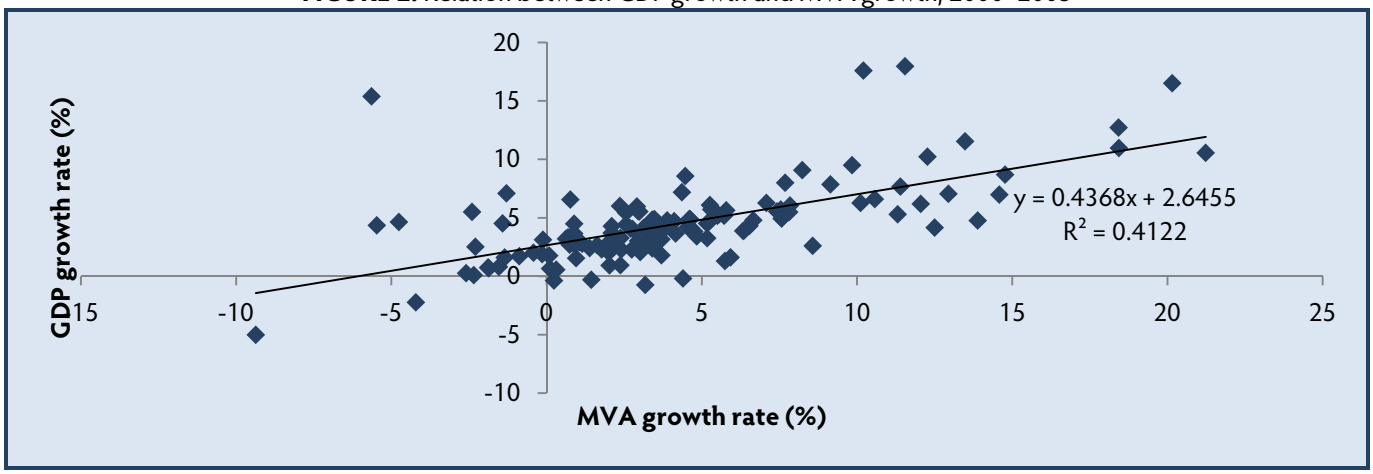
In his most recent book, the internationally acclaimed Cambridge economist Ha-Joon Chang devotes one full section to the importance of manufacturing for economic growth (Chang, 2007). Chang claims:

"History has repeatedly shown that the single most important thing that distinguishes rich countries from poor ones is basically their higher capabilities in manufacturing, where productivity is generally higher, and, most importantly, where productivity tends to (although does not always) grow faster than in agriculture and services" (Chang, 2007:213).

Recent economic developments in East Asia certainly provide a solid argument for boosting manufacturing activities in Viet Nam. Putting these developments aside, a large body of empirical evidence demonstrates that the manufacturing sector must play a key role in Viet Nam's economic development if wealth and jobs are to be created.

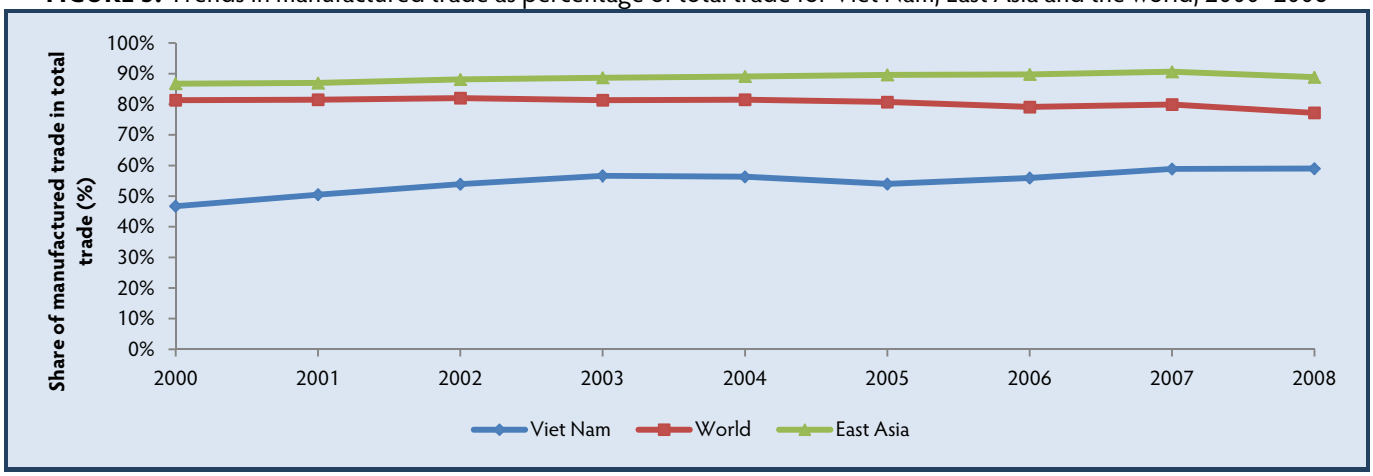
- First, evidence has not only shown that *industrialization is linked to economic growth,* but also that manufacturing can play a catalytic role in transforming the economic structure of agrarian societies. Figure 2, published in UNIDO's Industrial Development Report 2009, illustrates the positive relationship between GDP growth and MVA growth for a sample of 131 countries.
- Secondly, *manufacturing accounts* for the bulk of world exports (80 percent in 2008), *and is less exposed to external shocks, price fluctuations, climatic conditions and unfair competition policies.* The price of manufactured goods tends to be more stable than that of commodities. Unfair competition policies have distorted prices around the world, limiting the potential for export growth in some commodities;
- Third, *manufacturing generates externalities in technology development, skill creation and learning that are crucial for competitiveness.* For instance, manufacturing is the main vehicle for technology development and innovation, representing the hub of technological progress. Industry uses technology in many forms and at different levels to increase returns to investment by shifting from low to high productivity activities. Manufacturing also offers great potential for informal innovation activities such as ad hoc incremental improvements in products and processes;
- Fourth, *manufacturing has a 'pull effect' on other sectors of the economy.* The development of the manufacturing sector stimulates demand for more and better services: banking, insurance, communication and transport;

FIGURE 2. Relation between GDP growth and MVA growth, 2000–2005



Source: World Development Indicators.

FIGURE 3. Trends in manufactured trade as percentage of total trade for Viet Nam, East Asia and the world, 2000–2008



Source: UN Comtrade.

- Finally, the *internationalization of production has spread the benefits of manufacturing.* The geographical distribution of the activities of multinational corporations (MNCs) has benefited manufacturing in the developing world more than other sectors of the economy. The trend towards the vertical disintegration of production activities in industrialized countries means that developing countries have higher chances of integrating into global value chains.

The message is clear: Viet Nam has to rely on manufacturing as the main engine of growth. However, most importantly, if Viet Nam is to speed up the industrialization process to sustain growth, it needs to specialize in fast-growing, high value added activities.

Viet Nam has recognized the significance of manufacturing for its economic growth and is quickly industrializing. The contribution of MVA to GDP in Viet Nam has increased from 18.6 percent in 2000 to 26.1 percent in 2009.[2] Nonetheless, this figure still lies far below the best performing East Asian dragons. The MVA share of industry in GDP in Thailand and China was above 35 percent in 2009. Moreover, the analysis in the following sections reveals that the industrial gap between Viet Nam and these two countries is greater than this indicator might suggest.

Manufacturing progress in Viet Nam is also reflected in changing patterns of trade. Trade in manufactures as a share of total trade has increased from 46.7 percent in 2000 to 63.8 percent in 2008 (see Figure 3). However, there is still a 26 percentage point difference between Viet Nam and the manufactured export orientation of average East Asia.

Although still far from reaching regional averages, Viet Nam's figures show that manufacturing is increasingly becoming an engine of growth in the economy. This report argues that structural change takes place at two levels: from other sectors towards manufacturing and within manufacturing. While Viet Nam is clearly making progress on the former, the subsequent sections of the report reveal that Viet Nam lacks technology intensive and knowledge driven manufacturing activities to sustain growth in the long run.

The notion that manufacturing can foster strong growth in Viet Nam as well as employment for the country's expanding workforce is central to this report. However, to ensure both continued growth in manufactured exports and employment generation, Viet Nam must promote manufacturing in more technology intensive subsectors.

3.2. Industrial policy in Viet Nam: A historical perspective

In the decades since the initiation of the Doi Moi reforms in 1986, Viet Nam has undergone a dramatic restructuring from a centrally planned to a market based socialist economy, transforming the lives of its citizens. Industrial policy has played a central role in the country's economic transformation, though the focus has changed over time:

- In the period between 1946 and 1954, the main focus was on the promotion of agricultural production, cottage industries,

2 UNIDO estimate.

mining, mechanical, metallurgical, textile, paper and pharmaceuticals industries;

- Between 1955 and 1965, the emphasis after the war was on rebuilding and developing the industrial sector through the transfer of industrial property to private-state joint ventures and cooperative enterprises. The focus was on selected heavy industries (mechanical engineering, extractive metallurgy, chemicals, fertilizer) and light industries (consumption goods and equipment for agricultural development);
- Between 1965 and 1975, Viet Nam underwent a period of protectionism with a focus on a number of basic industries such as manufacture of construction materials, energy, machines and parts, shipbuilding, automobile/motorcycle repair, service for transportation and consumer goods;
- In the period 1975–1985, Viet Nam continued to implement industrial policy to create a new economic structure based on agriculture rehabilitation and the development of industrial production. The main objective was to meet demand for equipment and consumer goods and to make improvements in the industrial sector of the South;
- The industrial reconstruction period lasted 20 years, from 1986 to 2006. During this period, industrial policy focused on the following priorities:
  a) The renewal of socialist industrialization and the adjustment of industrial structure policies to promote industrialization and modernization with a focus on agricultural production, consumer goods for export markets (for example, textiles, footwear, seafood) and some heavy industries for which Viet Nam had a competitive edge (energy, fuel, construction materials, processing industry, shipbuilding and ship repair industry, metallurgy and chemicals);
  b) Development of state industrial enterprises, gradually expanding the autonomy of state enterprises along with the removal of state subsidies;
  c) Development of the private sector, opening to FDI and international economic integration.
- Two major policy changes initiated in the period between 2000 and 2010 led to a significant modification of Viet Nam's industrial structure. One was Viet Nam's decision to become a WTO member and to thus negotiate trade agreements with important trade partners, notably the US, EU and Japan. Consequently, Viet Nam had to revise several laws and regulations linked with WTO accession.[3] The second major change was the decision by the government and the National Assembly to approve the Enterprise Laws of 2000 and 2005 to create a level playing field for all enterprises, regardless of ownership status;
- For the years ahead (2011–2020), the Government of Viet Nam has a clear view of the overall goals of the country's industrial policy:
  a) Sustaining the growth levels of the industrial sector, implementing restructuring to cope with the process of international economic integration;
  b) Focusing on the development of competitive advantage and labour-intensive industries such as agro-industry, food, machinery, mechanical engineering and construction materials;
  c) Further developing key industries such as energy, chemicals, metallurgy and mechanical engineering;
  d) Promoting supporting industries to improve the quality of industrialization and to foster technological development.

3 In a report from 2009, Dwight Perkins and Vu Thanh Tu Anh show that it is difficult to exaggerate the significance of these trade agreements for Viet Nam's industrial policy. Industries in the state sector which had enjoyed development behind high protective barriers were facing the near to complete removal of those barriers. In effect, the state owned sector was being told by those negotiating the WTO agreement with Viet Nam that it had to become internationally competitive and that it had to do so without delay.

A review carried out for the purpose of this report identified 44 industrial sector master plans and seven specific strategies for sector development.[4] According to a recent study, Viet Nam has, since 1995, elaborated around 80 development strategies, master plans and plans for individual industries (Kim & Nguyen, 2011). Viet Nam hence does not lack policies for industrial development, but rather lacks an effective implementation plan to incorporate a harmonized approach that takes account of various sectoral needs. Current policy outlines the planned goals of given sectors based on specified support measures, which are normally not fully implemented due to a lack of resources.

In addition to the large number of master plans, the Vietnamese government has focused on the development, improvement in efficiency and reorganization of its core industrial sector driven by state owned enterprises. A Prime Ministerial decision in 2005 saw the establishment of eight Economic Groups, each with a strategic responsibility for specific sectors. The eight Economic Groups are Viet Nam Posts and Telecommunications Corporation (post and telecommunication), Viet Nam National Coal and Mineral Corporation (mining), Viet Nam National Textile and Garments Corporation (textiles and garments), Viet Nam Electricity Corporation (electricity), Viet Nam National Shipbuilding Corporation (shipbuilding and ports), Viet Nam Petroleum and Gas Corporation (oil and gas exploration), Viet Nam Rubber Corporation (rubber) and Bao Viet Insurance and Finance Group (insurance and finance).[5]

4 This represents an initial overview from the Minister of Industry and Trade and may not include master plans of other ministries.

5 Prior to the reorganization of Vinashin and detection of the corporation's debt of over US$ 4.5 billion, the government was considering the expansion of the Economic Group model to include Song Da Construction Corporation, Lilama Corporation and Hanoi Urban Development Corporation to pilot an Economic Group.

VIET NAM INDUSTRIAL COMPETITIVENESS REPORT 2011

Section B:

COMPETITIVE INDUSTRIAL PERFORMANCE

4. Benchmarking Viet Nam's industrial performance

Benchmarking generates valuable information for policy. Growing concern about global competition has resulted in a cottage industry of international indices and country rankings produced by international organizations and other bodies. In the field of industry, UNIDO has developed its own index to benchmark industrial competitiveness at the global level.

International industrial benchmarks are needed because it is difficult to assess national performance on the basis of domestic indicators alone. Economic theory does not provide a straightforward approach to assess the many dimensions of industrial performance. The best approach is thus to compare the situation in a given country to comparators using quantitative indicators that are transparent and technically sound. The fact that national industrial performance is now affected by a growing number of exogenous factors (international technological change, globalization, regional integration) makes international comparisons even more relevant when defining national industrial targets and strategies.

Benchmarking can be conducted at many levels – the more specific the level, the easier it is to derive useful quantitative indicators. This makes benchmarking industrial performance easier than benchmarking national competitiveness. The downside is that disaggregation makes it more difficult to find data for cross-country comparisons. International industrial benchmarking, while still quite broad, provides useful preliminary indicators of relative performance. Benchmarking helps policymakers assess progress, learn lessons from role models and identify strategic paths for industrial growth. To further support policymaking, this generalized assessment would need to be supplemented by in-depth analysis at the sector and activity levels, as well as by qualitative institutional and policy variables that quantitative benchmarks omit.

This section analyses Viet Nam's industrial performance and compares it to that of ten countries: Cambodia, China, India, Indonesia, Malaysia, Taiwan (Province of China), Thailand, the Philippines, Singapore and Republic of Korea. All of these countries fall under one or several of the following four basic criteria for the identification of suitable country benchmarks:

- *Neighbouring countries* that share the same geographical advantages and have similar production structures;
- *Immediate competitors* that, given similar factor endowments, specialize in the same industrial sectors;
- *Future competitors* that are likely to pose a competitive threat in sectors of comparative and competitive advantage;
- *Role models* that suggest obtainable goals for industrial development.

This section positions Viet Nam in UNIDO's Competitive Industrial Performance (CIP) index, which combines several dimensions of industrial performance into a single measure. Second, it assesses Viet Nam's MVA and manufactured trade performance. Third, it sheds light on Viet Nam's ability to move up the technology ladder and to increase value added by shifting towards technology intensive sectors. Finally, it analyses Viet Nam's product and market diversification pattern and ranks it, together with the other country comparators, in a vulnerability matrix.

4.1. Viet Nam in UNIDO's Competitive Industrial Performance (CIP) index

UNIDO's Competitive Industrial Performance (CIP) index combines several dimensions of industrial performance into a single intuitive measure. It captures the ability of countries to produce and export manufactures competitively, as well as the structural change towards high value added, technology intensive sectors. UNIDO publishes the CIP index in its flagship report, the *Industrial Development Report,* benchmarking 118 countries. Box 1 presents the dimensions, indicators and calculation of the CIP index.

Table 1 presents the country rankings in the CIP index published in UNIDO's Industrial Development Report 2011.

BOX 1. Dimensions, indicators and calculation of the CIP index

The CIP index groups eight indicators in six dimensions of industrial performance:

- *Industrial capacity. MVA per capita* is the basic indicator of a country's level of industrialization adjusted for population size. It shows a country's capacity to add value in the manufacturing process. Yet MVA is not always exposed to international competition – inward-oriented policies and trade barriers can limit the exposure of domestic industries to global competition. MVA analysis may show distorting results for countries that have undergone a long period of protectionism and import substitution. It is therefore important to combine MVA with export orientation, which places the competitiveness of industrial activity in the international scene.
- *Manufactured export capacity.* In a globalizing world, the capacity to export is a key ingredient for economic growth and competitiveness. *Manufactured export per capita* is the basic indicator of trade competitiveness: it shows the capacity of countries to meet global demand for manufactured goods in a highly competitive and changing environment. Manufactured exports indicate whether national MVA is in fact competitive internationally. MVA also adds to trade analysis as it shows the extent of value that domestic companies contribute to exports. Trade analysis on its own can cause distortions in the case of countries with low domestic capabilities, but is used by multinational corporations (MNCs) as export platforms.
- *Impact in world MVA.* The impact of a country in world MVA production is measured by its *share in world MVA*, which indicates the relative performance and impact of a country, taking into account total volumes of manufacturing production. It indicates the position of a country relative to others in terms of its contribution to world MVA.
- *Impact in world manufactured trade.* The impact of a country in world manufactured exports is measured by its *share in world manufactured exports.* It reveals the competitive position of a country relative to others in international markets. Gains in world market shares reflect improved competitiveness, while losses signal a deterioration of a country's competitive position.
- *Industrialization intensity.* The intensity of industrialization is measured by the arithmetic average of the *share of MVA in GDP* and the *share of medium- and high-technology activities (MHT) in MVA.* The former captures the role of manufacturing in the economy and the latter the technological complexity of manufacturing. The latter variable also adds positive weight to complex activities on the grounds that these are desirable for competitive performance: a more complex structure denotes industrial maturity, flexibility and the ability to move into faster growing activities. However, the measure only captures shifts across activities and not the upgrading within them, and it overlooks an important aspect of technological improvement. It is also fairly aggregate and cannot capture fine technological differences within the categories (some low-technology activities may have segments of high-technology, and vice versa). These deficiencies reflect the nature of the data, but the broad findings appear to be sound and plausible.
- *Export quality.* The quality of exports is measured by the simple formula of the *share of manufactured exports in total exports* and the *share of medium- and high-technology products in manufactured exports.* The reasoning is similar to that of industrialization intensity. The share of manufactures in total exports captures the role of manufacturing in export activity. The share of medium- and high-technology products captures the technological complexity of exports, along with the ability to manufacture more advanced products and move into more dynamic areas of exports.

All indicators are standardized according to the following formula:

$$I_{ij} = \frac{X_{ij} - Min(X_{ij})}{Max(X_{ij}) - Min(X_{ij})}$$

Where *Xij* is the index value *i* of country *j*, *Min* is the smallest value in the sample and *Max* the largest. The top country in the sample has the value 1 while the worst performing country has the value 0. The combined index is calculated as the arithmetic mean of the standardized values of the indicators. All six dimensions of the CIP index are given equal weight. In the last two dimensions (industrialization intensity and export quality), each indicator has equal weight, which results in half the weight given to the other indicators in the overall aggregation model.

Source: UNIDO.

The general stability of the ranking positions over time demonstrates that economic transformation and structural change is a path-dependent process that takes time (55 percent of countries have experienced no change or slight change, moving three positions or less). Leaps are nevertheless possible and reflect responses to major improvements or deterioration in the basic conditions of industrial activity which occurred between 2005 and 2009.

TABLE 1. Ranking of countries in the CIP index, 2005–2009

Ranking		Country or territory	CIP index	
2005	2009		2005	2009
3	1	Singapore	0.631	0.642
2	2	United States of America	0.660	0.634
1	3	Japan	0.661	0.628
4	4	Germany	0.598	0.597
6	5	China	0.461	0.557
7	6	Switzerland	0.455	0.513
9	7	Republic of Korea	0.438	0.480
5	8	Ireland	0.499	0.479
11	9	Finland	0.411	0.442
8	10	Belgium	0.439	0.442
12	11	Taiwan (Province of China)	0.401	0.437
10	12	Sweden	0.432	0.430
18	13	Austria	0.368	0.401
21	14	Slovakia	0.322	0.387
13	15	France	0.395	0.384
16	16	Netherlands	0.374	0.378
14	17	Hong Kong (SAR of China)	0.385	0.375
17	18	Italy	0.370	0.361
15	19	United Kingdom	0.383	0.356
24	20	Czech Republic	0.310	0.352
26	21	Slovenia	0.306	0.345
30	22	Israel	0.286	0.332
25	23	Hungary	0.310	0.328
22	24	Luxembourg	0.316	0.323
27	25	Thailand	0.300	0.320
23	26	Denmark	0.311	0.320
20	27	Malaysia	0.330	0.320
19	28	Canada	0.349	0.309
28	29	Spain	0.293	0.291
29	30	Mexico	0.286	0.286
31	31	Malta	0.266	0.284
34	32	Poland	0.235	0.279
32	33	Philippines	0.262	0.272
38	34	Norway	0.209	0.248
33	35	Turkey	0.237	0.237
35	36	Estonia	0.220	0.234
36	37	Portugal	0.218	0.224
43	38	Iceland	0.187	0.218
47	39	Romania	0.178	0.218
41	40	Lithuania	0.196	0.216
39	41	Costa Rica	0.208	0.215
42	42	India	0.190	0.206
40	43	Indonesia	0.198	0.203
37	44	Brazil	0.212	0.202
51	45	Jordan	0.167	0.193
49	46	Argentina	0.168	0.192
46	47	Australia	0.180	0.188
62	48	Swaziland	0.152	0.186
45	49	South Africa	0.181	0.184
52	50	Greece	0.166	0.182
58	51	Georgia	0.155	0.179
61	52	Latvia	0.154	0.178
44	53	Cyprus	0.182	0.176
53	54	Bulgaria	0.165	0.176
54	55	Tunisia	0.157	0.175
50	56	El Salvador	0.168	0.175
55	57	Barbados	0.156	0.174
72	58	Viet Nam	0.137	0.171
59	59	Morocco	0.155	0.168
64	60	Qatar	0.150	0.168
48	61	New Zealand	0.172	0.161
73	62	Egypt	0.137	0.157
67	63	Pakistan	0.147	0.156
88	64	Kuwait	0.107	0.156
60	65	Bahamas	0.154	0.154
57	66	Russian Federation	0.155	0.154
63	67	Trinidad and Tobago	0.151	0.151
66	68	F. Yugoslav Republic of Macedonia	0.147	0.149
75	69	Bangladesh	0.135	0.145
56	70	Mauritius	0.156	0.144
65	71	Lebanon	0.149	0.144
78	72	Macau (SAR of China)	0.130	0.142
76	73	Jamaica	0.132	0.141
69	74	Colombia	0.140	0.135
68	75	Senegal	0.142	0.134
77	76	Albania	0.132	0.133
71	77	Bolivarian Republic of Venezuela	0.138	0.131
79	78	Botswana	0.128	0.131
80	79	Uruguay	0.123	0.129
102	80	Syrian Arab Republic	0.082	0.128
70	81	Chile	0.139	0.128
89	82	Saint Lucia	0.106	0.127
82	83	Islamic Republic of Iran	0.114	0.126
87	84	Republic of Moldova	0.111	0.126
98	85	Gambia	0.087	0.124
83	86	Palestinian Territories	0.114	0.121
90	87	Rwanda	0.106	0.119
93	88	Cambodia	0.102	0.119
92	89	Honduras	0.103	0.118
74	90	Côte d'Ivoire	0.136	0.116
99	91	Oman	0.087	0.115
86	92	Sri Lanka	0.111	0.115
94	93	Fiji	0.101	0.110
91	94	Nepal	0.105	0.108
85	95	Niger	0.111	0.107
96	96	Peru	0.094	0.106
100	97	Madagascar	0.086	0.101
105	98	Uganda	0.075	0.100
84	99	Zimbabwe	0.114	0.100
97	100	Kenya	0.092	0.094
101	101	Kyrgyzstan	0.085	0.089
103	102	Cameroon	0.080	0.083
81	103	Nigeria	0.114	0.081
108	104	Ecuador	0.069	0.079
104	105	Paraguay	0.075	0.076
107	106	Eritrea	0.071	0.076
111	107	Plurinational State of Bolivia	0.063	0.073
112	108	Mongolia	0.055	0.070
109	109	Ghana	0.069	0.069
114	110	United Republic of Tanzania	0.046	0.068
118	111	Ethiopia	0.017	0.068
110	112	Malawi	0.064	0.059
113	113	Panama	0.048	0.053
116	114	Yemen	0.036	0.044
115	115	Algeria	0.037	0.042
117	116	Gabon	0.034	0.038
106	117	Azerbaijan	0.072	0.036
95	118	Sudan	0.095	0.035

Source: UNIDO, 2011 (forthcoming).

East Asia continues to have a strong impact on global industrial competitiveness. Singapore has become the world's most competitive country in industry, overtaking Japan and the US, and China has moved ahead of Switzerland and is quickly closing the gap with Germany. Malaysia, Indonesia and the Philippines are the only countries in the report's sample that have experienced a slight deterioration in the CIP ranking. This can partly be explained by their strong dependence on the primary sector and the effect of the commodity price bonanza in recent years.

Viet Nam's performance in the CIP ranking deserves special attention. Viet Nam ranked 58th in 2009, jumping 14 spots within only four years, thus becoming one of the most rapidly improving countries in the world. Within four years, Viet Nam has overtaken strong competitors with a long industrialization tradition such as Egypt, Morocco and Russia. This is a clear indication that Viet Nam is turning into a rising star on the global manufacturing scene and a threat to competitors around the world.

Viet Nam's impressive performance has attracted attention in the region. Neighbouring countries like China are concerned about Viet Nam's potential capacity to attract foreign investors that want to relocate. However, as this report shows, Viet Nam still needs a clear strategy to target quality investment for high value added manufacturing. Despite obvious improvements, investors still largely view Viet Nam as a location for cheap export-oriented manufacturing and not as a hub for high value added manufacturing. Consequently, Viet Nam continues to remain well behind its regional role models. It lags behind Indonesia by 15 and the Philippines by 25 points. Thus, in the broader regional context, Viet Nam still has some way to go before it catches up with the regional leaders in East Asia.

In terms of industrial policy, Viet Nam is at a crossroads. The country can continue to specialize in export-oriented, labour-intensive manufacturing or it can fundamentally shift towards higher value added manufacturing. This report argues that, as competition mounts, maintaining the industrial status quo will not help Viet Nam move up the competitiveness ladder. Technological deepening and structural change is the best option if Viet Nam is to sustain its growth and improve its CIP ranking over the next few years.

But what dimensions of industrial competitiveness does Viet Nam need to strengthen in order to catch up with the 'more industrialized' East Asian countries? The following sections explore the individual dimensions of competitiveness to provide some answers to this question.

4.2. Manufacturing value added (MVA) performance

MVA is the basic indicator of industrial performance. It denotes the sector's depth and the existence of industry-specific capabilities at the firm level.

Viet Nam's MVA growth has been impressive. Between 2000 and 2009, MVA skyrocketed from US$ 5.8 billion to US$ 15.4 billion (see Table 2). What is even more remarkable is the consistency of this growth trajectory. Viet Nam achieved double-digit growth rates in the first and second half of the decade, a feat that was only achieved by China and Cambodia within the region. MVA growth has gone hand in hand with economic growth. China, Cambodia and Viet Nam recorded the highest GDP growth rates for the period (10 percent, 8 percent and 7.3 percent, respectively), implying that there is a strong link between industrialization and economic development.

The question is whether Viet Nam can keep up such impressive growth rates as the absolute value of MVA increases, especially if the country maintains its manufacturing focus on labour-intensive goods. As countries expand their industrial base, they are likely to experience less consistent growth rates. Industrial expansion calls for structural change towards more sophisticated industries and not just a shift from agriculture to manufacturing as has been the case in both Cambodia and Viet Nam over the last decades.

TABLE 2. Manufacturing value added for Viet Nam and comparators, 2000–2009

Country	MVA (US$ billion constant 2000 prices)			Average annual growth rate		
	2000	2005	2009	2000–2005	2005–2009	2000–2009
Cambodia	0.6	1.1	1.7	14%	10%	12%
China	384.9	645.8	1,013.6	11%	12%	11%
Taiwan (Province of China)	76.3	95.1	117.5	5%	5%	5%
India	65.8	91.0	118.8	7%	7%	7%
Indonesia	45.8	58.4	70.0	5%	5%	5%
Malaysia	29.4	36.2	38.2	4%	1%	3%
Philippines	16.9	20.9	23.6	4%	3%	4%
Republic of Korea	133.7	184.5	221.4	7%	5%	6%
Thailand	41.2	56.4	65.0	7%	4%	5%
Viet Nam	5.8	10.0	15.4	12%	11%	12%

Source: World Development Indicators.

TABLE 3. Manufacturing value added per capita for Viet Nam and comparators, 2000–2009

Country	Value (US$ constant 2000 prices per ps)		
	2000	2005	2009
Taiwan (Province of China)	3,435	4,192	5,101
Republic of Korea	2,859	3,854	4,562
Malaysia	1,265	1,412	1,390
Thailand	680	895	1,004
China	303	492	754
Indonesia	216	258	295
Philippines	221	247	258
Viet Nam	73	118	171
Cambodia	46	80	111
India	63	80	99

Source: World Development Indicators.

MVA performance can be put into perspective if it is adjusted by country size. MVA per capita in Viet Nam rose considerably from US$ 73 in 2000 to US$ 171 in 2009 – an impressive increase by US$ 98 in nine years (see Table 3). Despite this rise, Viet Nam lags behind most countries in the region. Viet Nam's per capita MVA level in 2009 was still US$ 50 per capita short of the Philippines' in 2000. If we extrapolate trends in the Philippines and Indonesia over time and assume that Viet Nam's MVA per capita continues to grow at the same pace, it would take around 30 and 70 years, respectively, for Viet Nam to catch up with these countries. This means that MVA growth in Viet Nam is actually not as impressive as it appears at first glance. However, Viet Nam's industrial sector has the capacity to grow even faster given the size of its labour force employable in productive industry.

4.3. Manufactured export performance

Trade liberalization and the integration of national economies have been the defining characteristics of the global economy over the last few decades. Manufactured trade has grown faster than MVA in the last years, which is a result of the fragmentation and internationalization of industrial activity. Trade growth has been driven by efforts to deepen economic integration, improve physical and communications infrastructure and global demand. China and India have been the driving force behind the booming demand for primary goods in recent years.

MVA analysis on its own does not always show how internationally competitive a domestic industry is. Take, for instance, the case of a highly protected economy. Inward-looking policies may distort the real competitive performance of a country as industries are not exposed to international competition and imports are restricted. It is therefore necessary to complement MVA analysis with some indicators of international competitiveness. Manufactured export performance is commonly used to assess industrial competitiveness in global markets.

Manufactured export growth in Viet Nam over the last decades has been impressive, even outshining China's growth for the period 2000–2009. Viet

Nam's manufactured trade soared from US$ 6.7 billion in 2000 to more than US$ 36 billion in 2009 (see Table 4). The most impressive fact is that Viet Nam's manufactured export growth seems to have been unaffected by the financial crisis of the last years. Other countries like China, India, Republic of Korea and Taiwan (Province of China) saw a major slowdown in manufactured trade with the US and EU markets. Viet Nam's gains illustrate the country's rapid integration into the world economy, including the crucial Bilateral Trade Agreement with the US in 2000 and WTO accession in 2007.

Despite the booming trade in manufactures, Viet Nam's manufactured exports as a share of total exports remained among the lowest in the region in 2009. When looking at Figure 4, one could argue that in order to join the regional club of highly industrialized economies, Viet Nam's manufactured trade ought to account for more than 80 percent of its total trade. In the case of Republic of Korea, China and Taiwan (Province of China), the obvious role models in the region, manufactured exports represent more than 90 percent of their total trade.

Adjusted for population size, Viet Nam's manufactured export performance remains striking. Within only nine years, Viet Nam's manufactured exports per capita soared from US$ 87 in 2000 to US$ 417 in 2009 (see Table 5). In the regional ranking, Viet Nam surpassed the Philippines and Indonesia in 2009, but the gap with China is still substantial.

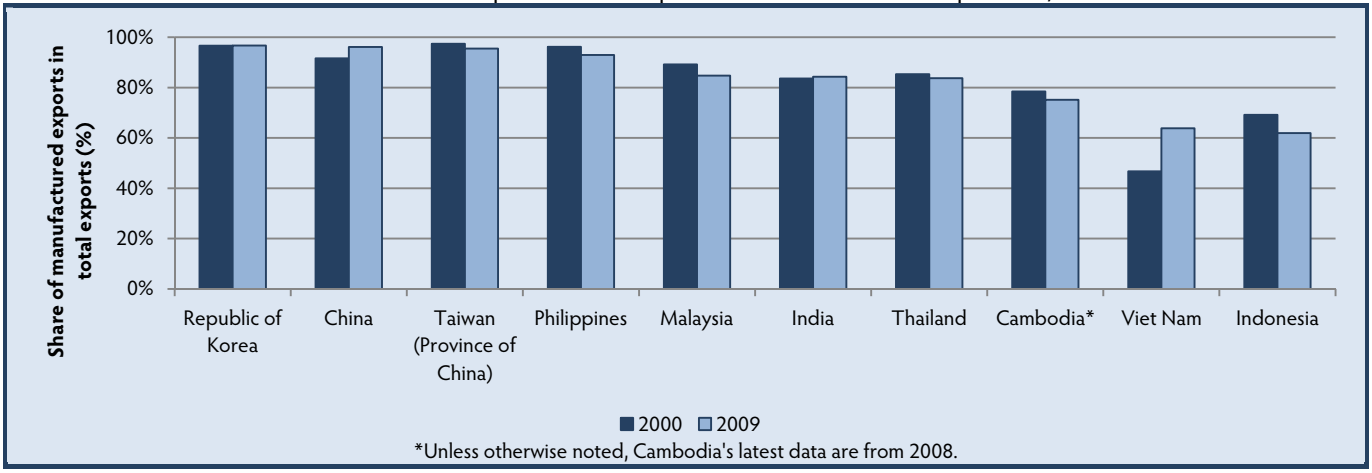
Viet Nam's successful trade performance in the last ten years has been highly praised nationally and internationally. A consensus has emerged that trade liberalization is the main factor in stimulating the growth of exports. However, some argue that export growth should be interpreted with caution as Viet Nam's trade pattern is heavily reliant on imports and the domestic technological content is limited. Let us look at these two issues in more detail.

TABLE 4. Manufactured exports for Viet Nam and comparators, 2000–2009

Country	Manufactured exports (US$ million)			Average annual growth rate		
	2000	2005	2009	2000–2005	2005–2009	2000–2009
China	228,407	722,628	1,155,517	26%	12%	20%
Republic of Korea	166,543	277,717	351,697	11%	6%	9%
Taiwan (Province of China)	144,466	183,094	184,896	5%	0%	3%
India	35,419	87,168	149,047	20%	14%	17%
Malaysia	87,643	120,622	133,222	7%	3%	5%
Thailand	58,731	95,859	127,686	10%	7%	9%
Indonesia	42,990	55,118	72,130	5%	7%	6%
Viet Nam	6,765	17,504	36,429	21%	20%	21%
Philippines	36,633	39,432	35,729	1%	-2%	0%
Cambodia	1,090	2,093	3,276	14%	16%	15%

Source: UN Comtrade.

FIGURE 4. Manufactured exports in total exports for Viet Nam and comparators, 2000–2009



Source: UN Comtrade.

TABLE 5. Manufactured exports per capita for Viet Nam and comparators, 2000–2009

Ranking		Country	Value (US$ per ps)	
2009	2000		2009	2000
1	1	Taiwan (Province of China)	8,017	6,485
2	3	Republic of Korea	7,215	3,543
3	2	Malaysia	4,850	3,766
4	4	Thailand	1,884	942
5	7	China	868	181
6	8	Viet Nam	417	87
7	5	Philippines	388	472
8	6	Indonesia	314	209
9	9	Cambodia	225	85
10	10	India	129	35

Source: UN Comtrade, World Development Indicators.

How much domestic industry has contributed to the export boom is one of the most important questions for Viet Nam's industrial entrepreneurs. There is no straightforward answer to this question. The MVA analysis in this report suggests that Viet Nam's manufactured trade performance has outshined its MVA performance by a large margin. In other words, the competitiveness achieved by Viet Nam in export markets does not correspond to the performance of its national industry. For every unit of MVA produced in Viet Nam, 2.5 times this value is exported, which not only reflects Viet Nam's export propensity, but a mismatch between production capacity and export performance as well.

BOX 2. Viet Nam's trade deficit with China

China is the largest neighbouring market of Viet Nam. Historically, the countries have had a trade relationship and have signed a number of international trade agreements: a Bilateral Trade Agreement, Free Trade Agreement between ASEAN–China (ACFTA) and the World Trade Organization.

Total exports from Viet Nam to China increased rapidly from US$ 1.5 billion in 2000 to US$ 5 billion in 2009, an average growth rate of 14 percent per year. For the same period, total imports from China soared from US$ 1.5 billion in 2000 to US$ 15.6 billion in 2009, a growth rate of 30 percent per year. The result is that Viet Nam's trade balance with China has gone from a small surplus of US$ 14 million in 2000 to a deficit of US$ 10.6 billion in 2009.

In Decision 23/2007/QD-BTM of the Ministry of Trade dated 2 August 2007, the export target for China for 2010 was US$ 5.4 billion, which was easily met. The target for 2015 is to double that figure. This decision does not address the issue of Viet Nam's huge trade deficit with China. It is worth noting that in 2009, Vietnamese exports to China accounted for 9 percent of its total exports, but imports from China accounted for 24 percent of total imports to Viet Nam.

The main reason for Viet Nam's trade deficit with China is the unbalanced trade pattern between the two countries. Viet Nam exports low value added goods, and imports not only volume from China, but technology intensive manufactures. Close proximity, technological progress and undervaluation of the RMB by the Chinese government have made Chinese enterprises and commodities very attractive in Viet Nam. Due to the economic integration and foreign investment attraction, the Vietnamese market is now more open to foreign investors through Engineering Procurement and Construction (EPC) contracts which are widely used for international bidding in Viet Nam. Based on EPC contracts, Chinese bidders are often successful as they can package design, machinery and equipment procurement together with construction. Domestic firms can only operate and use the resulting facilities. A number of large Chinese EPC contracts have been awarded in electricity, transportation and construction, for example, the Hai Phong thermo power plant, the Quang Ninh thermo power plant, the Kinh Luong thermo power plant, the Kien Luong power plant, the Long Thanh – Dau Giay road of the North-South highway, the Hanoi internal railway, the Nghi Son cement plant and the Tay Nguyen bauxite project. Moreover, FDI in Viet Nam has often been linked to foreign firms relocating final assembly to Viet Nam in order to take advantage of low labour costs and the country's preferential market access. These firms relocate if tariff conditions change, especially for Viet Nam's major exports like garments and textiles, footwear, computers and electronics. Due to the underdevelopment of supporting industries, Vietnamese enterprises import production materials from China and then only contribute assembly labour before exporting to the EU or US.

Source: Nguyen, 2011.

Import figures tell a less optimistic story about the effects of trade liberalization. Between 2000 and 2009, Viet Nam's manufactured imports grew by 19 percent per annum, almost matching manufactured export growth for the same period. Viet Nam's trade deficit in manufactured goods was US$ 25 billion in 2009, with China accounting for nearly 50 percent of the total (see Box 2).

Trade liberalization has also failed to trigger change in Viet Nam's manufactured export pattern. Viet Nam has a positive trade balance in low-technology manufactures (around US$ 10 billion in 2009), while recording a trade deficit at the more sophisticated end of the manufacturing spectrum. Viet Nam's deficit in medium- and high-technology trade peaked at US$ 20 billion and US$ 5 billion in 2009, respectively. The VCR 2010 states that higher living standards and demand for luxury goods are putting additional pressure on Viet Nam's trade balance and foreign exchange reserves. While this is true, it is unlikely that this trend will be reversed, as the country has just reached middle income status. Boosting the domestic industrial sector and the technological content of exported goods may well be the best option to bridge the trade gap. In particular, attention needs to be paid to the opportunities the Chinese market offers Vietnamese exporters.

4.4. Structural change

Under standard trade theory, structures per se do not matter, as factor endowments determine the comparative advantage of countries. Thus, resource-rich countries export primary products or/and resource-based manufactures; cheap and labour-abundant countries, like Viet Nam, specialize in low value added manufactures, while resource-scarce but rich countries supply sophisticated manufactures. This view implies that there is limited scope for policy to change the pattern of industrial production. If factor endowment is the determining force, why should policymakers be concerned about what to produce and export?

The good news for countries hoping to move up the industrial ladder is that evidence has shown that orthodox theory may be too simplistic for explaining trade and production patterns throughout the world. New research shows that externalities and learning effects derived from sectoral specialization matter and that shifts between activities do not occur automatically and at no cost. Thus, the production and trade structures of countries are not only determined by factor endowments, but also by domestic technological capability building. In fact, few would deny that skill acquisition, incremental learning and technological effort is behind the industrial success of South East Asia.

What is perhaps more interesting is that new evidence shows that not all sectors are equally beneficial for growth, and therefore, what a country produces and exports matters a great deal. This statement has significant implications for policy, and it is not surprising that the debate on structural change is now central to the policy agenda of most developing countries. What this also implies is that prior to devising policy instruments and building technological capacities, policymakers need to understand which sectors can help them achieve their goals. The criteria of 'desirability' obviously vary from country to country and will depend on national priorities which, among many other things, includes job creation, food security, diversification, import substitution, export competitiveness and fostering industrial backward and forward linkages.

Structural change is not easy to achieve. It requires the creation of sector-specific capabilities at the policy, institutional and firm level. Getting the macro conditions right and letting market forces allocate resources will not work. While private entrepreneurship will always be the driving force, governments can play a major role in achieving structural change by reducing the costs and risks associated with entry into new activities.

Rapid manufacturing growth in Viet Nam should not prevent policymakers from entering the debate. That structural change is a costly and lengthy process and that Viet Nam clearly needs to move up the technology ladder are good enough reasons to start thinking about how the future of Viet Nam's industry could look like.

Structural change assumes many forms. In its broadest conception, structural change is described as the shift towards manufacturing excellence both in production and trade. But structural change also takes place within manufacturing. Evidence suggests that technology intensive structures can lead to faster growth for the following reasons:

- *Over the long run, technology intensive activities tend to grow faster in trade than simple activities and also account for a greater share in total manufactured trade.* High-technology exports grew 10.2 percent between 1990 and 2007, well above exports of less sophisticated products. Despite the decrease in recent years due to the commodity price boom, complex exports (medium- and high-tech exports) continue to dominate world trade, accounting for 61.3 percent of total manufactured exports;

- *Technology intensive sectors are less vulnerable to entry by competitors and therefore enjoy higher and more sustainable margins.* Resource-based and low-technology activities are more exposed to competitive pressures, as the capabilities required to enter the industry are relatively low and therefore more accessible to newcomers. Competitive advantages in these sectors are often attributable to price rather than quality or brand names. In contrast, technology intensive activities call for more complex capabilities and processes that impose greater barriers to entry;

- *Technology intensive activities offer higher learning and productivity potential as well as greater spillover benefits to other activities.* Capabilities in technology intensive industries are grounded in shared disciplines, notably mathematics, physics, engineering and computing. Strong capabilities based on scientific knowledge can be adapted to the particular demands of other activities at a faster pace. As technology in these sectors also changes rapidly, learning and innovation become crucial for sustaining competitiveness.

This has important implications for Viet Nam's industry, which relies heavily on price competition in low-productivity low-technology sectors. As industry evolves, salaries rise and competition toughens, Viet Nam's industrial sector is likely to face even more pressures to move up the technology ladder.

As indicated in Section A, this report uses UNIDO's technology classification to shed light on structural change within manufacturing towards technology intensive sectors. The assumption is that a shift of the production and export structure towards 'complex' activities gives an indication of domestic technological deepening and upgrading.

Compared to other countries in the region, Viet Nam's industrial structure is technologically unsophisticated. The share of medium- and high-tech sectors in total MVA remains just above 20 percent and has not changed over the last few years (see Figure 5). Labour-intensive low-tech industries – mainly the garment and shoes cluster – account for more than 70 percent of Viet Nam's MVA. Only Cambodia among the comparators has less industrial muscle in technology intensive sectors than Viet Nam. Republic of Korea has the most sophisticated production structure and has even increased its share of medium- and high-tech MVA in recent years. Malaysia and Indonesia, two resource-rich Asian countries, face the opposite trend, with resource-based MVA having assumed a more prominent role in industry in recent years. This is attributable to the rise in commodity prices and demand for resource-based products, mainly construction materials, food and oil, in which both countries have a competitive edge.

Viet Nam's export structure in 2009 was the same as in 2000, with low-tech exports taking central stage in the country's export pattern (see Table 6). Within only nine years, Viet Nam's low-tech exports skyrocketed from US$ 4 billion to US$ 22 billion. When we put these figures in global perspective, we get a sense of Viet Nam's limited global impact. Low-technology exports account for only 0.2 percent of global trade. Although Viet Nam is making its presence felt in the international industrial scene, it still has a long way to go before it can become a truly global competitor in labour-intensive manufacturing.

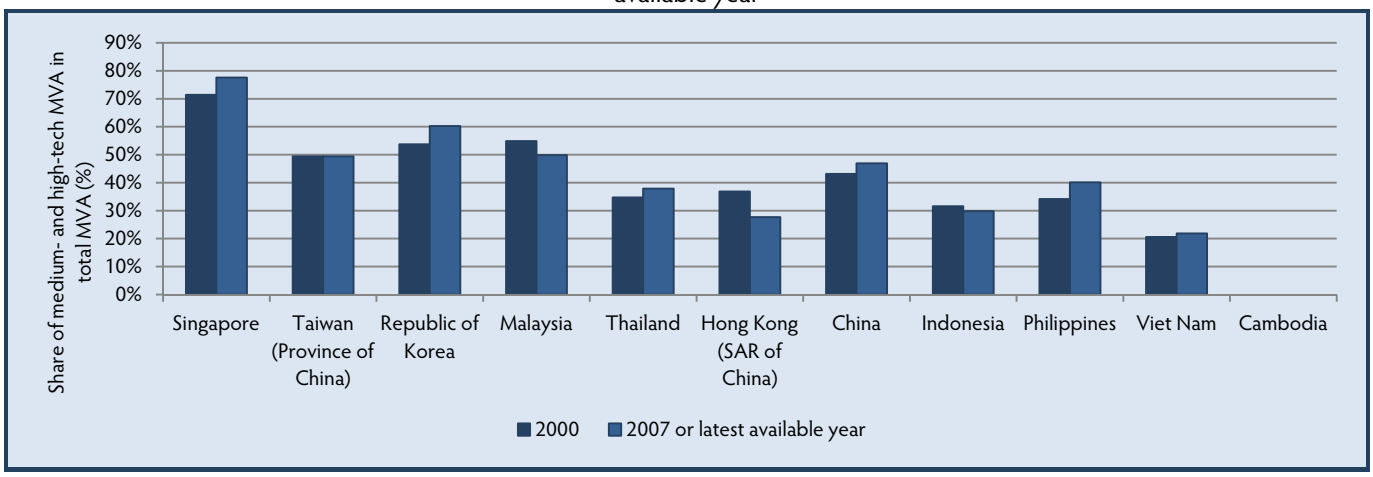
As mentioned earlier, Malaysia and Indonesia have experienced a revitalization of resource-based exports in recent years due to changing market demand. In the latter's case, resource-based exports account for nearly half of Indonesia's total manufactured exports, up from one third eight years earlier. However, the overall regional picture is that of technological sophistication of export products, with Taiwan (Province of China) leading the pack in high-

tech industries, mainly semiconductors, and Republic of Korea in medium-tech industries, mainly automobiles and ships.

China's structural change towards technologically complex sectors is possibly the most widely noted. Chinese high-tech and medium-tech exports now account for two thirds of its total manufactured exports, which together account for an astonishing 5.5 percent of world trade, up from less than 2 percent at the beginning of the decade. Despite the size difference, industrial development in China and Viet Nam has similar origins: central planning, abundant, cheap but disciplined labour, pronounced regional imbalances and technological backwardness at early stages in the industrialization process. These parallels make the Chinese case particularly relevant for Viet Nam.

Figure 6 sums up the evolution of Viet Nam's export structure towards more sophisticated products. On the whole, Viet Nam is moving in the right direction, albeit slowly. Manufactured exports now account for almost two thirds of Viet Nam's total exports. The real challenge for Viet Nam is to increase the technological sophistication of its industries. The country's ability to nurture private entrepreneurship in activities other than the traditional footwear and apparel sectors will be crucial. Moving up the technology ladder and taking the 'high road' to competitiveness is preferable to relying on industries with low salaries, low prices, low margins and, ultimately, 'immiserizing growth'.

FIGURE 5. Share of medium- and high-tech MVA in total MVA for Viet Nam and comparators, 2000 and 2007 or latest available year



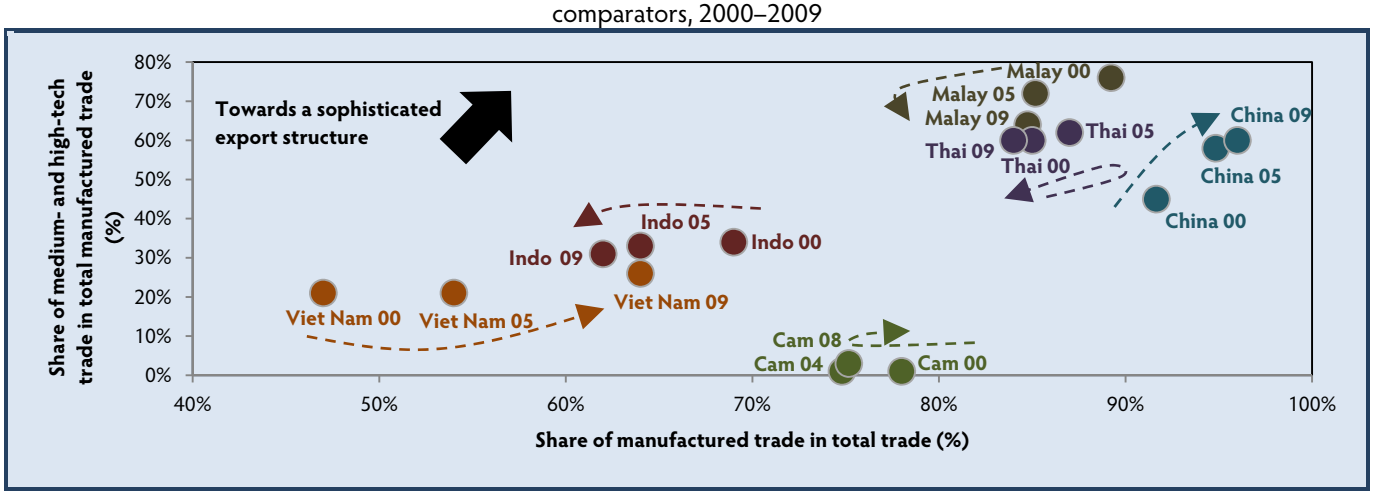
Source: UNIDO's INDSTAT.

TABLE 6. Technological structure of manufactured exports for Viet Nam and comparators, 2000–2009

Country	2000				2009			
	HT	MT	LT	RB	HT	MT	LT	RB
Viet Nam	11%	10%	65%	14%	12%	13%	62%	12%
China	21%	24%	45%	9%	32%	28%	32%	8%
Cambodia	0%	1%	93%	6%	0%	3%	96%	1%
Indonesia	15%	20%	32%	34%	7%	24%	23%	47%
India	5%	13%	47%	34%	10%	19%	31%	40%
Republic of Korea	35%	35%	18%	12%	30%	46%	11%	13%
Malaysia	55%	21%	10%	14%	43%	22%	13%	23%
Philippines	69%	12%	12%	7%	62%	18%	8%	13%
Taiwan (Province of China)	43%	28%	24%	4%	38%	32%	18%	11%
Thailand	32%	27%	22%	19%	24%	36%	17%	24%

Source: UN Comtrade.

FIGURE 6. Evolution of export structure towards manufactured exports and technology intensive exports for Viet Nam and comparators, 2000–2009



Source: UN Comtrade.

The Vietnamese government recognizes the advantages of moving into more technology intensive activities. *'Increasing the content of science and high technology in our products'* is mentioned at the beginning of the first paragraph of the general objectives of the Social Economic Development Plan for 2011–2015. A target of 40 percent high-tech production as a share of sectoral output by 2015 has also been set. Measures have already been taken to institutionalize this with the enactment of the High-Tech Law, which came into force on 1 July 2009, and focuses on the development of information technology, biotechnology, new material technology and automation technology. As the Ministry of Science and Technology continues to draft regulations to guide the implementation of this law, understanding the role of technology in industry and trade for Viet Nam is essential.

4.5. Product and market diversification

Diversification, both of products and of markets, is another key factor in industrial competitiveness. Recent findings reveal a positive relationship between industrial diversification and income levels (Imbs & Wacziarg, 2003). Low-income, slow growing countries need to diversify their production structures to achieve larger productivity gains. Other studies indicate that the same relationship holds true for export diversification (Carrère, Strauss-Kahn & Cadot, 2007). In short, it appears that diversification, understood as the entry into new activities through a discovery process, matters for competitiveness. According to Hausmann and Rodrik (2005), a broad industrial and export base facilitates the entry and exit of firms, which constitutes the foundation of a globally competitive economy. Productive firms enter and expand while less competitive ones close down.

Market diversification has received less attention in the literature, but it appears that the same principles apply. Exporting to many countries reflects an ability to compete internationally, making exporters less vulnerable to external shocks, demand slowdown and competition.

In short, the externalities of accessing new markets with new products lie at the core of a country's path to industrial competitiveness. Technologies need to be mastered and marketing channels created to open up potential export outlets. Specialized skills need to be developed and institutions created to support firms engaged in new product lines. Trade diversification may be a costly, risky and long-term process, but the potential developmental benefits should not be underestimated.

The following section deals with product and market diversification in Viet Nam. This is particularly relevant, as Viet Nam is struggling to produce new non-traditional export products and enter new markets.

4.5.1. Product diversification

Diversifying for the sake of it may not be the best policy choice. In fact, product concentration can be justified by world demand – it makes no sense to diversify into product lines that have little or no market demand. Analysis of product diversification requires an exploration not just of the country's export structure but also of the world's export

structure. The logic is that if a country has an export structure that is similar to that of the world, then its industry conforms to global demand. The manufactured product diversification index presented in this paper and explained in the box below, provides insights into Viet Nam's diversification pattern vis-à-vis comparator countries.

Viet Nam ranks 8th out of ten countries in the index (see Table 7), having gained one position over the Philippines. This suggests high product concentration in a limited range of export products. This should be a serious concern for Viet Nam's export sector, as it is consequently highly exposed and vulnerable to changing demand and third country competition.

Viet Nam's top five manufactures in 2009, in the order of export value, were footwear, articles of apparel, furniture, woven women's/girls' clothing and woven men's/boys' wear. These together accounted for more than 39 percent of manufactured exports, down from 49 percent in 2000 (see Figure 7). The level of concentration in Viet Nam is similar to that of Malaysia, though the nature of the products is very different: computer equipment, office equipment and semiconductors are among Malaysia's top five manufactured exports. Cambodia shows a worrying concentration pattern with articles of apparel accounting for nearly half of manufactured exports.

BOX 3. Methodology of the manufactured product diversification index

This methodology was developed by UNCTAD to create a product diversification index (UNCTAD, 2011). However, there is one major difference between UNCTAD's index and the one used in this report. The present index only considers diversification of manufactured exports, excluding primary exports and other transactions (it is thus a manufactured product diversification index).

The manufactured product diversification index shows the extent to which a country depends on specific products relative to world exports. In other words, it compares a country's export structure with the world's export structure.

The formula used is as follows:

$$DX_j = 1 - \frac{\sum[h_{ij} - h_i]}{2}$$

Where *DX* is the manufactured diversification index value of country *j*
$\sum$ is the sum of all values in brackets
hij is the share of product *i* in total manufactured exports of country *j*
hi is the share of product *i* in total world manufactured exports.

Once the manufactured diversification index values have been obtained, values are standardized based on the formula for the calculation of the CIP index. Yet to obtain a ranking where 1 is highest (more diversified) and 0 is lowest (less diversified), we have to reverse the value order (i.e. one minus standardized manufactured product diversification index value).

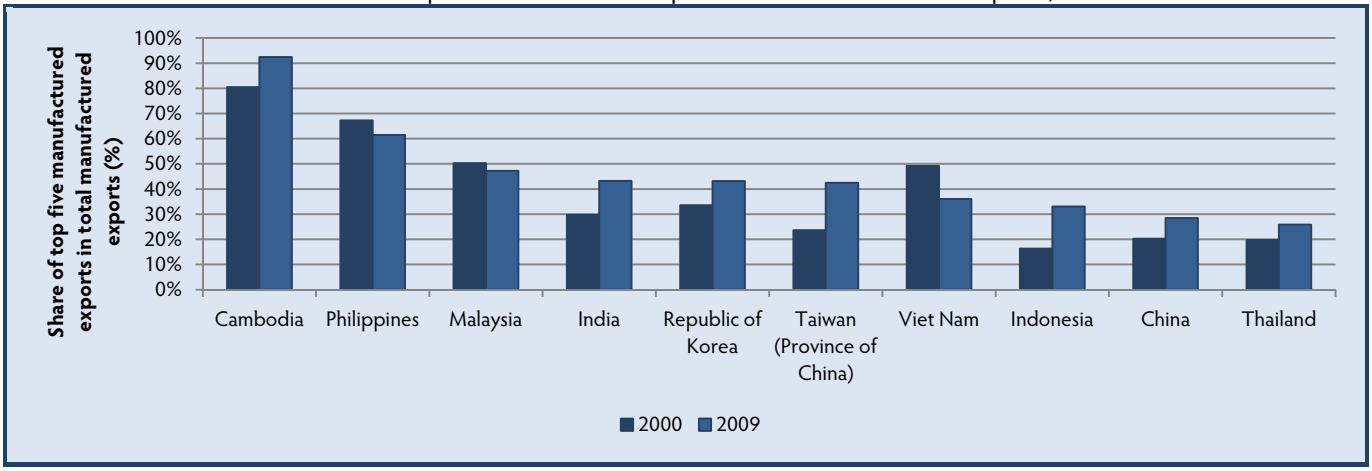
Source: UNIDO.

TABLE 7. Product diversification index, 2000–2009

Ranking		Country	Index value	
2009	2000		2009	2000
1	2	Thailand	0.66	0.62
2	3	China	0.60	0.56
3	1	Republic of Korea	0.60	0.64
4	6	Malaysia	0.52	0.48
5	4	Taiwan (Province of China)	0.52	0.56
6	7	India	0.52	0.40
7	5	Indonesia	0.48	0.52
8	9	Viet Nam	0.42	0.35
9	8	Philippines	0.38	0.38
10	10	Cambodia	0.08	0.08

Source: UN Comtrade.

FIGURE 7. Share of top five manufactured exports in total manufactured exports, 2000–2009



Source: UN Comtrade.

4.5.2. Market diversification

While a country's export structure is determined by factor endowments and technological capabilities, market orientation is normally determined by another set of factors, including geography, transport logistics, trade agreements, the nationality of foreign firms present in the country and even historical ties (for instance, to formal colonial powers). Strategy is an important factor in market diversification, as policymakers can work towards developing links with rapidly growing markets to lock in economic gains.

Viet Nam's manufactured trade is far from concentrated. Viet Nam ranks third in the region in terms of market diversification, with only China and India ranking higher (see Table 8). Whether this was an intentional strategy based on export promotion and trade policy or driven by other factors is not clear. Whatever the case may be, the fact is that Viet Nam's market diversification helps the country protect itself from weak demand in specific markets and the emergence of strong competitors in the world's largest markets.

Viet Nam's favourable performance in the market diversification index is related to its strong presence in the world's largest markets, namely North America (US and Canada), the European Union and East Asia (see Figure 8). The strong orientation towards the North American market is worth noting to the extent that it has now become the main destination of Viet Nam's manufactured exports. In 2000, exports to North America accounted for only 4 percent of total manufactured exports.

BOX 4. Methodology of the market diversification index

The methodology of the market diversification index follows the logic of the manufactured product diversification index explained above. It shows the extent to which a country depends on specific markets for its manufactured exports relative to how important those markets are in world manufactured imports.

For this exercise, we consider eight markets: the EU, US, sub-Saharan Africa, Latin America, East Asia, South Asia, Middle East and North Africa and the 'rest' category; we only take the aggregated manufactured export category as if it was only one product. The formula used is the following:

$$DM_j = 1 - \frac{\sum[h_{ij} - h_i]}{2}$$

Where *DM* is the market diversification index value of country *j*
$\sum$ is the sum of all values in brackets
hij is the country's market share of manufactured products *i* in the country's total manufactured exports to the world's *j*
hi is the market's import share of all manufactured products *i* in total world manufactured imports.

Once the market diversification index values have been obtained, values are standardized following the formula for the calculation of the CIP index. Yet to obtain a ranking where 1 is highest (more diversified) and 0 is lowest (less diversified), we have to reverse the value order (i.e. one minus standardized market diversification index value).

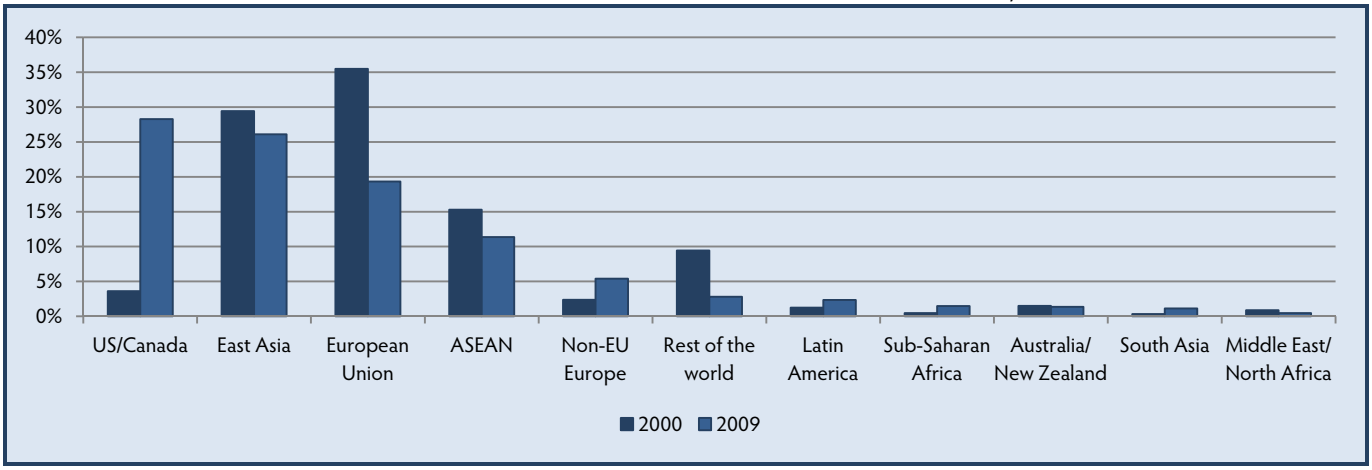
Source: UNIDO.

TABLE 8. Market diversification index, 2000–2009

Ranking		Country	Index value	
2009	2000		2009	2000
1	3	China	0.78	0.72
2	1	India	0.74	0.81
3	7	Viet Nam	0.70	0.67
4	2	Republic of Korea	0.69	0.73
5	6	Indonesia	0.67	0.67
6	4	Thailand	0.65	0.69
7	9	Philippines	0.64	0.64
8	8	Malaysia	0.62	0.65
9	5	Taiwan (Province of China)	0.57	0.68
10	10	Cambodia	0.46	0.53

Source: UN Comtrade.

FIGURE 8. Viet Nam's manufactured trade concentration in main markets, 2000–2009



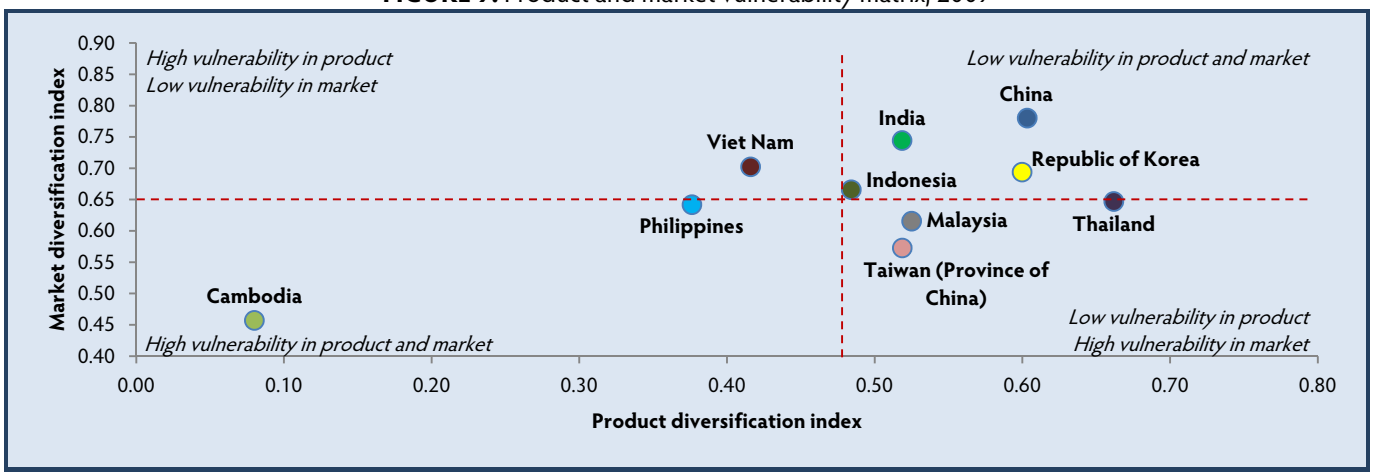
Source: UN Comtrade.

4.5.3. Vulnerability matrix

Figure 9 combines the manufactured product diversification index and the diversification market index to produce a vulnerability matrix in which countries can be positioned according to their index values. Four vulnerability quadrants are created using the index value averages. The rationale is that higher diversification (in products and markets) reduces vulnerability.

China, Republic of Korea, India and Indonesia are characterized by high diversification both in terms of products and markets and hence face low vulnerability to changing demand, price fluctuations and third country competition. At the other end of the spectrum are Cambodia and the Philippines. The case of Cambodia is particularly worrisome: not only does the country rely on few export products – all of which are bottom-end, labour-intensive manufactures – it also concentrates more than two thirds of its manufactured exports in North America, making it highly vulnerable to shifts in demand. Viet Nam stands on its own with high vulnerability in products and low vulnerability in markets. Since signing the Bilateral Trade Agreement (BTA) with the US, Viet Nam has experienced a much more diversified pattern of export destinations. Yet the BTA has not triggered diversification into new and more productive activities. This suggests that trade liberalization does not induce structural change as defined in this report. Industrial diversification calls for specific industrial policies that nurture private entrepreneurship and the development of new manufacturing activities.

FIGURE 9. Product and market vulnerability matrix, 2009



Source: UN Comtrade.

4.6. Viet Nam's performance in the world's most dynamic manufactured exports

The debate on structural change is not just about technological transformation. Although technology matters, the ability to shift production and export structures quickly to serve changes in global demand is another important component of competitiveness. Countries that heed and adapt to meet new market demands demonstrate readiness to compete. But building capabilities to respond to changing demand patterns is not an easy task as industrialization is a slow-gestating and path-dependent process. It may take decades to build competitive muscle in sectors where technology and skills are simply not transferable to other sectors. Indeed, the rigidity of production and export structures is the main obstacle to competing in a changing environment.

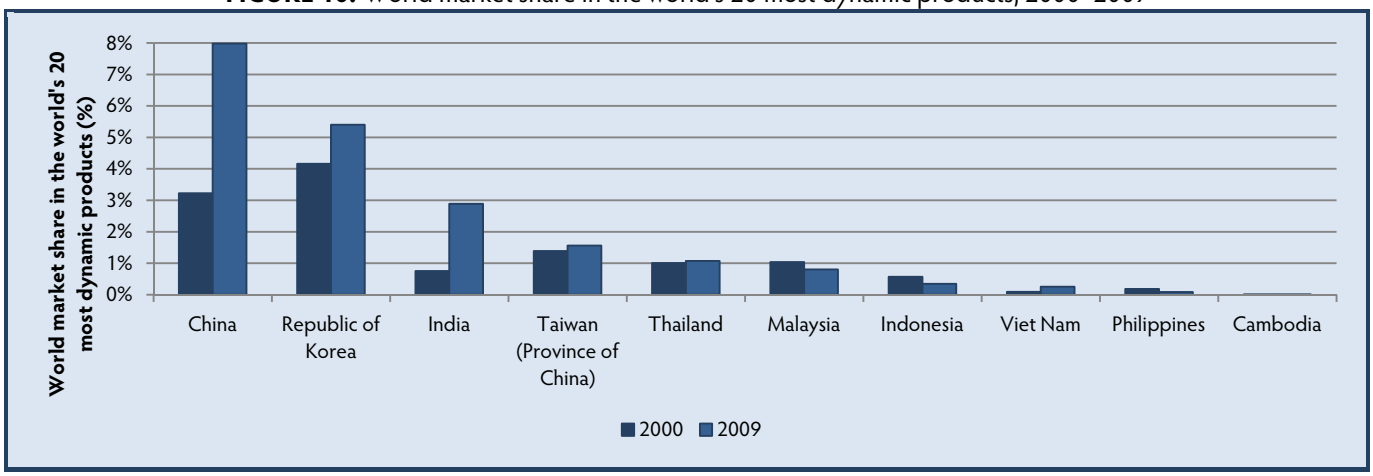
This section examines Viet Nam's performance in the world's 20 most dynamic products to assess the country's ability to quickly shift production and export structures to meet global demand. It must be noted that luck also plays a role, and changes in demand can benefit countries with specific factor and resource endowments. For instance, the recent boom in the construction sector in Asia and China and India's high demand for oil, minerals and agro-based products offers significant opportunities for resource-rich countries. Our analysis will therefore examine countries' performance in individual products. An export basket containing several dynamic products points to a responsive industrial sector.

Figure 10 presents world market shares in the world's 20 most dynamic exports for Viet Nam and the comparator countries between 2000 and 2009. Countries with notable gains in world market share are China, India, Republic of Korea, a mixture of NICs and the largest emerging economies with abundant resource endowments.

In contrast, most Southeast Asian countries have seen their world market share reduce or remain unchanged during the same period, with the exception of Viet Nam and, to a lesser extent, Indonesia. This implies that Viet Nam has been able to increase its exports of products with the highest growth in global demand. Indeed, Viet Nam exports 17 out of the 20 most dynamic products at levels equal to or higher than the global average annual growth rates. The only three exceptions are fixed vegetable oils, not soft (SITC 422), ferrous waste/scrap (282) and television receivers (761).

It should be noted that several dynamic goods in our list of the world's 20 most dynamic exports are closely interlinked. For example, iron ore/concentrates (SITC 281); iron/steel pipe/tube (679); ferrous waste/scrap (282); iron/steel/aluminium structures (691) are mostly ferrous products. Similarly, heavy petrol/bitum oils and residual petroleum products belong to the oil sector. Countries that happen to have a strong steel or oil industry thus have a favourable position in the analysis of dynamic exports.

FIGURE 10. World market share in the world's 20 most dynamic products, 2000–2009



Source: UN Comtrade.

Viet Nam's performance in terms of dynamic structure and capacity indicators has been quite stable over the period 2000 to 2009 (see Table 9). Although Viet Nam has increased its dynamic exports per capita ninefold, it only translates into an improvement of one position, from seventh to sixth. Similarly, in terms of dynamic exports over total manufactured exports, Viet Nam improved from sixth position in 2000 to fifth in 2009. The rising share of Viet Nam's dynamic exports from 8 percent in 2000 to 15 percent in 2009 indicates that the country is increasingly responding to the dynamics of world demand.

Yet despite improvements in the exports of dynamic products, Viet Nam, as of 2009, was still a net importer of this product group. While exports of all dynamic products stood at US$ 5.5 billion in 2009, imports amounted to over US$ 13 billion in the same year. As a matter of fact, Viet Nam experienced trade deficits in 14 out of the 20 most dynamic products. The top dynamic export in 2009, heavy petrol/bitum oils, accounted for 72 percent of the trade deficit (US$ 5.5 billion).

Table 10 presents the breakdown of the most dynamic products by technology sector. Resource-based products accounted for 42 percent of dynamic exports in 2009 and also had the second highest annual growth rate during the period 2000 to 2009, with an average growth rate of 14.2 percent. This is primarily due to heavy petrols/bitum oils[6] (SITC 334), the growth of which – from US$ 156 billion in 2000 to US$ 490 billion – is responsible for nearly one quarter of the total increase in dynamic exports.

Growth in exports of heavy petrols/bitum oils for our group of benchmarking countries was higher than that for the world as a whole, or 17 percent per annum versus 13 percent globally from 2000 to 2009. This may not be surprising given that only one of the countries was a member of OPEC. Indonesia was the only ASEAN OPEC member until it withdrew in 2008, when the country became a net importer of oil (Thomson Financial News, 2008). Indonesian officials have criticized OPEC's reluctance to boost supply and its lack of concern about the impact of this decision on its smallest members. However, industry analysts also blame successive Indonesian governments' management of the industry and lack of investment in production. This is quite a worrying sign for Indonesia. To some extent, dynamic export performance includes an element of luck when demand is driven by resource-based goods, but losing share in a resource that is available in the country is indicative of the sector's poor competitiveness. Indonesia had 4.3 billion barrels of proven oil reserves as of January 2007.

UNIDO's Industrial Development Report 2009 shows a fundamental shift in global demand between the late 1990s and the first half of 2000s. Demand for high-tech products gave way to an unprecedented rise of resource-based manufactures fuelled by China and India's shortage and appetite for building materials, primarily steel and iron. As a consequence, demand peaked, supply tumbled and prices soared.

6 Full product description: 'Petroleum oils and oils obtained from bituminous minerals (other than crude); preparations, nes, containing by weight 70% or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations'.

TABLE 9. Capacity and structure of Viet Nam and comparators' exports in the world's top 20 most dynamic exports, 2000–2009

Dynamic exports per capita					Dynamic exports in total manufactured exports				
Ranking		Country	Value ($ per ps)		Ranking		Country	Value ($ per ps)	
2000	2009		2000	2009	2000	2009		2000	2009
1	1	Republic of Korea	480.6	2,055.5	3	1	India	12%	38%
2	2	Malaysia	359.9	920.0	1	2	Indonesia	15%	32%
3	3	Thailand	77.4	245.0	2	3	Republic of Korea	14%	28%
6	4	China	13.7	104.0	4	4	Malaysia	10%	18%
4	5	Indonesia	30.5	100.3	6	5	Viet Nam	8%	15%
7	6	Viet Nam	7.0	63.1	5	6	Thailand	8%	13%
8	7	India	4.3	49.0	7	7	China	8%	12%
5	8	Philippines	21.2	24.3	8	8	Philippines	5%	6%
9	9	Cambodia	0.1	3.8	9	9	Cambodia	0%	2%

Source: UN Comtrade.

TABLE 10. Exports in the world's 20 most dynamic products by technology sector, 2000–2009

	Global exports (US$)		Average annual growth, 2000–2009	Contribution to 2009 manufactured exports
	2000	2009		
Resource-based	223,791,479	740,318,327	14%	42%
Low-tech	76,589,694	233,538,889	13%	13%
Medium-tech	79,593,214	258,970,930	14%	15%
High-tech	132,405,542	533,017,842	17%	30%
Total	**512,381,928**	**1,765,847,997**	**15%**	**100%**

Source: UN Comtrade.

TABLE 11. Viet Nam's performance in the world's 20 most dynamic products, 2000–2009

Technology classification	Code	Product	World exports		Viet Nam's exports	
			2009 value (US$ thousands)	Growth rate, 2000–2009	2009 value (US$ thousands)	Growth rate, 2000–2009
Resource-based	281	Iron ore/concentrates	55,023,738.99	22%	37,966.58	22%
High-tech	871	Optical instruments nes	68,757,895.55	20%	1,817.61	68%
Resource-based	283	Copper ores/concentrates	28,394,010.04	18%	20,473.48	39%
Resource-based	422	Fixed vegetable oils not soft	27,201,214.16	18%	17,000.36	-12%
High-tech	542	Medicaments incl. vet	303,958,156.25	17%	41,937.33	28%
Resource-based	282	Ferrous waste/scrap	29,800,375.49	17%	1,249.61	-13%
High-tech	541	Pharmaceuticals except medicaments	121,209,366.91	16%	6,015.97	36%
Low-tech	691	Iron/steel/aluminum structures	47,529,349.56	15%	173,942.61	38%
Medium-tech	793	Ships/boats/etc	139,001,130.69	15%	274,641.49	68%
Resource-based	335	Residual petroleum products	25,651,996.57	14%	2,196.22	21%
Low-tech	679	Iron/steel pipe/tube/etc	69,269,932.12	14%	126,426.98	25%
Resource-based	334	Heavy petrol/bitumen oils	490,486,624.41	14%	962,558.93	17%
Medium-tech	562	Manufactured fertilizers	38,150,791.18	13%	108,443.13	58%
High-tech	751	Office machines	39,092,423.64	13%	1,209,266.10	186%
Resource-based	421	Fixed vegetable oil/fat, soft	24,316,423.52	13%	22,009.92	16%
Medium-tech	761	Television receivers	81,819,008.04	13%	64,814.27	10%
Resource-based	288	Non-ferrous base metal waste nes	23,056,188.47	12%	8,308.89	65%
Low-tech	899	Miscellaneous manufactured articles nes	60,451,109.42	12%	48,759.11	16%
Low-tech	897	Jewellery	56,288,497.58	12%	1,874,842.97	55%
Resource-based	48	Cereal etc flour/starch	36,387,755.29	12%	125,022.91	16%

Source: UN Comtrade.

Table 11 above presents the most dynamic manufactured exports (above the cut-off point of US$ 20 billion between 2000 and 2009). Dynamic exports of ferrous materials are found in the low-tech[7] as well as in the resource-based sector. Global exports of the four ferrous products[8] nearly quadrupled from 2000 to 2009, reflecting the demand for steel products for construction and manufacturing, particularly in India and China, though these countries are also emerging as suppliers. China has become the largest exporter of steel products within our benchmarking group with exports of US$ 18 billion in 2009, followed by India at US$ 8 billion in the same year. Republic of Korea remains the third largest exporter in our group; however, its exports of these products only make up half of its imports (US$ 5 billion versus US$ 9.5 billion in 2009). Although the steel industry has witnessed booming demand, profitability has declined significantly, not least due to increased input costs. After decades of minor price fluctuations around 14 cents/dmtu, the price of iron ore began rising dramatically in 2004 to reach around 150 cents/dmtu by 2010.[9] Overcapacity and inefficiency of production is an issue, particularly in China. In addition, imports to the EU market, which was the destination for nearly one third of this product group in 2008, fell by 42 percent from 2008 to 2009.

The Government of Viet Nam considers the steel industry to be important strategically and explicit targets to increase production are specified in the draft SEDP 2011–2015 (the objective was an increase in capacity of 7 million tonnes of processed steel products and 4.5 million tonnes of rough steel by 2010). MoIT has also formulated specific sector master plans. Emphasis is put on expanding and modernizing capacity to reduce Viet Nam's import dependence to meet the demands of industrial growth. In particular, domestic production of pig iron should provide the majority raw materials for ingot steel mills, as well as expand export capacity.[10] In 2009, Viet Nam exported US$ 537 million of iron and steel products, with an average growth rate of 34 percent per annum during the period 2000 to 2009. However, there are major fluctuations in the export of these products. Flat rolled iron/steel products (SITC 673), for example, increased from US$ 17 million in export value in 2007 to US$ 673 million one year later. Rumours abound that much of Viet Nam's steel exports are actually re-exports. Overcapacity in neighbouring China (Asia Pulse/XIC, 2006) combined with EU temporary tariffs placed on steel pipes from China in April 2008 (Wall Street Journal, 2009) may provide a more likely explanation than production capacity increasing 40 times within a year.

In our list of the 20 most dynamic products in the world, the Optical Instruments (SITC 871) category is the second largest driver of growth. Asia has come to dominate exports in optical instruments over the last nine-year period; exports from China and Republic of Korea alone were worth US$ 44 billion of global exports totalling US$ 57 billion in 2009. These two countries increased their exports by nearly US$ 43 billion while the rest of the world only increased their exports by US$ 3 billion from 2000 to 2009. China is also the largest importer of this category, accounting for 27 percent of global imports in 2009. Optical instruments can be used in a variety of industries; around one third of sales are used for sighting, tracking and firing control systems in the arms industry (although much of this may not appear in the trade data, as it is US companies producing for the US defence industry).[11]

Optical test and inspection equipment is the next largest sub-category, which is mostly used for quality inspection and control in other industries such as steel or automobiles. Over 90 percent of China's imports and exports are in the 'Optical Instruments not elsewhere specified' category (SITC 87193), which likely includes quality control equipment and parts/accessories for this category. Hence, China's growth in manufacturing would account for much of this category's increase in demand. Republic of Korea exports a large quantity of 'Optical Instruments not elsewhere specified' as well as parts for optical instruments (SITC 87199). It is the second largest supplier of these sophisticated components for China's high-tech exports after Japan.

7 SITC 691 also includes aluminum structures and parts, but this is of immaterial value in the group.

8 281 Iron ore/concentrates, 679 Iron/steel pipe/tube/etc, 282 Ferrous waste/scrap, 691 Iron/steel/alum structures.

9 http://www.indexmundi.com/commodities/?commodity=iron-ore&months=180

10 Decision No. 145/2007/QD-TTg of 4 September 2007, Approving the Master Plan on the Development of Viet Nam's Steel Industry in the 2007-2015 Period, With the 2025 Vision Taken Into Consideration.

11 http://business.highbeam.com/industry-reports/equipment/optical-instruments-lenses

VIET NAM INDUSTRIAL COMPETITIVENESS REPORT 2011

Section C:

BENCHMARKING SECTORAL COMPETITIVENESS

5. Sectoral analysis

This section benchmarks Viet Nam's performance in each product sector (RB, LT, MT and HT)[12] with that of comparator countries and assesses the performance of all manufactured exports within each sector. For the latter, we classify products into four categories according to Viet Nam's gains (or losses) in global market share for each product, as well as growth in global demand for that product during 2000 to 2009.

Viet Nam's sectoral competitiveness can be assessed by analysing its export impact in world share, and the international dynamism and demand of the product (measured by the annual growth of the product in world markets). Box 5 presents the methodology for the classification of Vietnamese products in four categories based on their export performance.

It is worth noting that this analysis is not conclusive as it only focuses on export performance. To fully assess sectoral competitiveness, we would need to conduct an in-depth analysis of the impact on domestic demand and the extent and complexity of the sector's industrial capabilities. This goes well beyond the scope of this report. Despite the limitations, the following analysis provides key insights into sectoral performance which reflect the country's ability to compete internationally.

5.1. Resource-based manufactures

Resource-based products are based on agricultural products and other simple manufactures derived from extractive industries.[13] With the exception of the oil processing industry and some chemicals, resource-based products require relatively simple technologies and low-skilled labour. The competitiveness of these sectors is closely linked to the given country's natural resources endowment and price fluctuations in the international market.

The desirability of resource-based manufactures as a means for economic development is a complicated question. Manufacturing comprising higher levels of technological content has been the route to development taken by the majority of today's developed countries (see discussion in the structural change chapter). However, there have been exceptions, notably New Zealand and Norway.[14] Thus, the key question is whether a resource-based product can be 'de-commodified',[15] hence becoming less vulnerable to price fluctuation in the international market.

Globally, the share of exports of resource-based manufactures in total manufactures has increased from 17.7 percent in 2000 to 21.5 percent in 2009. Nearly one third of this growth was driven by exports of heavy petrol/bitum oils and price increases for the period. In 2009, heavy petrol/bitum oils accounted for 25.3 percent of resource-based exports with an export value of US$ 490 billion, more than five times that of the second product, paper/paperboard.

The soaring demand for non-renewable resource-based (hereafter: 'non-renewable') products is evident in Table 13, with annual growth rates between 2000 and 2009 reaching 13 percent, almost double that of renewable resource-based (hereafter: 'renewable') goods. China is the largest importer of the non-renewable group, with import values in 2009 reaching US$ 81.4 billion. Except for Cambodia, the rest of our benchmarking countries have been able to tap into the Chinese market for non-renewables. India is the most noticeable, with its export value to China increasing from US$ 138 million in 2000 to US$ 4.8 billion in 2009. Viet Nam's exports to China have also risen 16 percent per year, from US$ 58 million in 2000 to US$ 230 million in 2009.

Nevertheless, the structure of non-renewable exports of the benchmarking countries is problematic. While global demand for heavy petrol/bitum oils – the least refined among manufactured oil products – accounts for 65 percent of demand for the overall group, this product represents a much higher share in total non-renewable exports from China (73 percent), India (77 percent), Republic of Korea (88 percent), Malaysia (73 percent), Thailand (85 percent), Taiwan (Province of China) (92 percent) and Viet Nam (75 percent).

12 Resource-based, low-technology, medium-technology and high-technology.

13 For example, food processing, simple wood products, products of petroleum refining, dyeing, leather, precious stones and organic chemicals.

14 Both New Zealand and Norway are on the IMF's list of advanced economies, and their manufactured export structure relies heavily on resource-based products. During 2005–2009, resource-based products, on average, accounted for 61 percent and 40 percent of manufactured exports for New Zealand and Norway, respectively.

15 Kaplinsky (2006) defines 'de-commodification' as a "process whereby products benefit by raising barriers to entry".

BOX 5. Classification of Vietnamese products in four categories

- *Champions:* a Vietnamese champion export is a highly dynamic product – growing above the average of world exports – with a world market share gain. Successful exporters tend to have an important number of champion exports, reflecting a country's ability to gain world market share in the most dynamic and demanded products;
- *Underachievers:* these exports are highly dynamic in world markets, but Viet Nam is losing world market share. Such exports are considered 'lost opportunities' as the country is failing to compete in fast growing products;
- *Overachievers:* overachiever exports are not very dynamic products – they grow below the average of world exports – and yet Viet Nam is gaining world market share. This tends to be a common feature of many resource-rich developing countries as their major exports experience sluggish growth in world demand;
- *Decline:* products from this group are slow growing exports in world markets where Viet Nam is losing world market share. It must be noted that it is not necessarily a bad sign for Viet Nam to have declining exports if they are balanced out by champion exports. This is indeed a feature of many industrialized countries that lose competitive edge in slow growing, labour-intensive exports while strengthening the position of high value added and technology intensive exports.

TABLE 12. Classification of Viet Nam's manufactured exports

		Global demand	
		Above average	Below average
Viet Nam's change in global market share	Gain	Champion	Overachiever
	Lose	Underachiever	Decline

Source: UNIDO.

TABLE 13. Exports of resource-based groups for Viet Nam and comparators, 2000–2009

Non-renewable resource-based exports				Renewable resource-based exports			
Country	2009 Export value (US$ thousands)	Growth rate, 2000–2009	Change in world market share	Country	2009 Export value (US$ thousands)	Growth rate, 2000–2009	Change in world market share
India	30,085,588	36%	3%	China	77,186,016	18%	4%
Republic of Korea	25,129,279	11%	-1%	India	29,079,445	12%	1%
China	17,259,594	20%	1%	Indonesia	24,498,807	10%	0%
Taiwan (Province of China)	11,701,874	22%	1%	Thailand	23,100,726	11%	1%
Indonesia	9,179,641	9%	0%	Malaysia	22,952,704	11%	0%
Malaysia	7,540,528	12%	0%	Republic of Korea	20,129,510	8%	0%
Thailand	7,407,187	15%	0%	Taiwan (Province of China)	9,544,069	9%	0%
Viet Nam	1,275,074	15%	0%	Philippines	3,417,591	9%	0%
Philippines	1,115,141	3%	0%	Viet Nam	3,272,077	21%	0%
Cambodia	2,108	49%	0%	Cambodia	24,986	-10%	0%
All countries	**752,703,740**	**13%**		**All countries**	**1,179,990,649**	**7%**	

Source: UN Comtrade.

To date, Viet Nam's oil exports have tended to include unrefined products, namely crude oil (US$ 6.2 billion in 2009) and heavy petrol/bitum oil (US$ 962 million). In the near future, it would be better for the country to move in the opposite direction, meaning increasing its share of gasoline products. The government seems determined to achieve this: in 2009, Viet Nam established its first oil refinery, Dung Quat, which is set to produce a third of Viet Nam's refined petroleum needs in the future; within the next 10 years, the government also plans to build at least two more refineries, which will help to further reduce Viet Nam's oil/bitum exports. In addition, eight types of gasoline produced by the Dung Quat refinery have recently been awarded an international ISO certificate by the Norway-based organization Det Norske Veritas (DNV) (Minh, 2011).

BOX 6. 'De-commodifying' resource-based exports

Niche markets are characterized by their extensive and demanding process of certification. For example, in order to receive the Forest Stewardship Council (FSC) certification, wood products have to be accompanied by a "chain of custody" which tracks their path from forest to customers. FSC standards are set at each stage of processing, transformation, manufacturing and distribution. For the agricultural sector (including aquaculture), the Global G.A.P certification requires traceability at a very detailed level. Strict standards are then set to minimize negative environmental impacts; reduce the use of pesticides and other chemical inputs; and ensure workers' health and safety as well as animal welfare.

Through such an extensive and demanding process of certification, barriers to entry are raised and resource-based products are de-commodified. De-commodification has become increasingly important as it shows that falling prices are not an inescapable outcome, even for markets which require relatively simple technology and low-skilled labour.

Source: Kaplinsky, 2006.

Another problem concerns product prices. Sooner or later, Viet Nam's oil refineries will have to import all crude oil used for the refining process like many of their regional competitors, which implies that prices will largely depend on refining capacity.[16] In order to have globally competitive prices, Viet Nam should consider increasing its refining capacity to a much higher level than its present one.

As regards the export of renewable products, China leads the way amongst the 10 benchmarking countries in terms of export value, reaching US$ 77 billion in 2009. However, the average growth rate of renewable exports during the period 2000 to 2009 is relatively low in comparison to medium- (22 percent) or high-tech exports (25 percent), and its share in total manufactured exports from China has gradually decreased from 7.6 percent in 2000 to 6.6 percent in 2009. This has an important implication for other countries. Kaplinsky argues that manufactures produced by developing countries have faced declining terms of trade, particularly since China entered the manufacturing scene in full force (Kaplinsky, 2006). He suggests that China's sheer size means that it can 'disequilibrate' pricing patterns in a way that has never previously been seen and he finds that prices fall for any product of which China is a significant exporter. Thus, given the relatively low growth of China in renewable exports compared to medium- or high-tech ones, the relative attractiveness of this group may be increasing.

For Viet Nam, renewable export value is nearly three times that of non-renewables, and the growth rate is 1.5 times higher. These are encouraging figures, since Viet Nam is not endowed with huge reserves of non-renewable resources. The country should strive for even higher growth in renewable exports, as Viet Nam is currently still a net importer of this group.

Analysis

Based on the methodology described earlier, Annex B classifies Viet Nam's resource-based exports into four categories: champion, overachiever, underachiever and decline. Three out of five champions with above average export values are agricultural products, denoting the significance of this sector in Viet Nam. Although agricultural output is very high, productivity is low, not least due to the size and distribution of plots of land. However, this is changing as a result of the regrouping of land plots and the mechanization of cultivation processes.[17]

Four out of five champions belong to the renewable group, which is a good sign. Three points should be made about the performance of these products.

First, besides the EU, Viet Nam has been able to target the largest markets for such exports, namely the US, Japan, China and Russia. Export market portfolios also show a good diversification pattern, with the top market accounting for only 14 to 18 percent of total exports in most cases.[18] For rubber tyres/treads, the tariff level of 35 percent imposed by the US on exports from China since 2009 may open up more opportunities for firms in Viet Nam to increase their US market share.

16 Currently, Dung Quat's capacity is 148,000 bbl/d while the figures for the smallest refineries in Singapore and Republic of Korea are 285,000 bbl/d and 275,000 bbl/d, respectively.

17 Localities which have implemented the regrouping of land and the mechanization of cultivation processes report increases in productivity. Even so, this practice is still not widespread due to the lack of local experts, inadequate funding and unwillingness by farmers to accept change.

18 The only exception is *Prepared/Preserved Vegetable Root/Tuber (056)*, of which Viet Nam concentrates one third of its export value in Russia.

BOX 7. Developing the fisheries sector: Lessons from Norway and Chile

Although it is a small country, Norway has one of the most reputable fisheries sectors in the world. Norwegian seafood is exported to more than 140 countries, with export turnover reaching nearly US$ 7 billion in 2009. Norway's reputation is attributed in part to effective efforts of the Norwegian Seafood Export Council (NSEC), whose activities focus on three main areas: joint marketing; market information; and communication and reputational risk management. In joint marketing, NSEC implements hundreds of marketing projects each year in 25 different countries in order to establish a reputation and, subsequently, demand for Norwegian seafood. This is a good foundation which individual exporters can take advantage of to promote their own seafood exports all over the world. Moreover, NSEC also serves as the main source of market information for the Norwegian fisheries sector. Individual exporters can conveniently access a vast array of seafood related information, from trends and developments in global seafood trade to import quotas, tariff rates and trade barriers in various markets. Last but not least, NSEC engages in reputational risk management activities to secure and strengthen the image of Norwegian seafood products. It is ready at all times to provide updated and accurate information about Norwegian seafood exports as well as the fisheries sector. In addition to the three main activities above, NSEC also helps explore markets for 'new products', which, despite their current limited share in Norwegian seafood exports, are considered to have potential as innovative additions to the established export structure.

NSEC is owned by the Ministry of Fisheries and Coastal Affairs, and is funded through fees levied on all Norwegian seafood exporters. In addition, all Norwegian seafood exporters must comply with NSEC's rules and standards. Compliance ensures that individual exporters do not engage in unhealthy competition, which may ruin the reputation NSEC has strived to establish.

Chile represents another innovative approach to the development of the fisheries sector. The Trade Commission of Chile (ProChile) provides salmon farmers with funds which gradually decrease. The funding ratio starts at 1:1, which means one dollar from the government for each dollar of private investment in salmon farming. This funding gradually decreases and phases out completely after five years, from which point salmon farmers must carry all costs themselves.

The government covers much of the advertising costs in the beginning; however, the long-term export development programmes for the salmon industry have been successful due to good cooperation and planning between the private and the state sector to share costs, including brand establishment costs, training costs, export-oriented policy formulation, FDI and technology transfer. A national brand for salmon products has opened up markets for individual exporters and expanded the market for all participants.

Source: Nguyen, 2011.

Second, the domestic market does not seem to be adequately exploited. Except for Veg root/tuber prep/pres, Viet Nam is a net importer of the other three champions. In 2009, the import of rubber tyres/treads from Thailand alone was larger than exports to the top five markets added together. Third, looking behind these export figures, we observe that an increasing number of agricultural enterprises in Viet Nam are being awarded international certificates such as GLOBAL G.A.P or FSC. A few Vietnamese firms have also been able to export branded products such as Vinamilk beverages, Phu Quoc fish sauce and Trung Nguyen coffee. These practices demonstrate how Viet Nam could decommodify its resource-based exports and should thus be pursued further.

Thirty-three out of 69 resource-based exports are overachievers. These are products that grow at a slower rate than the resource-based market as a whole but in which Viet Nam is gaining market share, i.e. theoretically, Viet Nam risks oversupplying the market with a product that is not in high demand. In practice, however, as most of its overachievers currently have less than 1 percent global share, Viet Nam can still push for higher growth of these exports, in many of which Viet Nam enjoys a comparative advantage.

The seafood industry

The seafood industry is of great significance for the Vietnamese economy as a whole.[19] Fishery products were also one of the six large industries highlighted by the ITC and VIETRADE as having continued growth potential.[20] Fish/shellfish, prep/pres (SITC 037) was Viet Nam's second largest resource-based export and fell into the overachiever category, and provided the main value addition to the primary sector[21] – export value has increased by a factor of more than 30 to reach US$ 634 million in

19 Exports in 2008 were worth US$ 4.5 billion and provided employment for 5 million workers.

20 Export potential assessment in Viet Nam, Draft version, August 2005 Project VIE/61/94: Support to Trade Promotion and Export Development in the Socialist Republic of Viet Nam Implemented by the International Trade Centre UNCTAD/WTO (ITC) and the Vietnamese Trade Promotion Agency (VIETRADE).

21 US$ 76 million of dried, smoked or salted fish were also exported in 2008.

2009. The ability of this sector to increase exports during a time of global crisis strongly suggests that this sector is highly competitive. What is more, the seafood industry was able to withstand a dramatic drop in demand from the European market. Imports for seafood among the EU-27 dropped 30 percent, with demand from this market only falling 7.5 percent for Viet Nam.

Viet Nam may be able to tap into new and growing markets in the Middle East for this category and exports to Russia have recently resumed as well, but there is undoubtedly a need for further improvement of environmental and disease control systems to raise productivity and reduce the risk for farmers. Improving packaging and processing should allow for higher value products to be developed in both current and new markets. For the fisheries sector as a whole, the role of VASEP is crucial, both in promoting Vietnamese products overseas and in preventing unhealthy competition among export firms.

5.2. Low-tech manufactures

Low-tech manufactures include clothing, textiles, leather and footwear, plastics, glassware, furniture and simple metal products, among others. These products are characterized as labour-intensive and use relatively simple technologies, with research and development (R&D) tending to be low and innovation limited.

For less sophisticated products within this category, competitiveness implies keeping labour costs low and productivity high. These sectors have few barriers to entry and are therefore highly exposed to entry by new competitors. For more sophisticated products in this category (for example, designer clothes or high-end jewellery), competitiveness requires greater technological and human capacity as well as responsiveness to shifts in preferences and market demand.

Globally, low-tech manufactures made up 18 percent of total manufactured trade in 2009, slightly higher than the share in 2000. Although their annual growth rate ranked second amongst the four technological groups, low-tech exports remained the least traded as of 2009. Within this group, apparel and textile products have lost the greatest market share,[22] while steel-based products have achieved the highest gains. Eight steel-based products gained a 6 percent share of low-tech exports from 2000 to 2009, when they accounted for 29 percent of exports in this category.[23]

Our benchmarking countries as a whole have gained market shares in this area. China is obviously the largest low-tech exporter in the group: in 2009, China accounted for 22.8 percent of global trade in this category, up from only 11.8 percent in 2000. This gain in market share is far above that of the countries ranked second and third, namely India and Viet Nam (see Figure 11). In terms of annual growth rates, China ranks second only to Viet Nam, whose low-tech exports increased 20 percent annually during the period 2000 to 2009. Yet given that China's export value in this category is 16 times that of Viet Nam's, an annual growth rate of 15.2 percent is truly remarkable.

Cambodia provides a stark warning of the danger of over-reliance on low-tech manufactures. In 2008, low-tech products accounted for nearly 96 percent of its manufactured exports. Despite local competition, Cambodia has become one of the world's top 20 exporters of garments. The current economic downturn has shown the precariousness of Cambodia's over-reliance on one market and one product group. Between September 2008 and May 2009, 18 percent of the total 352,000 workers in Cambodia's garment industry were laid off and dozens of factories shut down due to fewer purchase orders (Tong, 2009).

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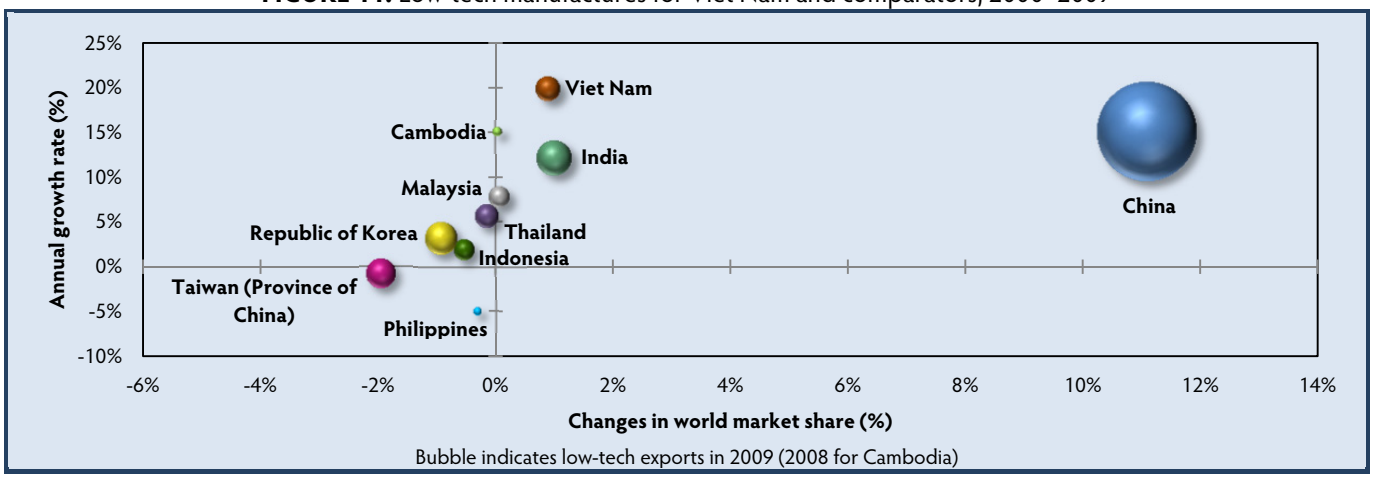
22 841 Men's/boys' clothing woven, 651 Textile yarn, 845 Articles of apparel nes, 842 Women's/girls' clothing woven, 652 Cotton fabrics, woven, 658 Made-up textile articles, 843 Men's/boys' wear knit/crochet, 656 Tulle/lace/embr/trim, 657 Special yarns/fabrics, 655 Knit/crochet fabrics, 654 Woven textile fabric nes, 848 Headgear/non-text clothing, 844 Women's/girls' wear knit/croch, 846 Clothing accessories combined dropped 6 percent in the low-tech export market from 2000 to 2009.

23 676 Iron/steel bars/rods/etc., 679 Iron/steel pipe/tube/etc., 691 Iron/stl/alum structures, 675 Flat rolled alloy steel, 677 Iron/steel railway matl, 699 Base metal manufac nes, 899 Misc manuf articles nes, 674 Rolled plated m-steel.

FIGURE 11. Low-tech manufactures for Viet Nam and comparators, 2000–2009



Source: UN Comtrade.

Analysis

Low-tech manufactures dominated Viet Nam's manufacturing exports with a value of US$ 22.5 billion in 2009. Although Viet Nam has endeavoured to move into more sophisticated exports, low-tech manufactures are likely to continue to be the largest export category for some time to come and will provide the bulk of Viet Nam's employment in manufacturing. The experience of supplying international markets, including the improvement of quality standards, timeliness and process technologies has provided Vietnamese firms with valuable experience that could form the basis of diversification efforts into new products and markets.

Annex C classifies Viet Nam's low-tech exports into the four categories discussed earlier in the report: champion; overachiever; underachiever; and decline. Given that this group contains many of Viet Nam's top manufactured exports, it is understandable that the majority of products fall into the champion and overachiever category. Eight champions, whose export value is above the low-tech average, include furniture/stuff furnishings; articles nes of plastics; footwear; jewellery; trunks and cases; and three apparel products (SITC 658, 843, 844).

China is Viet Nam's biggest competitor among the benchmarking countries in champion products. Except for jewellery, Viet Nam's remaining seven top champions are also China's champions. Taken together, exports of these seven products from China have gained 23.5 percent of world market share during the period 2000 to 2009. The corresponding figure for Viet Nam is only 2.1 percent.

Three points emerge in the context of Viet Nam and China's performance in the former's top five markets for each of the seven champion products (see Table 14).

First, Viet Nam has concentrated its champion exports in markets with high demand. Shares of the top 5 export destinations in global trade ranged from 35 percent to 48 percent in 2009. The usual large markets for these products such as the US, Japan, UK and Germany frequently appear in Viet Nam's top 5 markets, which make up 53 percent to 89 percent of the country's export to all countries.

Second, even with such high concentration, Viet Nam is still a relatively small player in its top 5 markets. The highest market share of Viet Nam's 7 champion products is 8 percent in footwear (SITC 821) and in men's/boys' wear knit/crocheted (843); four out of seven champions held no more than 3 percent market share in 2009. In contrast, China's presence in Viet Nam's top 5 markets is manifest, with the market share in 2009 ranging between 22 percent and 53 percent. Both China's current market share and the amount it has gained during 2000–2009 are considerably higher than Viet Nam's.[24]

Third, Viet Nam's top 5 markets for each of the 7 champions lost global market share during 2000–2009. Since global trade for these products increased during the same period, there must be relatively fast growing demand for these champions elsewhere. Given that Viet Nam is over-concentrating in its top 5 markets where competition is fierce, the country should look more into emerging opportunities in other fast growing markets.

24 Low labour cost is now Viet Nam's comparative advantage over China. In footwear, for example, Viet Nam has recently superseded its giant neighbor to become the biggest production base for Nike shoes.

TABLE 14. Export performance of Viet Nam and China in Viet Nam's 7 low-tech champions, 2000–2009

Product	Country	Export concentration in Viet Nam's top 5 markets[25]	2009 market share in Viet Nam's top 5 markets	Change in market share in Viet Nam's top 5 markets, 2000–2009	Global share of Viet Nam's top 5 markets in 2009	Change in global share of Viet Nam's top 5, 2000–2009
Furniture/stuff furnishing	Viet Nam	73%	3%	3%	48%	-9%
	China	*55%*	*31%*	*22%*		
Articles nes of plastics	Viet Nam	62%	1%	1%	35%	-4%
	China	*51%*	*22%*	*22%*		
Footwear	Viet Nam	56%	8%	4%	38%	-10%
	China	*42%*	*41%*	*12%*		
Made-up textile articles	Viet Nam	53%	2%	1%	40%	-4%
	China	*48%*	*53%*	*26%*		
Women's/girls' wear knit/crochet	Viet Nam	89%	7%	6%	42%	-15%
	China	*37%*	*39%*	*27%*		
Trunks and cases	Viet Nam	64%	3%	2%	40%	-13%
	China	*43%*	*51%*	*21%*		
Men's/boys' wear knit/crochet	Viet Nam	76%	8%	7%	35%	-17%
	China	*25%*	*35%*	*21%*		

Source: UN Comtrade.

BOX 8. 'Thirst' for domestic inputs

Enterprises in Viet Nam's textile and garment sector still have to import much of their inputs. The Industrial Garment Company of Dong Nai (Donamay), for example, imports about US$ 2 million in inputs by value each year from Republic of Korea, China and Taiwan (Province of China), which is equivalent to nearly 50 percent of exports. According to the company's Vice Director, Ms. Nguyen Thi Bich Lien, domestic inputs lack variety and simply do not meet Donamay's requirements. "Certain types of fabric which our foreign clients demand are not available domestically. Those that are available are hard to find and their prices are also not cheaper than imported fabric. Nearly 100 percent of our inputs each year are imported."

Mr. Bui The Kich, General Director of Dong Nai Garment Joint Stock Company (Donagamex), asserts that, "Enterprises face two problems when importing inputs: first, they cannot actively manage time and second, there are costs to quality control. However, the currently available domestic inputs cannot substitute for imports in terms of quality and quantity. To have large orders for domestic inputs is extremely difficult." The cost of imported inputs makes up 40 percent of the price of Donagamex's products each year.

As long as supporting industries for the textile and garment sector remain underdeveloped, Viet Nam's manufacturing enterprises will find it difficult to increase value added.

Source: http://www.dongnai.gov.vn/cong-dan/tin-cong-nghiep/20100802.675/mlobject_print_view

The apparel and textile sectors

Five of Viet Nam's largest ten low-tech export products are items of apparel, together accounting for 36.5 percent of total low-tech exports or US$ 8.4 billion. Sixty percent of these exports by value went to the US in 2008, where imports from Viet Nam have grown 81.1 percent per annum from 2000 to 2008, overtaking Mexico to become the second largest source of American apparel. There are, however, concerns that this market will be very vulnerable to competition from China, especially considering that US safeguard action against China ceased at the end of 2008 with no signs of renewal. Data for 2009 indeed show China gaining market share.

US imports of these five apparel categories fell 12.8 percent from 2008 to 2009, no doubt as a consequence of reduced consumer spending following the financial crisis. While Viet Nam has performed relatively well in this market, with imports only falling 3.6 percent compared to 15.8 percent for Mexico, imports from China actually increased by 0.4 percent. On a more positive note, Viet Nam entered into an Economic Partnership Agreement (EPA) with its second largest apparel export destination,

25 These were Viet Nam's top 5 export markets in 2009, and will differ for different products.

Japan, on 1 October 2009. The elimination of the 10 percent tariff will bring Viet Nam in line with other ASEAN exporters (MOFA, 2009).

The textiles sector's role in the Vietnamese economy goes well beyond foreign exchange earnings. The sector employs between 1.1 million and two million people (IBM Belgium et al., 2009). The MoIT sectoral master plan refers to the role of exports as a 'development objective'.[26] The sector is dominated by former SOEs, and the largest corporate grouping is the economic group VINATEX. Comprising 60 enterprises, VINATEX produces 40 percent of apparel and 60 percent of textiles in Viet Nam. The group consists not only of manufacturers, but also of fashion magazines, fashion design institutes and textile industry vocational schools and universities.[27] It remains 20 percent to 30 percent government owned with a significant proportion of the shares originally allocated to workers in the equitization process now owned by foreign investors.[28]

The industry is primarily engaged in low value added Cut, Make, Trim (CMT) operations, with select investment locations to access cheap labour, and are therefore quick to relocate when wages rise. Exports are often controlled through foreign trading houses, most of which are Taiwanese (Province of China), (Republic of) Korean and Japanese. Viet Nam entered this industry later than regional exporters such as India, Sri Lanka and Bangladesh and, hence, has comparatively weaker labour, technical and management skills. Viet Nam's apparel industry suffers from low productivity levels due to a shortage of skills and obsolete machinery. FDI has been key in upgrading this sector within the region. For instance, Japanese FDI was instrumental in Malaysian automating production as the Japanese sent their old equipment to Malaysia after upgrading their own plants; furthermore, the key to improving productivity in the Malaysian knitting industry was for independent traders to be able to provide machines and training to local producers, increasing productivity 3 to 5-fold (Rasiah, 2009).

That being said, the textiles and apparel sector is one of the currently six large industries highlighted by ITC and VIETRADE as having continued export potential (Vu, 2009). The government has recognized the need to improve human resources in the industry.[29] Surveys in the VCCI's Annual Business Report 2010 also indicate a continuous increase in the ratio of investment in technology upgrading to total investment in the garment sector from 2007 to 2009. In addition, Viet Nam already has a highly-skilled workforce in handmade commodities such as embroidery and a high-quality silk supply which builds on centuries of tradition but mainly serves the tourist and high-end Vietnamese market.[30] Scaling up such an industry has inherent difficulties, but also possesses 'Made in Viet Nam' brand building potential.

Improving the supplier base for the textiles and footwear industries is one of the aims of the SEDP 2011–2015 to meet the demand for materials in a timely manner and at a lower cost. Efforts to achieve this are underway: PVTex's Dinh Vu polyester fibre production plant was expected to start operations in August 2011 and will be able to meet 30 percent to 40 percent of domestic demand.[31] Furthermore, Vinatex is planning to build four industrial parks specializing in textile and dyeing in Ninh Binh, Nam Dinh, Long An and Tra Vinh to encourage investment in the production of input materials for the garment sector and increase the corporation's capacity by 200 million square metres of cloth by 2015.[32]

The furniture sector

Furniture/stuff furnishings (821) is Viet Nam's second largest low-tech export (at the SITC 3-digit level), attaining US$ 2.4 billion in 2009. This sector increased its world market share most rapidly, with an annual average growth rate of 30 percent from 2000 to 2009. This rate was well above the average for the low-tech sector. Viet Nam has a long tradition of furniture making, which is also one of the six large industries highlighted by ITC and VIETRADE as

26 Decision No. 36/2008/Qd-Ttg of 10 March 2008, Approving the Strategy on Development of Viet Nam's Textile and Garment Industry Till 2015 and Orientations to 2020.

27 http://vinatex.com/WebPage/HTML/HTMLForm.aspx?CategoryID=236

28 Thompson Gale Company Profiles accessed through http://www.alacrastore.com/storecontent/bir/440691

29 Decision No. 36/2008/Qd-Ttg of 10 March 2008, Approving the Strategy on Development of Viet Nam's Textile and Garment Industry Till 2015 and Orientations to 2020.

30 Export potential assessment in Viet Nam, draft version, August 2005 Project VIE/61/94: Support to Trade Promotion and Export Development in the Socialist Republic of Viet Nam Implemented by the International Trade Centre UNCTAD/WTO (ITC) and VIETRADE.

31 http://www.pvc.vn/vn/Tin-tuc/tin-tap-doan/Thu-tuong-Nguyen-Tan-Dung-tham-Nha-may-xo-soi-Polyester-Dinh-Vu.aspx

32 http://www.maythangloi.com.vn/?id_pnewsv=377&lg=vn&start=0

having continued export potential (Vu, 2009). Many small scale enterprises as well as larger manufacturers are involved in this sector (VIETRADE, 2005). As is the case in other sectors, a shortage of skilled workers, outdated machinery and lack of skills to deal with international buyers hamper the industry's performance. In addition, the supply of raw materials for wooden furniture has emerged as an important factor. In 2003, Viet Nam imported 80 percent of its raw materials and export bans in major suppliers such as Laos and Cambodia jeopardized imports. Recent research suggests that a decline in demand has resulted in the accumulation of stocks of imported wood (Vu, 2009). More buyers now require products that are certified by the Forestry Stewardship Council (FSC).

Viet Nam's furniture exports to the US rose by an incredible 123 percent per annum from 2000 to 2009, when the value of exports reached US$ 1.1 billion. Viet Nam is now the fourth largest supplier of furniture to the US after China (US$ 10.3 billion), Mexico (US$ 2.9 billion) and Canada (US$ 2.5 billion). Following the outbreak of the financial crisis, US imports of furniture fell by nearly one fifth from 2008 to 2009. Interestingly, imports of furniture from Viet Nam have experienced the lowest decline (4 percent) to the main suppliers in the US, while imports from high end producers in Canada and Italy fell by around a third in the same year.

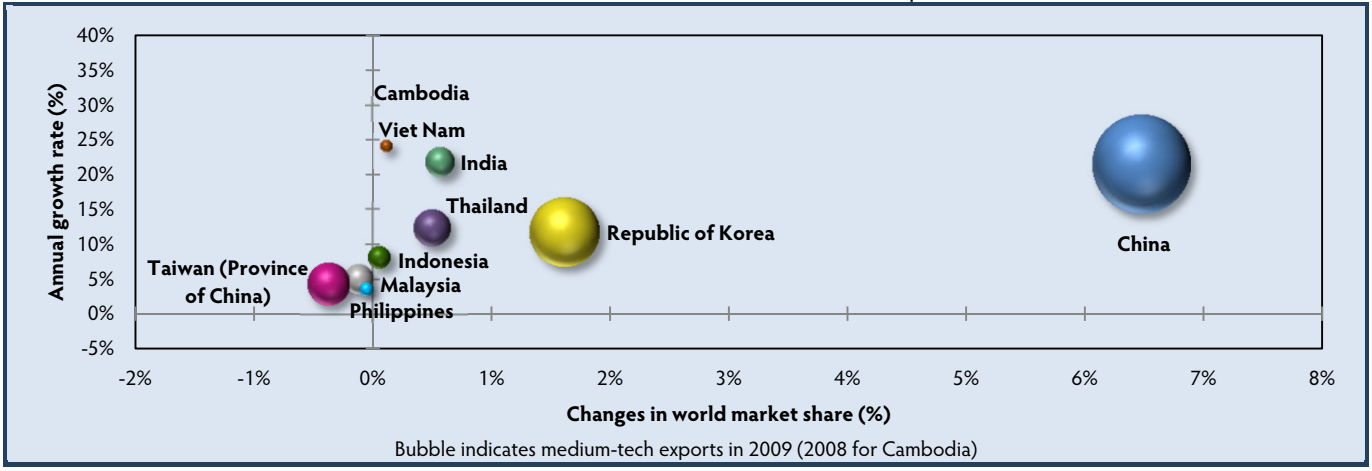
Vietnamese furniture is also estimated to be around 10 percent cheaper than that made in China. Imports from China fell by 12 percent from 2008 to 2009. This likely reflects US consumers' shift to cheaper products as they deleverage in the wake of the financial crisis. This situation will probably not change soon, and Vietnamese firms are likely to benefit. Nevertheless, it is important for producers and exporters to leverage the experience and relationships they are currently building so they can respond quickly and appropriately when consumer demand for higher end products begins to recover.

5.3. Medium-tech manufactures

Medium-tech manufactures (MT) include three lines of goods: automotive products (for example, passenger cars and parts, commercial vehicles, motorcycles and parts); processed products (for example, synthetic fibres, chemicals and paints, manufactured fertilizers, perfumes/cosmetics); and other engineered products (for example, pipes/tubes, industrial machinery, pumps, switchgears, ships/boats, watches).

Competitiveness in these industries requires sophisticated technology and a highly skilled workforce, especially in the development of new products. The barriers to entry into these sectors, which represent the industrial and economic engine of most developed countries, are high and often difficult for developing countries to achieve because it entails a long process of learning, innovation and the continuous improvement of techniques and procedures.

FIGURE 12. Medium-tech manufactures for Viet Nam and comparators, 2000–2009



Source: UN Comtrade.

All of our benchmarking countries recorded an increase in the share of MT exports in total manufactured exports from 2000 to 2009. The largest shares in 2009 were attributed to Republic of Korea (46 percent), Thailand (36 percent) and Taiwan (Province of China) (32 percent). China, Malaysia and Indonesia follow, with figures ranging between 22 percent to 28 percent. Given that Viet Nam relies heavily on low-tech exports, it is not surprising that the country ranks low in terms of MT's share in total manufactured exports.

Figure 12 above illustrates the change in our benchmarking countries' contribution to world market share over the period and the growth of MT exports. China again leads the group, having trebled its market share in MT from 2.9 percent in 2000 to 9.4 percent in 2009. Republic of Korea, Thailand and India have also increased their market share, albeit from a smaller base, to reach 4.7 percent, 1.3 percent and 0.8 percent, respectively, in 2009. In contrast, Taiwan (Province of China), Malaysia and the Philippines are losing their footprint in the world market for MT products. These countries saw their MT exports increase over the period but are losing world market share due to relatively slow growth compared to the global average.

Although Viet Nam's world market share of 0.14 percent is still small compared to other countries' in our group, it enjoyed impressive growth in MT exports at 24 percent per annum during the period, reaching US$ 4.9 billion in 2009. Cambodia recorded the highest growth rate in MT exports of 30 percent per annum; however, its world market share and export capacity are small. The growth rate of MT exports for comparator countries is generally high, for example, 21.5 percent for China and 21.9 percent for India. The figures for Thailand, Republic of Korea and Indonesia lie between 8 percent and 12 percent per annum.

Analysis

Since MT is the fastest growing sector in Viet Nam, it is understandable that the majority of MT products are either champions or overachievers. Of the 73 products, there are 25 overachievers and 42 champions, 11 of which recorded export values above the sector's average in 2009.

Nevertheless, the fact that Viet Nam has numerous champions among MT products does not mean that exports from this sector are competitive. Even with an impressive growth rate during the period 2000 to 2009, all of Viet Nam's MT champions still accounted for less than 1 percent of the world market in 2009. Of these 42 champions, only 'sound/TV recorders' (SITC 763) exceeded 0.5 percent of the global market share during this period.

Furthermore, Viet Nam is a net importer of 37 out of its 42 champions in the MT sector. Eight of the 11 champions have a trade deficit.[33] For example, the trade deficit with China amounted to a combined total of over US$ 5.1 billion in 2009 for medium-tech manufactures.

Viet Nam should be cautious when moving into MT manufactures as this sector is very vulnerable to changes in demand. In 2009, global trade in MT fell by US$ 1.1 trillion from the previous year, equivalent to a drop of 25 percent within merely one year. Viet Nam's MT exports dropped 14.3 percent compared to export value in 2008. This is the largest decrease among the four groups: in the same year, LT exports dropped by only 1.7 percent; RB gained 1.3 percent; and HT rose 15.4 percent in terms of export value amid the financial crisis.

Shipbuilding

The Vietnamese government has identified shipbuilding as a key industry for development due to its strategic location close to important international shipping routes and the vast coastal area of Viet Nam. Shipbuilding in Viet Nam has grown at an average of 88 percent per annum to US$ 410 million in 2008. However, Vinashin, the largest domestic producer of ships, had accumulated a debt of US$ 4 billion as of 2010, primarily due to mismanagement. The government is currently undertaking steps to restructure the company.[34]

33 Equipments/ instruments (industrial heating/cooling equipment, domestic equipment, medical/etc. instruments, plastic sheets/film/etc., taps/cocks/ valves) and chemical products (soaps/cleansers/polishes, misc. chemical prods nes, manufactured fertilizers).

34 Vinashin accounted for over 70 percent of shipbuilding capacity in Viet Nam and its subsidiaries once included shipping companies, finance companies, steel manufacturers, construction companies and supporting industry companies. Despite its achievements in building various types of high quality ships, Vinashin accumulated a total debt of VND 86 trillion (around US$ 4 billion) as of 2010, not least due to its reckless expansion and scattering investments. Currently, the government has taken steps to restructure the corporation, which includes phasing out all unnecessary subsidiaries, restructuring its debts, incorporating a number of Vinashin's subsidiaries into Vinalines and PVN and changing its management body.

Fertilizers

Manufactured fertilizers (SITC 562) are a rapidly growing export globally, increasing at a rate of 13.5 percent per annum from 2000 to 2009. Viet Nam's market share in this growing market has risen by 0.3 percent to reach exports of US$ 108 million in 2009. Cambodia, Malaysia, the Philippines and Thailand account for 77 percent of all exports, but there are also destinations as far away as Angola that imported US$ 2.5 million in fertilizers. Chemical fertilizers are one of the industries included in the SEDP 2011–2015, with a target output of 3 million tonnes in 2011, increasing to 4.1 million tonnes in 2015. Fertilizers are also one of the subsectors in the MoIT chemicals sector strategy document which recommends investment in specific products.[35] There are around 2,000 companies operating in the chemicals sector in Viet Nam, about 80 percent of which are privately owned and around 10 percent are foreign invested. However, the state sector, dominated by Vinachem, produces 60 to 70 percent of the industry's output (IBM Belgium et al., 2009). Vinachem operates across many industry sectors including fertilizers, where its output satisfies around half of domestic demand. Vinachem has recently expanded its production of fertilizers, opening a new plant in Hai Phong in 2009.

Automobiles

The automobile industry in Viet Nam kicked off with joint ventures with Japanese manufacturers in the mid-1990s. Exports of parts (SITC 784) to Japan dominate Viet Nam's automobile industry, accounting for 69 percent of US$ 414 million in 2008. The industry was heavily affected by the 1997 Asian financial crisis and there were a number of plant closures. Output was estimated at only 40 percent of capacity in 2004, though this was an improvement compared to the beginning of the decade. Foreign producers have pledged to increase the local content of manufactures to 40 percent, but this target has not been achieved. It is reported that quality control is an issue, even for simple nuts and bolts, and that import prices for most parts are lower than prices of locally produced goods (Viet Nam Development Forum, 2006).

Motor vehicles are one of Viet Nam's most protected sectors and one which was excluded from tariff reductions under the AFTA. However, the ASEAN Trade in Goods Agreement, which came into effect on 1 January 2010, will require the removal of all tariff barriers by 2015 and will have significant implications for the sector (IBM Belgium et al., 2009).

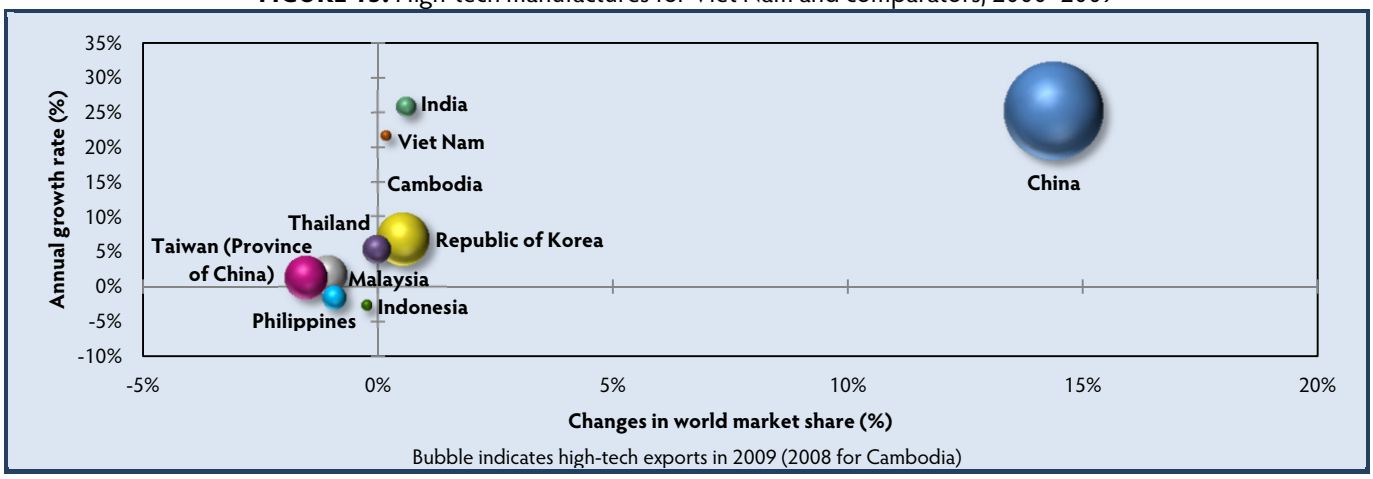
5.4. High-tech manufactures

High-tech manufactures include advanced engineered products (for example, aircraft and precision instruments, electrical power transmission equipment, computers), and advanced processed products (for example, medicaments, radioactive material). Production of these goods requires advanced capabilities and imposes significant risks on investors. However, the assembly end of many high-tech electronic goods does not require the use of skilled labour or processes that call for high levels of technical competence.

Global demand for high-tech products has recorded the slowest growth rate among the four sectors, attaining only 5.6 percent per annum during the period 2000 to 2009. Its share in total manufactured trade shrunk from 25 percent in 2000 to 22 percent in 2009. This is, of course, partly due to the expansion of resource-based manufactures in recent years.

35 'Fertilizers: To make in-depth investment in renewing technologies and equipment of factories manufacturing phosphorous fertilizer, NPK fertilizer and biological organic fertilizer; to develop assorted mixed fertilizers, raising their nutritive contents in service of the domestic and export demands. To concentrate capital on investment in factories manufacturing nitrogenous fertilizer from natural gas and coal, a number of factories manufacturing NPK with advanced technologies, and DAP manufacturing factories. To make use of assorted wastes for the production of biological organic fertilizer, contributing to minimizing environmental pollution; to take initiative in importing assorted useful microorganisms for the production of biological organic fertilizer and microbiological fertilizer to meet the use demands.' Decision No. 207/2005/Qd-Ttg of 18 August 2005, Approving the Strategy on Development of Viet Nam's Chemical Industry to The Year 2010 (With a Vision to the Year 2020 Taken Into Account).

FIGURE 13. High-tech manufactures for Viet Nam and comparators, 2000–2009



Source: UN Comtrade.

The largest four high-tech products account for over half of total exports and sector growth during the period 2000 to 2009. However, medicaments including veterinary (SITC 542) has recorded a continuous rise in exports and a respectable growth rate of 17 percent per annum to reach US$ 303 million in 2009. The export performance of the others has been slower and less stable. Valves and transistors (776) grew at 2 percent per annum, while the figures for telecom and computer equipment were 5 and 3 percent, respectively.

Four out of the 10 benchmarking countries have been able to gain world market share in the high-tech sector, namely China, Republic of Korea, India and Viet Nam. As expected, China is the all round best performer, gaining nearly 15 percent world market share to account for 18 percent global trade in high-tech products. This sector also had the fastest growth rate from 2000 to 2009 and gained the greatest share in China's total manufactured trade (around 11 percent). China is making tremendous headway in high-tech industries. India has also performed well in this sector, with an average growth rate of 26 percent per annum, mostly from SITC 542 medicaments including veterinary. Interestingly, Viet Nam is one of the three benchmarking countries that was able to increase high-tech exports from 2008 to 2009. This increase came mostly from the export of photographic and telecoms equipment (see Figure 13).

Another country that gained world market share, Republic of Korea, actually lost market share in the majority of its high-tech exports, but its growth in telecoms equipment means it gained market share in the sector as a whole. It is the only country to compete with China in this product group with a growth in market share of 6.1 percent since 2000, compared to 1.2 percent for India, the only other country whose market share increased since 2000 to over 1 percent in 2009.

Analysis

Viet Nam's world market share for high-tech exports has increased from only 0.06 percent in 2000 to 0.22 percent in 2009. Although both the absolute value of the market share and the magnitude of the increase are quite small, the figures are still encouraging. A positive aspect of recent developments is the increase in FDI in Viet Nam to produce high-tech exports.[36] The share of this sector in total manufactured exports from Viet Nam fluctuated over the period 2000 to 2009, starting at 11.1 percent in 2000, then dropping to 10.4 percent in 2008 and increasing to 12.2 percent in 2009. The sector achieved US$ 593 million in exports during the financial crisis, while exports of low-tech and medium-tech products fell by US$ 379 million and US$ 814 million, respectively.

Annex E classifies Viet Nam's high-tech exports into the four categories champion, overachiever, underachiever and decline. As is the case for medium-tech products, the majority of high-tech exports are champions, meaning the country is gaining world market share in fast growing high-tech manufactures. Of the total 17 products, there are four overachievers and nine champions, three of which have export values above the sector's average in 2009. Viet Nam's total export of its top ten products was worth US$ 4.38 billion in 2009, 98.7 percent of its total

36 Further FDI data analysis may be needed to shed more light on this issue.

high-tech exports. Half of these are champions, accounting for exports of US$ 2.1 billion in 2009 or 48 percent of Viet Nam's total high-tech exports, up from 12.6 percent in 2000. Viet Nam's exports of these five products have grown at a staggering 41 percent compared to the global export growth rate of only 11.6 percent per annum from 2000 to 2009.

The destination of high-tech exports changed considerably over the period. In 2000, the Philippines and Thailand were the major destinations, accounting for 37.3 percent and 19.7 percent of trade, respectively. High-tech exports to the Philippines actually halved to US$ 144 million from 2000 to 2008, and now account for only 3.3 percent of exports. Exports of office equipment parts fell from US$ 271 million in 2000 to US$ 99 million in 2009 in line with the Philippines' decline in exports of both this product group and of office machines. Malaysia, the fourth largest export market with a share of 10 percent in 2000, fell to fifteenth place with a share of only 1.3 percent in 2009. China's importance has, unsurprisingly, grown and accounted for 8.5 percent of exports in 2009. However, the largest shift has been to US and European markets, with the former now being the second largest export market for Vietnamese high-tech products.

Power generation

Rotating electric plant and electric power transmission equipment (SITC 716 & 771), worth US$ 491 million and US$ 300 million in 2009, respectively, are both part of the strategically important power generating machinery and equipment industry. Power generation is of considerable significance for the Vietnamese economy, as the country struggles to keep pace with demand which is forecast to rise between 17 percent and 20 percent from 2006 to 2015.[37] Currently, a great deal of equipment, especially of lower capacity, is sourced from China, and MoIT's Industrial Strategy and Policy Research Institute has rated this sector as having low competitive potential. Only 19 percent of the workforce has any training and 19 percent has university qualifications.

Both categories have, on average, grown by around 30 percent per annum for the period 2000 to 2009. Japan has been a major export market, accounting for nearly 50 percent of the growth in electric power transmission equipment. Exports rose from US$ 18 million in 2000 to US$ 140 million in 2009, which represents 47 percent of total exports in that year. It is also the second largest export destination in the rotating electrical plant category, worth US$ 56 million in 2009. However, growth in this category has mainly been driven by exports to the US; there was a marked jump in exports in 2002 following the signing of the BTA. Over the period 2000 to 2009, exports grew 65 percent per annum to reach US$ 99 million in 2009.

Office machines

The largest and fastest growing product in this category, office machines (SITC 751), was worth US$ 1.2 billion in exports in 2009, having grown an average of 186 percent per annum from 2001 to 2009. However, virtually all of this growth occurred after 2007, when exports were only US$ 701 million. Prior to this, Viet Nam's only regular exports had been to Japan, but in 2008, exports suddenly boomed and exports of over US$ 10 million were supplied to over 20 countries. Nearly half of the exports went to the US, the Netherlands and China. This dramatic rise is almost entirely attributable to the opening of Canon's three facilities in Thang Long industrial park (Hanoi), Tien Son industrial park (Bac Ninh) and Que Vo industrial park (Bac Ninh). The Que Vo facility is also the largest laser printer factory in the world and has a capacity of 14.4 million units per annum. The DANIDA enterprise survey asserts that FDI is of vital significance to these exports. All enterprises exporting office machines from Viet Nam are foreign invested operations.

There is ongoing concern about the limited spillover effects from MNCs like Canon to Vietnamese firms. The Que Vo laser printer facility, for example, only uses parts and accessories supplied by satellite FIEs from Canon's own production network in Asia. These satellite companies have, in turn, formed their own laser printer production group with no participation from domestic firms. The Vietnamese case demonstrates that technological spillovers from FDI firms do not materialize spontaneously and that policymakers must find innovative ways to increase the flow of technological capabilities to domestic firms (Nguyen, 2009).

37 Master Development Plan 6, 18 July 2007.

BOX 9. Viet Nam's electronic parts suppliers: Nowhere to be found

The majority of Japanese enterprises in recent years have not been able to find qualified electronic parts suppliers in Viet Nam. Many enterprises have resorted to the yellow pages and even their employees' personal relations to search for suppliers. Several agencies such as the Viet Nam Chamber of Commerce and Industry (VCCI) have established a database to collect information from companies.

However, such lists of thousands of enterprises do not provide much help for investors. There are cases in which one Japanese enterprise had to contact hundreds of Vietnamese suppliers to find just one firm that met its requirements. Such cases certainly increase costs in terms of time and money.

From the perspective of Vietnamese suppliers, Japanese enterprises are too demanding in terms of product quality, which discourages domestic parts suppliers. Vietnamese suppliers often have to send out numerous samples, and if they are fortunate enough, the first order from a Japanese enterprise will be made two or three years later.

Source: http://vietbao.vn/Kinh-te/Dot-duoc-tim-nha-cung-cap-linh-kien-Viet-Nam/20661707/87/

Computer equipment

In contrast to office machines, Viet Nam's computer equipment category (SITC 752) saw exports plummet in 2008 from US$ 945 million in 2007 to US$ 170 million, a drop of 82 percent. This dramatic decrease was attributable to both external and internal factors. Externally, Viet Nam's export of this category of products was hit by the financial crisis: global demand for computer equipment dropped by US$ 400 million in 2008. Exports from Viet Nam to established markets – the US, Singapore, the EU – fell by 96, 93 and 94 percent, respectively, within just one year. Nevertheless, exports from China in the same year increased by 9 percent, from US$ 112 billion in 2007 to US$ 122 billion in 2008. Exports to the US also rose by 4 percent. Thus, the dramatic fall in exports of computer equipment from Viet Nam was not entirely attributable to external factors; rather, internal problems such as undeveloped supporting industries for the electronics sector must also be taken into account.

Though exports in this category are dominated by FIEs, the majority of enterprises are limited to assembly and are dependent on imported parts. During the period 2001 to 2009, imports of computer parts and accessories increased 12 percent per annum on average, from US$ 130 million in 2001 to US$ 373 million in 2009. Computers assembled in Viet Nam cannot compete in terms of price with those from China or other ASEAN countries due to the failure to increase local content and tariffs on imported components.[38] In the current context of undeveloped supporting industries, if tariffs on computer parts/accessories are not reduced soon, it is very likely that FIEs will move their assembly operations to other countries to lower costs, while domestic firms will struggle to remain in operation.[39]

38 Currently, Viet Nam is considering the reduction of tariffs on imported electronic products between 0 percent to 5 percent by 2013, and to 0 percent by 2015 to thus be in line with the CEFT/AFTA roadmap.

39 A difficulty in lowering tariffs on imported parts and accessories is the conflicting interests of domestic firms. While assembly firms want such tariffs to be low, firms that produce parts/accessories demand higher tariff levels.

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Section D:

POLICY RECOMMENDATIONS

6. Policy recommendations

This report highlights that manufacturing growth has been at the core of Viet Nam's impressive economic performance over the last 20 years, and that manufacturing must continue to play a major role in the future if Viet Nam is to sustain high growth rates.

The benchmarking of Viet Nam's industrial performance in Section B revealed impressive growth rates in manufactured exports, but limited benefits due to a simultaneous increase in manufactured imports. Exports of manufactures from Viet Nam grew at 21 percent over the period 2000–2009 – increased trade liberalization and integration into global markets have driven much of this growth – while imports have increased in line with exports at 19 percent per annum.

Viet Nam's MVA grew substantially between 2000 and 2009, achieving double-digit growth in the first and second halves of the decade – though it is important to note that this is based on a low initial value for MVA. The real challenges Viet Nam faces in this regard will be to continue this growth as absolute values increase, and secondly, to expand industry towards more sophisticated industries.

The share of manufactured exports in total exports has remained among the lowest in the region – although the share is increasing. Trade liberalization has failed to trigger a change in Viet Nam's manufactured export pattern, and there is a significant trade deficit in medium- and high-tech manufactures – peaking at US$ 25 billion in 2009. This trend is unlikely to be reversed as living standards continue to rise, thus creating a further imperative for structural change.

The findings of the report suggest that trade liberalization in Viet Nam has been one of the driving forces of economic growth, but not a sufficient factor in triggering structural change. Industrial diversification calls for specific industrial policies that nurture private entrepreneurship and the development of new manufacturing activities. The Vietnamese experience is no exception, as many other countries have faced a similar pattern. There is growing evidence that the benefits of trade liberalization can be maximized when it is selective and gradual, and when a certain industrial maturity exists. In fact, wholesale and sweeping liberalization in countries with weak emerging sectors can have undesirable effects on the industrialization process. Box 10 gives evidence of the link between trade liberalization, industrialization and growth.

BOX 10. Evidence of the link between trade liberalization, structural change and industrialization

An UNCTAD study of 46 countries shows that trade liberalization has not always had the desirable impact on industrialization and structural change. According to a report, 'Forty per cent of the sample countries experienced rapid expansion of exports of manufactured goods. In a minority of these countries, mostly East Asian, rapid export growth was also accompanied with fast expansion of industrial supply capacity and upgrading. By contrast, the experience of the majority of the sample countries, mostly in Africa and Latin America, has not been satisfactory. In fact, half of the sample, most of them low income countries, have faced de-industrialization. Even in some cases where manufactured exports grew extremely fast, e.g. Mexico, MVA did not accelerate and upgrading of the industrial base did not take place. Slow growth of exports and deindustrialization has also been accompanied by increased vulnerability of the economy, particularly the manufacturing sector, to external factors particularly as far as reliance on imports are concerned' (Shafaeddin, 2005).

Interestingly, the study points out that the success in East Asia was attributable to the fact that trade liberalization not only occurred gradually and selectively as part of a long-term industrial policy, but also because countries had reached a certain level of industrial maturity and development. The report warns that across-the-board liberalization can lead to the destruction of existing industries, particularly of those that are in the infancy stage, without necessarily leading to the emergence of new ones.

Another study conducted in Latin America concludes that trade liberalization has short- and long-term effects, and that countries which do not have a strong industrial base are expected to miss out on the long-run effects (Dijkstra, 1997). The author of the study argues that it is therefore important for countries to establish an industrial base to which internal and external economies apply and in which learning effects play a role. This calls for industrial policies that complement trade liberalization policies.

Source: Shafaeddin, 2005; Dijkstra, 1997.

Based on the analysis of sector level performance in Section C, several key challenges emerge. Despite strong growth in the export of resource-based manufactures, the domestic market remains underexploited, with net imports recorded for most of Viet Nam's champion products. The low-tech sector dominates Vietnamese manufactures, accounting for some 65 percent of the total – in contrast to 18 percent globally. This group is more susceptible to increased competition – especially from China – and value addition is quite low. Despite this, there is continued growth potential within this sector, although Viet Nam should aim to leverage these experiences towards more sophisticated manufacturing. Medium- and high-tech manufactures recorded average growth rates of 24 percent and 5.6 percent, respectively, over the period. However, medium-tech manufactures continue to record a net trade deficit while high-tech exports have fallen from 25 percent to 22 percent.

A new strategy is needed to promote structural change. This report calls for a new industrial policy that focuses on industrial transformation in strategic sectors that can support sustained growth and reap the benefits of technological change, innovation and learning. While all manufacturing sectors are important, this report argues that a shift towards technology intensive sectors is necessary to promote industrial deepening and value addition.

To achieve this, the report presents five key policy areas for government action:

- Reformulation of industrial policies and strategies;
- Industrial diversification into high value added products;
- Human resource development for manufacturing;
- Technology development;
- Targeting quality FDI for manufacturing.

The five policy areas are interrelated and mutually reinforcing. The criteria for the prioritization of five policy areas respond to a combination of two sources: a) best practice policies designed and successfully implemented by other countries to achieve industrial transformation; and b) comprehensive consultation with national and international experts on the key elements to be tackled by the Government of Viet Nam.

As stressed throughout the report, industrial development is a slow-gestating, path-dependant process. It is therefore worth noting that the benefits of good policy may not be fully realized within one decade. A strong, organized and coherent industrial strategy and investment in technical training are important foundations for structural change. However, there will be a time lag between the implementation of a new human-resource development policy and the entry of the first cohort of trained workers into the labour force. Improved promotion of investment is an essential component of industrial growth; however, the increase in skill levels will play an important role in attracting new investors. In a similar vein, technology policy can help Viet Nam capitalize on market opportunities and continually update and improve training programmes. The point should be reiterated that the process of transition towards more sophisticated manufacturing involves a significant time lag.

6.1. Reformulation of industrial strategies and policies

The Government of Viet Nam has undertaken considerable efforts to internationalize the economy by entering into trade agreements with various global partners. This report confirms that these efforts are paying off. Viet Nam's manufactured trade performance has been impressive over the last decade. However, many now question whether trade liberalization has triggered industrial dynamism and value addition at the firm level. Evidence shows that the Vietnamese industrial sector continues to struggle to compete in international markets. For example, the country has been unable to penetrate markets for high value added products and despite rapid growth of exports, still posts a huge annual trade deficit. This calls for the government to review its industrial strategies and policies to take national priorities and global threats and opportunities into account.

With the approval of the Socio-Economic Development Plan (SEDP) 2011 to 2015 with a view to 2020, and the ongoing debate on the role of Viet Nam's eight Economic Groups, there is considerable opportunity to strengthen Viet Nam's strategic goals through a further examination of Viet Nam's industrial experience as detailed in this report.

There are many ways to formulate industrial strategy. The final choice depends on the country's level of industrial development, its trade situation, resource base, level of development of markets and institutions, structure of ownership (public, private and foreign) and the ability of the government to mount industrial policy. It is impossible to generalize about an 'optimal' strategy, as each economy and government must put forward its own ideal set of policies in line with its specific economic, political and social circumstances.

There are different interpretations of what constitutes an appropriate industrial strategy, depending on one's views about the role of markets and governments. To simplify, two main approaches exist: neoliberal and structuralist. The neoliberal approach favours the removal of government from resource allocation, prudent economic management, rapid and sweeping exposure to world markets and non-selective policies to improve skills, institutions and infrastructure (without favouring specific industries or enterprises). It also advocates the privatization of state-owned enterprises and reliance on the private sector to drive development. Underlying this is a strong belief in the efficiency of markets (an absence of significant market failures) and strong scepticism about the ability of any government to intervene efficiently in resource allocation. This approach receives strong backing from the new international rules of trade, investment and finance as propagated by the WTO, World Bank, IMF and major industrialized countries.

The structuralist approach is more favourably disposed towards a proactive role for the government. It accepts the need for sound macro management, greater openness to trade, technology and investment flows, and more stable and transparent rules of the game. However, given widespread market and institutional failures, it is argued that the government must play an important and selective role in resource allocation. Privatization is not taken as a panacea for problems in the public sector, but the reform and upgrading of public enterprises is considered fundamental. The basic difference between the neoliberal and structural approach is that structuralists consider it feasible for governments to intervene efficiently and selectively in the promotion of new activities, in attracting FDI or managing the exposure of existing activities in world markets. The structuralist approach recognizes the new realities of global trade and TNC production systems and assigns priority to the integration of local industries with global value chains, but in a way that promotes sustained growth and upgrading (rather than passive specialization at the low end of the technological ladder). It does not advocate a return to the isolationist strategies of import substitution with interventions unrelated to international competitiveness, but seeks to build competitive capabilities. Finally, it recognizes the real risk of policy failure: hence, improving government capabilities to intervene flexibly and selectively is an integral part of industrial strategy.

Given the challenges the industrial sector in Viet Nam faces, this report favours the structuralist approach to industrial policy. It advocates that trade liberalization in Viet Nam should be achieved through a strategic and controlled approach to both strengthen existing capabilities and develop new ones. It argues for strategic targeting of FDI and global value chains to extract the maximum benefits for production, exports and employment. The government should play an active role in this process and learn from role models in the region.

Mounting an industrial strategy is a very demanding task for any government. It calls for a coherent vision of national development and for consistent inter-agency coordination. It also calls for substantial analytical skills. Many initiatives require building consensus among the major stakeholders (enterprises, employees, ministries and institutions). The Vietnamese government has to pay close attention to all these factors if it aims to devise and effectively implement industrial strategies. It must overcome traditional ministerial divisions that can prevent coherent action. It must develop new in-house analytical capabilities and coordinate policies with the private sector. It must continually monitor policies and modify and adapt them to new circumstances. In other words, the government must build a 'learning and adaptive' policy structure to replace the traditional rigid, rule-bound and top-down apparatus of government.

The Government of Viet Nam needs to initiate and lead an industrial policy debate which takes account of all factors described above. To support the process, this report proposes the following policy recommendations:

- Set up dialogue forums for all stakeholders to discuss key areas of industrial policy in Viet Nam, strategic objectives, the role of government and the private sector, and the institutional architecture required for successful implementation;
- Formulate an industrial law to represent the legal foundation for subsequent laws that relate to industrial development in Viet Nam. Box 11 presents international best practice on the components of industrial law and the requisites for its success;
- Set up a consultative mechanism with enterprises (private and public) and government agencies to discuss drafts of industrial master plans. The purpose is not only to address the technical content of the plan, but also to state and approve the responsibility of ministries and departments at the national and local levels;

BOX 11. Formulating an industrial law: Components and requirements

An industrial policy encompasses laws and regulations that represent the legal foundation for its successful implementation. The regulatory framework for industrial policy consists of a group of laws that support and guide implementers in achieving the strategic industrial path the country has chosen. For our purpose, this group of laws is called industrial law.

The number and content of these laws depend on the country's industrialization model. Some examples of laws which industrial law encompasses include:

- Public companies law;
- Competition-antimonopoly law;
- Quality system law;
- Special economic regimes law;
- Foreign trade and investment law;
- Intellectual property law;
- National system of public sector procurement law;
- Environmental management law;
- SME law;
- Defence of the artisan law;
- Education and training law;
- Technology innovation law;
- Labour law.

International evidence shows that solid institutional architecture and coordination mechanisms are key for identifying the laws and institutions responsible for implementation, which need to be involved in the configuration of this legal framework.

Part of the success of an industrial policy often depends on the presence of high-level political support. Leadership is a must so that the policy agenda and the laws required for its implementation can be pushed through and agreed on with high-level government officials. A leader must propose the institutional arrangements (i.e. the institutions involved) and the formulation and/or modification of laws (i.e. legal framework). The commitment of the main authority of the participating institutions is also a basic requirement.

The establishment of a Coordination and Deliberation Council has proved to be a successful platform to involve the stakeholders and to legitimate the process of devising industrial law. These councils are usually private-public bodies in which representatives coordinate and discuss issues related to the industrial development of the given country, including the identification of laws and regulations that support the industrialization process. Usually, a specific law is required for each strategic area of intervention, which needs to be reinforced in order to achieve a competitive industrial sector. The areas are determined by the Council within the framework of the national development agenda and the economic development model.

It is important to note that in some cases, this Council can identify the need to create a new institution that will be responsible for the development and monitoring of a new law.

The Deliberation Council, represented by the public and private sector, identifies the institutions that have the mandate to review existing laws, to formulate new ones and to create linkages and networks among them to facilitate the development of the legal framework to support the industrial sector.

Source: Rodrik, 2004.

- Establish a dedicated inter-ministerial industrial competitiveness unit or council to assess and monitor industrial performance at the macro and sector levels nationally and internationally. This unit should provide all stakeholders with industrial intelligence and generate baselines for monitoring and future impact assessment;
- Conduct a study to identify skill gaps at the government level for the reformulation and implementation of industrial policy. The study should provide recommendations for the improvement of civil servants' skills in two main areas: a) analytical skills in government think tanks in charge of knowledge generation; and b) managerial skills in government agencies responsible for the implementation of projects and programmes;
- Elaborate an action plan on the institutional and coordination mechanisms for industrial strategy implementation. Based on lessons learned from industrialized countries, some agencies will play a fundamental role:
    - The Vietnamese Investment Agency should assume a greater level of autonomy to negotiate with potential investors and devise individually tailored benefit packages for investment, and negotiate links with domestic industry;
    - An independent body to design and supervise technical training can contribute significantly to building human capital. This body should regularly and rigorously review the training programme, promote links to industry through sponsored apprenticeships or lecturer contract placements. This body would also be involved in promoting technical career paths within the schooling system;
    - Viet Nam's research centres, coordinated by the Ministry of Science and Technology, can play a key role in accelerating Viet Nam's process of technological development. Research is already being targeted towards technology for industry and the development of R&D links to industry, and further strengthening these links and tailoring research for industry will be particularly important;
    - The Ministry of Industry and Trade should play a substantial role in coordinating these efforts and develop a strategic plan to guide stakeholders' actions;
- Devise specific policy packages for SMEs and state-owned enterprises. For SMEs, the focus should be on the provision of facilities for the acquisition of industrial land (through subsidies and low tax rates); start-ups (through, for instance, business incubators and subsidized training); and capital by setting up a special fund similar to that of Japan, Republic of Korea, Taiwan (Province of China) and Thailand. For SoEs, the focus should be on accelerating the process of equitization to promote the development of the private enterprise sector while reducing the bureaucratic administrative management of state agencies.

6.2. Industrial diversification into high value added products

The findings of the report reveal that Viet Nam is vulnerable to third country competition due to its concentration on a few labour-intensive manufacturing sectors. Sustaining growth rates in manufactured trade and MVA requires Viet Nam to enter into new high value added manufacturing activities.

As discussed in Section B, more sophisticated production is likely to be an important factor if Viet Nam is to maintain its impressive growth rates of the last decade. Criticism of the country's over-reliance on imports for export manufacturing suggests that current growth trends may become unsustainable. This indeed supports the call for industrial diversification. Although factor endowments may condition a country's production structure, policy can be strategically used to build competences in sectors without a comparative advantage. Thus, a labour-intensive, low capital country such as Viet Nam does not necessarily have to be seen as being limited by nature to low skills production.

This report recognizes that the enactment of the High-Tech Law, to be led by the Ministry of Science and Technology, demonstrates the government's commitment to diversify into technology intensive activities. While the industrial sectors have generally been identified, namely information technology, biotechnology, new materials technology and automation technology, the Government of Viet Nam needs support in the identification of specific strategic products.

Thus, a key step prior to implementing human resource development or technology strategies is the identification and targeting of key industries for industrial diversification – taking the dynamism of international markets, existing skill pools, technology, existing infrastructure and regional competition into consideration. The selection of key industries can guide the development of human capital training policies, investment promotion strategies and technology research programmes.

Industrial policy in Viet Nam should build on sub-sectoral priorities. This involves three sets of strategic priorities:

- Upgrade existing activities that can become competitive fairly quickly at a reasonable cost and ensure that they are able to sustain their competitiveness over time;
- Gradually move out of activities that are no longer competitive and have few prospects of competing in the foreseeable future;
- Promote new activities with strong potential for growth, employment and technology upgrading.

The analysis of Section C provides insights on the potential sectors that fall under each strategic category above. However, this is not conclusive as the categorization relies entirely on export data. A more conclusive analysis calls for an assessment of the sectors' domestic demand prospects and industrial capabilities. Other recommendations on sectoral priorities for industrial diversification include:

- Definition of policies to execute Decision Number 842/QD-TTg dated 1/6/2011 by the Prime Minister on the "Development plan on several high-tech industries". This decision appoints the Ministry of Industry and Trade as the main implementing agency in coordination with the Ministry of Science, Technology and other related ministries, the People's Committee of Provinces and cities under the management of the central government;
- Definition of policies for the development of key industries, based on clear criteria rather than trade, combining growth potential with sustainability;
- Definition of policies to develop supporting industries, in particular, strategic sectors including automotive, motorcycle, industrial electronics, consumer electronics, shipbuilding, textiles and footwear.

6.3. Human resource development for manufacturing

The role of skill formation in industrial competitiveness is so basic and widely accepted that it does not require much analysis here. What is worth noting, however, is that with the growing pace of technological change, the spread of information technologies and intensification of global competition, the need for skill development has become more pressing. More importantly, the patterns of skills required to compete in modern manufacturing have changed, as have the tools and institutional structures suitable for skill formation. Traditional methods of education and training often prove inadequate, even in developed countries. In the traditional setting, industrial development only entailed improving the quantity and quality of primary schooling and basic technical skills, and encouraging all forms of in-firm training. In the emerging competitive setting, greater emphasis has to be placed on high-level, specialized training, with close interaction between education and industry to assess and communicate evolving needs.

Basic skills have taken Viet Nam a long way on its path to industrialization. However, if Viet Nam is to move up the technology ladder and ensure higher value added, the skills competencies in specialized technical areas need to be strengthened.

Viet Nam's current educational and vocational training system does not produce an adequate level of skills for its workforce. Many firms are forced to retrain workers at high costs so they are able to work in those firms. This reduces Viet Nam's

competitiveness and makes Viet Nam less attractive for medium- and high-technology manufacturers looking for lower cost producing countries or alternatives to their Chinese production bases. A lack of skilled workers and managers holds back domestic firms and lowers Viet Nam's overall productivity level, especially compared to China.

Investment in human capital is closely associated with creating a more attractive destination for foreign investment and increasing domestic productivity (Baldacci et al., 2008; Contractor & Mudami, 2008). The existence of a skilled workforce reduces the need for training and ensures a high quality of production for investing companies and individuals.

Interestingly, investment in education is found to have a substantial effect on export growth, though the effects of increased literacy are very marginal (Contractor & Mudami, 2008). This finding is somewhat intuitive and highlights the significance of investment not only in education, but in higher level education and technical training – especially geared towards industry demands.

In addition to technical skills, "technology management skills" are considered an important area for improving Viet Nam's skills set (Laosirihongthong & Lim, 2008). The lack of technical experience at the managerial level is suggested to deter potential investors. This is being addressed by some universities such as VNU (University of Social Sciences, University of Economics) and the National Economic University (NEU) that offer a Master's degree programme in technology management.

Currently, Viet Nam is characterized by a weak collaboration between government institutions, government bodies and private institutions in guiding and shaping the formation of curricula to respond to industry demands (Laosirihongthong & Lim, 2008; Bekkers & Freitas, 2008). There is, however, a number of limited success stories in which technical training has been tailored to industry needs. A number of vocational and technical training centres have been identified as successfully developing technical skills: Cao Thang Vocational College, Viet Nam Germany Centre, Viet Nam Singapore Centre and Viet Nam Japan Centre. These schools are also involved in industrial consulting work which facilitates knowledge transfer from industry back to the academic sphere. Box 12 provides an example of technical training for industrial development based on the experiences of Singapore.

Based on the above facts, key policy recommendations to boost Viet Nam's human resources for manufacturing are as follows:

- Elaborate a study to benchmark Viet Nam's education and training system against major competitors in terms of quantity, quality, relevance and cost effectiveness, and identify areas of improvement. Viet Nam should use regional benchmarks such us China, Republic of Korea, Taiwan (Province of China) and Singapore;
- Conduct regular skills audits, particularly in vocational training, once the new measures have been introduced;
- Encourage enterprise training using several measures, including subsidized training expenditures and tax exemptions or charge a levy to refund it later;
- Develop a programme to link vocational training institutions with industry, setting up training centres in industrial parks, high-tech parks and export processing zones. A successful university-industry link would require the following:
    - A longer-term vision and a more strategic approach to replace the current short-term objectives of simply earning fees in order to benefit the academic system;
    - To overcome the separation of research from teaching in the university system, more autonomy and incentive systems to encourage innovative research are necessary;
    - Investment should be more focused to avoid wasting resources and fragmentation;
    - Modern university and R&D management practices such as peer review, advisory committees and performance-based evaluations should be thoroughly applied.

BOX 12. Best practice for human capital development: Vocational and technical education in Singapore

Singapore gained independence in 1965 and had very few natural resources. The education and training systems of the country were, therefore, a high priority. Today, Singapore is a high-tech, globalized city state.

In the early days of independence, the government faced high unemployment and realized that the traditional trading and services industries would be insufficient to provide employment for the growing population. A strategic plan to accelerate growth through industrialization was introduced. In the 1960s and 70s, the primary and secondary education systems were expanded and included technical education and training to provide basic technical skills. Technical drawing, metalwork, woodwork and basic electricity became compulsory subjects for all students in secondary school. Vocational schools and streams were phased out of the secondary system and replaced with vocational institutes. Apprenticeship schemes were transferred from the Ministry of Labour, and between 1968 and 1970, the number of graduates increased from 324 to over 4,000.

At this early stage, the Industrial Training Board was developed to coordinate the upscaling of VTE. A training advisory committee was also established with nationwide support to supervise rigorous curriculum development. Traineeships were negotiated with key industries, for example, aircraft maintenance, ship manufacturing and printing. Finally, MOUs were signed with industry for technology and knowledge transfer between education centres and industry to help keep teachers abreast of current developments in industry.

In the 1980s, greater emphasis was placed on improving the skills and quality of education at secondary schools, universities and polytechnics. A comprehensive adult training system was established and minimum schooling for all pupils was increased to 10 years. A new post-secondary education path was also introduced, the ITE. The Institute of Technical Education provided training possibilities for post-secondary students, separate from university and polytechnic training. The number of polytechnic institutes also increased over this period.

Industrial development in Singapore was driven by labour-intensive industry during the 1960s, by capital-intensive investment during the 1980s and 1990s and, finally, by innovation and the high-tech industry in the 2000s. The transition between low-tech, medium-tech and high-tech was facilitated by the existence of a suitably skilled population to meet industrial demands. An important factor in achieving this was the ability of VTE to continually adapt in response to skills and manpower demands, ensuring that graduates had the necessary skills for the new jobs being created.

Source: Law, 2008.

It is important to note that balancing the potentially conflicting interests of commercialized research, teaching and serving the public need is not an easy task. Universities could pursue the establishment of companies to act as commercial arms or technology transfer offices (TTOs) and technology licensing offices (TLOs). Internationalization of the academic system (through the introduction of new practices such as more international staff, international salary levels and modes of management, evaluation criteria and teaching quality, etc.) could create a drive for more competition and improved quality. In terms of promoting linkages between academic institutions and firms, attention should be paid both to the extent of the linkages and mechanisms, which affects quantitative linkages, as well as to their depth.

6.4. Technology development

Technological activity in developing countries consists less of R&D for innovation than of diffuse engineering and technical work for learning, adaptation and improvement. Given its nature, such activity is difficult to measure, though we know that its intensity and effectiveness determine industrial competitiveness and growth. With the use of more complex technologies, R&D becomes necessary to absorb these and adapt them to local conditions.

The main determinants of technological effort are skills, finance for innovation, incentives for R&D and the quality and relevance of the technology infrastructure. No funding for innovation is available in Viet Nam. The government does not offer R&D incentives or support to private enterprises for the import of technology. The technology infrastructure institutions are weak and do not cover all major industrial sectors; the ones that exist contribute relatively little to industrial capabilities or competitiveness.

As a result, Viet Nam lags well behind its regional role models in technology development. This has resulted in Viet Nam being a net importer of technology products, which, given the unsophisticated nature of its exports, has contributed to a negative trade balance. Moving up the technology ladder calls for the Government of Viet Nam and the private sector to design and implement

an agenda to boost the country's technological and innovation capacity.

Acquiring foreign technology and national diffusion are important processes in the development path, and technology transfer paths are crucial for Viet Nam. Foreign firms, suppliers and buyers offer Vietnamese firms an ideal source of technology and, as we have discussed, linkages with foreign producers in Viet Nam should be strengthened to enable spillover and learning.

Innovation systems and promoting R&D are the other main considerations. Viet Nam lacks a strong home grown R&D and innovation sector. This in turn is linked to the weaknesses within the higher education and vocational training system as well as within government institutes tasked with developing innovation and R&D in different sectors.

In sum, a reformulation of Viet Nam's industrial strategy and policies, as advocated by this report, requires firms to recognize the importance of R&D and innovation as well as of linkages to government research institutes. Support measures to encourage R&D and innovation will need to be incorporated into industrial policy in general, as well as in specific areas that may open opportunities for industrial development and structural change in Viet Nam.

BOX 13. Technology development strategies in the Tigers

Republic of Korea: The Korean government directly supported technological efforts in several ways. Private R&D was promoted by incentives and other forms of assistance. There were a number of direct incentives. These included tax exempt TDR (Technology Development Reserve) funds, which were subject to punitive taxes if not used within a specified period. The TDR funds could, however, be used for investment in the first venture capital fund (Korea Technology Development Corporation, launched with World Bank assistance) and in collaborative R&D with public research institutes.

The government also granted tax credits for 125 percent of R&D expenditures as well as for upgrading human capital related to research and the setting up of industry research institutes, accelerated depreciation for investments in R&D facilities and a tax exemption for 10 percent of the costs of relevant equipment. It reduced import duties for imported research equipment and cut excise tax on technology intensive products. The KTAC (Korea Technology Advancement Corporation) was established to help firms commercialize research results; a 6 percent tax credit or special accelerated depreciation provided further incentives.

The import of technology was promoted by further tax incentives:

- Transfer costs of patent rights and technology import fees were tax deductible;
- Income from technology consulting was tax exempt;
- Foreign engineers were exempt from income tax;
- The government gave *grants* and *long-term low interest loans* to participants in 'National Projects', which gave tax privileges and official funds to private and government R&D institutes to carry out these projects;
- The Korea Technology Development Corporation provided technology funding.

However, the main stimulus to industrial R&D in Republic of Korea came less from specific incentives than from the overall strategy that created large firms, gave them funding and protected markets, minimized their reliance on FDI and forced them into export markets. This is why Republic of Korea now has a 25 times higher R&D by industry as a share of GDP than Mexico, which roughly has the same size of MVA, but has remained highly dependent on technology imports.

Taiwan (Province of China): While the growth of Taiwanese (Province of China) R&D has some similarities to that of Republic of Korea, there are important structural differences. The Taiwanese (Province of China) government had more of an arm's length relationship with industry and did not promote the growth of large private conglomerates. It began promoting the development of local R&D capabilities in the late 1950s, when its growing trade dependence reinforced the need to enhance local innovative efforts to upgrade and diversify its exports. A Science and Technology Programme was launched in 1979, targeting energy, production automation, information science and materials science technologies for development. In 1982, biotechnology, electro-optics, hepatitis control and food technology were added to this list. The S&T Development Plan (1986–1995) continued strategic technology targeting, aiming at a total R&D of 2 percent of GDP for 1995; it did not quite achieve this – it reached 1.8 percent that year.

Around half of R&D in Taiwan (Province of China) is financed by the government, though the contribution has decreased over time. Private sector R&D has been weak relative to Republic of Korea because of the preponderance of small- and medium-sized enterprises (SMEs), which cannot afford the large minimum investments required for much of industrial research. However, enterprise R&D has risen over time as some firms (like Acer and Tatung) have developed to become large multinationals. Such R&D has been encouraged over the years by a variety of incentives:

- Provision of funds for venture capital;
- Financing for enterprises that developed 'strategic' industrial products (of which 151 were selected in 1982 and 214 in 1987);
- Measures to encourage product development by private firms by providing matching interest-free loans and up to 25 percent of grants for approved projects;
- Full tax deductibility for R&D expenses, with accelerated depreciation for research equipment;
- Special incentives for enterprises based in the Hsinchu Science Park (with government financial institutions able to invest up to 49 percent of the capital);
- Requiring larger firms to invest (0.5 to 1.5 percent of sales, depending on the activity) in R&D;
- The Taiwanese government launched several research consortia, funded jointly with industry, to develop critical high-technology products like a new generation automobile engine, 16M DRAM and 4M SRAM chips.

Singapore: The Singapore government launched a S$ 2 billion five-year technology plan in 1991. A number of sectors (information technology, microelectronics, electronic systems, materials technology, advanced manufacturing technology, energy and water resources, environment, biotechnology, food/agro technology and medical sciences) were selected for development. An R&D target of 2 percent of GDP by 1995 was set; as was the case in Taiwan (Province of China), however, the target was not met (in Singapore's case by a larger margin). The new science and technology plan, launched in 1997, doubled S&T expenditure to S$ 4 billion over five years, of which 30 percent is directed towards strategic industries chosen by the government.

There are several schemes in Singapore for the private sector to promote R&D:

- The Research Incentive Scheme for Companies (RISC) awards grants to set up 'Centres of Excellence' in strategic technologies, and is open to all companies;
- The R&D Assistance Scheme (RDAS) awards grants for specific product and process research that promotes enterprise competitiveness and is also open to all companies;
- The Cooperative Research Programme gives grants to local enterprises (at least 30 percent local equity) to develop their technological capabilities by working together with universities and research institutions;
- The National Science and Technology Board initiates research consortia to allow companies and research institutes to pool their resources for R&D, and five consortia have already been set up (on marine technology, aerospace, enterprise security architecture, digital media and advanced packaging);
- The Innovation Development Scheme (IDS) provides a 50 percent grant to all promising innovation projects; the latest round provided S$ 130 million to 90 companies, local and foreign, in April 1997;
- More recently, the government has begun promoting high-tech entrepreneurial start-ups similar in spirit and style to Silicon Valley. Whereas earlier local start-ups were mainly limited to manufacturing, primarily as suppliers and contract manufacturers to MNCs, the new ones are geared more towards product innovation and focus on IT, software, internet applications, biotechnology and life sciences. Venture capital (VC) and 'business angels' have become increasingly important as a source of funding. The VC industry began to take off rapidly from the mid-1990s, with the funds managed exceeding S$ 10 billion in 2000. In 1999, 71 startups received S$ 252 million in VC funding, with 50 percent in information and communications/media technologies, 15 percent in electronics, 17 percent in transportation and logistics; and 12 percent in industrial products. In particular, spin-offs from universities and public R&D institutions are increasing in frequency.

According to the government, these schemes have succeeded in raising the share of private R&D in Singapore to 65 percent of the total. The Singapore government also plays a catalytic role in promoting selected technologies.

Source: Lall, 2001.

Although the example of the advanced Asian Tigers is not directly replicable in the Vietnamese context, interesting lessons can be gleaned regarding the priorities for sound technology policy. For instance, policy responses to deepen the technological structure of Republic of Korea's industry focused on the following steps: a) creating demand and supply for new technologies, b) acquiring foreign technology and capital goods, c) promoting diffusion in the national economy, and d) promoting R&D activities.[40] Box 13 describes technology development strategies in three mature Asian Tigers: Singapore, Republic of Korea and Taiwan (Province of China).

Based on international best practice, there are two main strategies to upgrade technology capacity for industrial development: technology transfer and domestic R&D. The government can play an important role in guiding both streams.

40 For a full discussion of technology policy in the Republic of Korea case, see Kim & Dahlman (1992).

6.4.1. Technology transfer systems

Technology transfer and spillover effects are an important part of traditional theory regarding FDI for industrial development. Evidence suggests that the transfer of technology from MNCs to domestic industry can be beneficial, but that it can also take place in a very ineffective manner. There is therefore room for government to adopt technology policy to maximize these transfer benefits.

The spillover of technology is part of the public goods associated with FDI, and is driven by the introduction of more sophisticated technology and superior management practices when an MNC penetrates a new market, resulting in an increase in productivity among domestic firms (Nguyen et al, 2008).

Technology transfer is suggested to occur in either one of two ways: horizontal transfer or vertical transfer. The mechanisms for horizontal technology transfer include a) learning by observing and imitating, b) movement of employees between MNCs and domestic companies, and c) through competitive pressure placed on domestic firms (Le & Pomfret, 2008). Findings indicate that this modality has very little effect on the actual transfer of technology (Le & Pomfret, 2008); competitive pressures from MNCs in a competing context may actually have adverse effects on domestic firms, and movement towards domestic firms from MNCs may also be quite low.

Vertical technology transfer effects occur through linkages between MNCs and local suppliers or postproduction facilities. In this case, MNCs may actually supply the domestic firm with the new technology in a bid to improve productivity in the production chain. Other vertical linkages can include technical assistance, training or incentives for the domestic firms (Le & Pomfret, 2008). Evidence shows that this type of technology transfer could occur in Viet Nam and has contributed to learning and the upgrading process, given proper managerial structures in the firms (Tran, 2011).

There are suggestions in the literature that absorptive capacity levels also play an important role in the potential for technology transfer (Nguyen et al., 2008). As discussed in this report, industrial development is a path dependent process and upscaling technology is also best developed as a progressive strategy through several levels of advancement.

The spillover effects of MNC penetration are therefore not guaranteed to have a positive outcome effect and may have a negative effect through market stealing in the domestic market. The government has an important role in mitigating the negative effects of MNC penetration and maximizing the transfer potential between international and domestic industry. Government policies can a) build stipulations for industry linkages between incoming corporations and domestic companies; b) focus IPAs to attract industries that match the existing industrial mix, and c) target industries beneficial to future development directions.

6.4.2. Science and technology research

Viet Nam has recently made notable steps to promote the development of domestic technology for industrial uses. Initially, science and technology (S&T) centres were established as academic structures rather than economic ones (Tran, 2011). The commercialization of R&D is considered a "deployment and application of technologies", and often exists as a subsidiary of the parent organization. S&T institutes tend to be divided into three sections:

- Technology implementation;
- Institute or agency programmes;
- National research programmes.

These sections lack synergies between the different functions. In conjunction with a tendency to focus on R&D, not manufacturing, most government spending in S&T is not translated into technologies that can be commercialized for economic development (Tran, 2011).

The National Foundation for S&T Development (NAFOSTED) run by MOST is mainly directed at research in basic sciences such as engineering and human and social sciences. The specific foundation devoted to technology innovation (the National Foundation for Innovation) has been adopted by MOST as a new attempt to support this activity.

In response to this deficiency, the government has more recently started developing a system of national labs in strategic fields. As of 2011, these labs are still in the early phases of development or not yet complete. Funding is relatively modest at present, but

these centres will hopefully become a major source of new technologies over the next few years. They have also become available for contracting and consulting, though details remain unclear – equipment and prototypes are sold to industry and research is tailored to meet industry's needs.

A promising initiative was introduced under the title TechMart, a technology fair forum which promotes collaboration between research centres and industry. This forum has led to the signing of many research contracts between S&T institutes and industry partners (Tran, 2011).

The employment of government funded R&D institutes has great potential to improve technology development and innovation, especially for smaller industries. For larger industries in Viet Nam, R&D subsidies or tax incentives can also play an important role in closing the gap to regional competitors.

Policy recommendations to boost Viet Nam's human resources for technology development are as follows:

1. The government must first thoroughly examine the structure, capabilities and relevance of *technology institutes,* including standards and metrology, R&D support, regional technology centres and technology financing. Special attention should be paid to *ISO 9000 certification,* with financial incentives for smaller firms to help with set-up costs;

2. It should launch a *technology foresight* exercise to raise awareness of industry's technological weaknesses and create consensus between industry, research institutes and the bureaucracy on measures that need to be implemented to remedy those weaknesses. This exercise should be widely publicized and enjoy widespread support by the highest levels of government;

3. It should *introduce measures to stimulate technological efforts* in industry: R&D, process/product engineering, quality improvement and cost reduction among larger firms, productivity and quality improvement among smaller ones. The incentive system for R&D needs to be examined and, if necessary, further strengthened. Many East Asian countries offer more than full tax deductibility for R&D – Malaysia offers 200 percent and Republic of Korea 125 percent. Taiwan (Province of China) penalizes firms that do not invest a percentage of turnover in R&D as specified for their industry. As a first step, the government should *conduct a review* of existing incentives in different countries and offer at least full (100 percent) tax deduction for legitimate technological expenditures. Next, it should consider offering other incentives in the form of tax credits, technology awards and prizes, subsidies for joint R&D with public enterprises or R&D institutes (see below) and tariff-free import of R&D related equipment. It should also consider the liberal use of expatriate personnel for technological activities and intense collaboration with institutes and enterprises overseas;

4. The government should conduct a comprehensive *survey of technological activity and capabilities* in industry; this survey should be updated periodically. The survey should be accompanied by a *benchmarking exercise* that allows Vietnamese enterprises to compare their technical performance against competitors. In the UK, for instance, two major benchmarking efforts are being implemented. First, the PROBE software developed by the London Business School in conjunction with the Confederation of British Industry collects data on leading European enterprises and is used by all large UK companies. Second, the Department of Trade and Industry in the UK (now the Department of Business, Innovation and Skills) developed benchmarking tools specifically for SMEs to be administered by Training and Enterprise Councils, industry-led bodies that determine local strategies for training and development throughout England and Wales, and the Business Links programme. It uses a very simple questionnaire to assess the technological levels of SMEs and follows up with consultancy services to help firms improve. A similar tool should be devised for Vietnamese SMEs and implemented at the local level;

5. The government should launch a programme to *stimulate linkages between industry and S&T infrastructure* (R&D laboratories and universities). These can include restructuring the laboratories and imposing 'hard budget' constraints that force them to contract work from industry, a measure now common in many developed and developing countries. Other measures include encouraging the placing of research students in industrial establishments, joint research awards by industry and universities for work on subjects of relevance to

industry, and providing incentives to university research staff to work with industry. The Indian government has recently carried out a major reform of its public R&D laboratories under the Council of Scientific and Industrial Research (Box 14). This may be a useful lesson for Viet Nam;

BOX 14. Reforming the technology infrastructure in India

India has a large infrastructure of 40 public research laboratories under the Council of Scientific and Industrial Research employing over 17.000 scientists and technicians. In the late 1980s, as a result of the recommendations of a high-level government committee, which found that the CSIR was contributing little technological benefit to industry, the government launched a major reform programme. This programme coincided with a World Bank Industrial Technology Development project which included a scheme to upgrade technology institutes and strengthen their linkages with industry. This project helped shape the direction of reform and provided technical assistance to help reorient the laboratories and train their managers and staff.

The Indian government decided to limit financing of the laboratories, setting a target for CSIR to earn 40 percent of its expenditures by selling research and other services to industry. The institutes intensified their efforts to earn industrial revenues, which rose from Rs 800 million in 1992–1993 to Rs 2,100 million in 1996–1997, and were targeted to reach Rs 5,500 million in 2000–2001. Overseas contracts amounted to US$ 2 million in 1996–1997 and were expected to reach US$ 4–5 million by 1997–1998. While running slightly below target, external earnings in 1996 provided 16.4 percent of its total expenditures.

Some laboratories, such as the National Chemical Laboratories in Pune, have been much more successful than others and now earn over 50 percent from industry (the bulk deriving from contracts from companies abroad). This laboratory's achievements resulted in the director being appointed head of the CSIR, and he remains the driving force behind the reform.

The record of success varies. By the late 1990s, 10 of the 40 laboratories had reformed their structures, another 10-15 were in the process of changing their structures and approach, and the rest had yet to implement serious internal reforms. Poor location, lack of industrial demand and rigid employment policies were partly to blame in the case of the laggards, but a very important factor was the commitment of the laboratories' leadership. Changing management's attitude was more difficult than initially anticipated despite the financial incentives given (the annual budget of each laboratory was determined by revenue performance).

Nevertheless, there is now sufficient momentum in the reform, supported by frequent meetings of the laboratory heads and training courses, so that the system as a whole is evolving to meet industrial needs. The record of pure research in terms of patents and international publications has improved with greater market orientation: many laboratories that do well in one market also do better in others.

Another important component of the World Bank's Industrial Technology Development project in India was the promotion of industry-sponsored research at public research institutes as well as at Indian Institutes of Technology, other universities and private research foundations. This component, the Sponsored R&D (SPREAD) Fund, was aimed at promoting research awareness, especially among small and medium-sized companies, and at changing the 'research culture' of research laboratories and higher education establishments. The fund was administered by a newly established technology cell in the Industrial Credit and Investment Corporation of India (ICICI), a private sector development bank. This technology cell helped firms to identify the appropriate research institute, develop their business plans, liaise with the institute and generally 'hold the hands' of new entrepreneurs (like a venture capitalist). The funds were offered as conditional loans rather than grants, and the enterprise had to provide matching funds from its own resources.

By the end of 1997, around 100 firms had contracted 95 projects under this programme, with an average project size of US$ 400.000 and an average loan component of US$ 170.000. So far, no failures have been reported, though some 3–4 projects were likely to be cancelled. Most of the companies using the programme had never contracted research to a public research institute before; the large majority were small and medium sized. Some 50 different technology institutes were involved, including 5 Institutes of Technology/Science, 12 universities, 5 private research foundations and 28 government laboratories. Overall, the project has been highly successful in technological terms; the subsidy element has been minimal and most firms claim that they will continue their links with the research institutes in the future.

The elements that account for the success of this project are a 'matchmaking' intermediary (ICICI, a well-established private financial institution with in-depth knowledge of industry) to administer the funds and overcome information and trust barriers between researchers and business; a technically-oriented unit in this intermediary to assess the viability of applications and to 'offer a hand' as the projects develop (more like venture capitalists than bankers); the granting of finance in the form of loans rather than grants with a substantial matching contribution by entrepreneurs; and significant efforts with technology institutes to help them understand the needs of industry and change their operating 'culture'.

Source: Lall, 2001.

6. *Strengthen SME extension and support services.* As a first step, the government should send missions to countries like Taiwan (Province of China), Japan and Singapore to see how they manage their SME support programmes and draw appropriate lessons for Viet Nam. The government should consider the following measures to help SMEs. First, it should set up *industrial productivity centres* in the main SME clusters along the lines of the Hong Kong Productivity Council or Taiwan's (Province of China) China Productivity Centre. These centres will help SMEs understand and overcome technological problems, with proactive campaigns to reach out to their clients and provide comprehensive packages of technical training, marketing and financial assistance. Second, *industrial subcontracting and partnership exchanges* of the type being promoted by UNIDO could be introduced. This would involve the establishment of (relatively small) service centres to collect information on the production capacities of SMEs and assist them in improving their capabilities and entering into supply relations with large firms. This would be particularly important for upgrading the capabilities of engineering firms. Third, *donor assistance programmes* for SMEs can provide low cost but experienced technical manpower from developed economies to raise the engineering and design capabilities of SMEs in Viet Nam;

7. The government should set up *a technology import information service or database* to collect data on foreign sources of technology. Such services are extremely active in the Tigers with online links in all major industrial areas; SMEs find them particularly helpful for overcoming the information gaps they face in accessing new technologies;

8. The government should initiate a *technology finance* system, either by setting up a venture capital company or by establishing technology 'windows' in existing financial institutions. However, technology financing requires special skills and a very different orientation from normal banking, so this would call for very careful handling, even if the Vietnamese banking sector were reformed and liberalized;

9. At the context level, the government should aim for the creation of an improved legal system for a technology market (including regulations on science and technology contracts); and the promotion of organizations required for technology management (such as arbitration, registration of contracts, management of technology transactions, etc.).

6.5. Attracting quality FDI for manufacturing

The early 21st century poses a new set of challenges to industrialization. Chains of production have become increasingly dispersed through increasing factor mobility and systems integrator multinationals, modularity and subcontracting have transformed the production of high value manufactures. Thus, gaining a foothold in the production of components has become increasingly difficult.

Quick stats:

- FDI supplies 39 percent of exports and 18.68 of GDP;
- Supplies 1.467 million jobs;
- Share of FDI in manufacturing fell from 45 percent to 17 percent between 2008 and 2009;
- Real estate, hotels and restaurants saw the share of investment rise to a combined 73 percent;
- In 2008, FDI exports were US$ 34.9 billion while imports attributed to FDI enterprises was US$ 28.458 billion (Nixson, 2010: 59).

Attracting FDI into components industries is essential to industrial upgrading and is best achieved through the attraction of TNCs. These companies introduce technology, industry knowledge and access to global supply chains. They also provide the method to promote investment in R&D and help overcome limitations in national industrial systems. Attracting such investment has become a competitive factor for countries on a development path and has become central to national innovation systems. As we will discuss in the following sections, FDI can also have a beneficial spillover effect into technology and human resource development.

While the global downturn has certainly affected FDI globally, it is worrying that Viet Nam may be attracting more speculative real estate investment over more productive manufacturing FDI, even during the economic downturn. It is increasingly apparent that Viet Nam needs to pay more attention to the quality of the FDI it is attracting and FDI's ultimate benefit for the country. While FDI in real estate and investment may be welcome when there is a capital shortage, it can also help fuel dangerous asset bubbles.

BOX 15. Best practice in investment promotion agencies: Example of Ireland's Industrial Development Agency (IDA)

Ireland's investment promotion agency, the IDA (Industrial Development Agency), is recognized as one of the most efficient IPAs in the world and was central to Ireland's transition from an agricultural producer to a high-tech, high skills economy.

Ireland had a reasonably strong base and commitment to education which set the platform for the IDA. Ireland placed a heavy emphasis on the development of institutes of technology, particularly on computing. This human capital base allowed the IDA to market Ireland to key industries as a high skills base at the gates to Europe.

Based on this foundation in computing skills, the IDA used a strategy of "picking winners", targeting specific industries and negotiating incentives directly with foreign investors, mainly targeting the information and communications technologies (ICT), biotechnological and financial services sectors. The autonomy to engage in individual negotiation and consulting was considered to have a positive effect on enticing companies, and also on negotiating linkages. Responses are based on identifying investor demands relevant to Irish technology skills and designing a marketing strategy to sell Ireland as an R&D investment location.

The coherence of a central IPA with considerable autonomy and strong links with relevant national agencies is vital for reacting quickly and capturing investment opportunities.

The IDA has also played a role in building the research infrastructure in the country, an almost unique role for an IPA. There is also a belief in a snowball effect; small R&D investments help to facilitate future R&D projects and assignments within subsidiaries.

Source: Guimon, 2009.

Similarly, FDI in low-tech, low cost labour manufacturing may generate employment, something Viet Nam desperately needs, but is not helping Viet Nam change the structural nature of its manufacturing exports and is furthermore failing to support domestic industries through spillover effects. The current structure of FDI is also having little positive effect on Viet Nam's trade balance, with many FDI firms relying heavily on imports for their production.

To attract high quality FDI, it is imperative to identify synergies between the corporate strategies of TNCs, potential national benefits and national skills capacity. This process should provide targeted marketing of the country as an investment option; precipitate the streamlining of corporate bureaucracy and the creation of a corporate friendly environment; and guide academic training to build national skills capacity (including English skills).

The Foreign Investment Agency of the Ministry of Planning and Investment has been successful in advertising Viet Nam as an investment destination, using embassies and consulates to reach out to potential investors in strategic industries. However, investment policy needs to move beyond raising awareness and facilitation to achieve greater coordination and coherence in government investment policy through the creation of an agency that effectively represents the interests of investors. Many foreign investors currently perceive the fragmentation of regulation and administration as an obstacle, and many of the policies that contribute to competitiveness do not fall under the purview of the agency responsible for investment, promotion and facilitation.

In recent years, studies of investment promotion have emphasized the importance of policy coordination and coherence to attract and retain foreign investment. This is understandable in view of the wide array of policies that influence investment decisions as discussed above. The capacity of government agencies to coordinate policy, act in unison, share information and reduce inter-agency conflicts and inconsistencies is an essential component of investment promotion, if not the most important factor in attracting desirable foreign investment. In one influential study, Jacques Morisset analysed cross section data from 58 countries to gauge the effects of different investment promotion activities on FDI. He divides investment promotion into four distinct activities: i) image building, consisting of advertising and public relations; ii) investment facilitation and servicing; iii) investment generation or targeting specific companies and sectors; and iv) policy advocacy, "through which the agency supports initiatives to improve the quality of the investment climate and identifies the views of the private sector on that matter" (Morisset, 2003). Morriset finds that investment promotion does succeed in attracting FDI, but that policy advocacy is

the most effective activity, followed by image building and facilitation. Investment generation, in which promotion agencies target individual companies or sectors, does not work as well.

Thus, the most effective investment promotion agencies not only advertise the country to investors, but also work on behalf of investors for policy changes that address investors' needs. Morisset also finds that the form of the investment promotion agency affects its capacity to carry out these functions. Purely public sector agencies do not perform as well as agencies that have some form of private sector representation. In fact, more private sector representation appears to translate into greater effectiveness. One explanation for the greater success of public-private institutions is that they have more credibility as policy advocates for investors. Agencies also work better if they report directly to the head of government rather than to a minister or lower level official (Morisset & Andews-Johnson, 2004).

The US$1 billion investment by Intel in Viet Nam in 2008 and Canon's continued expansion into Viet Nam shows that strategic investment in manufacturing is possible, and the experiences of Costa Rica, Singapore and Ireland offer examples of how Viet Nam can expand its efforts to attract high quality FDI.

While investment promotion can be expensive and skill-intensive, small economies can conduct it effectively. A much more recent successful example is the case of Costa Rica (Box 16). This small country with a tiny industrial base has succeeded in attracting Intel's first, and so far only, semiconductor plant in Latin America in the face of fierce competition from larger and more industrialized neighbours.

If Viet Nam is to compete for export-oriented and technology intensive FDI, it will have to set up a modern Investment Promotion Agency (IPA) along the lines of Costa Rica, which is able to compete with counterparts across the world. Table 15 presents the main functions and activities of modern IPAs.

BOX 16. Costa Rica's attraction of Intel's only semiconductor plant in Latin America

The main form of international economic activity in the Caribbean Basin economies has historically been the export of natural resources, mainly bananas. This started to change in the 1980s, when US MNCs attempted to overcome Asian competition by spreading production networks to the Caribbean Basin. However, most of these manufacturing operations mainly consisted of simple assembly of imported components, concentrated in export processing zones isolated from the domestic economy. Most FDI in countries like Costa Rica, Jamaica and the Dominican Republic, major recipients of export-oriented FDI, was directed at garments. MNCs were attracted by low labour costs and fiscal incentives; they used virtually no local physical inputs. This led to an enclave of MNC activity with few beneficial spillovers in terms of linkages and technology and skills transfers to local companies.

Costa Rica broke this mould in 1997 by attracting a US$ 500 million facility from Intel for the manufacture and testing of semiconductors. How did Costa Rica succeed in beating competition from such countries as Brazil, Chile and Mexico for this investment? Costa Rica had a long tradition of stability and democracy. It had a well-educated workforce and an education system capable of providing technical and electronic skills at all levels. It had relatively good infrastructure and its decision-makers were committed to moving the economy into technology intensive activities and reducing dependence on simple labour-intensive activities.

However, these advantages would have mattered little had Costa Rica not had a very effective investment promotion agency, CINDE. The agency worked closely with the highest levels of government and involved the president of the country in wooing Intel. It was able to implement an aggressive policy of targeted incentives designed to meet the competitive needs of the company, not only by offering tax breaks, but also by improving local skills, infrastructure and procedures. The government promised to provide cheap energy to the plant, to improve the necessary physical infrastructure, and to implement training programmes specifically designed for the needs of the company. This represents a radical change from the generalized incentives previously used, which did not discriminate between sectors and companies.

The Intel investment promises much. Exports of high-tech products have grown dramatically. Even by 1998, semiconductor exports exceeded exports of traditional products like bananas and coffee. Follow-on investments by Intel's suppliers are expected. Some 40 firms are expected to invest an additional US$ 500 million and build a new high-tech cluster with important spillover effects. Recent policy announcements by the Dominican Republic indicate a similar shift in FDI strategy from horizontal to targeted promotion: its officials have recently unveiled plans to attract investment into computer and telecommunications-based industries. The main instruments to be adopted include training programmes geared towards the needs of telecommunications intensive activities such as call centres and computer-based data handling industries. Judging by Costa Rica's experience with Intel, a more aggressive strategy of targeting key global players in these

industries may be a necessary supplement to these measures.

The story of how CINDE attracted Intel to Costa Rica has become folklore in investment promotion circles. But how did CINDE reach that point of promotional effectiveness? CINDE was formed in the mid-1980s with significant involvement of the Costa Rican private sector and with substantial funding from the United States Agency for International Development. Very early in its development, CINDE adopted a highly targeted approach to investment promotion. Thereby, the nascent agency was being advised by Ireland's Industrial Development Authority. Indeed, a seasoned IDA executive served as a resident adviser to CINDE for two years in the mid-1980s. This adviser, Tony Shields, introduced the principles of promotion to CINDE which had worked well in Ireland and which, along with Singapore, sets global best practice in investment targeting and promotion.

The agency's targeting focus was largely geographic (US) and sectoral (electronics). A lean overseas promotional organization was developed with highly trained and well-paid Costa Rican nationals engaging in personal marketing to target companies. These individuals were encouraged to build long-term relationships with the target companies identified and the agency developed a compensation system that allowed for bonuses for high performing promotional executives. Much attention was also placed on the development of an agency-wide investor tracking system to create an organizational memory of promotional activity, in addition to providing a basis for personnel evaluation and compensation.

CINDE succeeded in attracting mostly small electronic firms to invest in Costa Rica during the late 1980s and early 1990s. Its greatest success was Intel's entry, but this was preceded by many individual ones in the form of the attraction of small electronic firms, which planted the seeds for an electronics cluster in Costa Rica.

Source: Rodriguez-Clare, 2001.

TABLE 15. Investment Promotion Agency (IPA) functions

Category	Objective	Result
Strategy and organization	Setting national policy context. Setting investment objectives. Setting structure. Setting sector, cluster strategy. Creating information base.	Government commitment to FDI attraction. Attracting FDI to promote technology transfer, skill development, exports, industrial deepening, R&D, etc. Structure of IPA, relations with government departments, location in decision-making hierarchy, network of regional/international offices, collaborators and interlocutors. Competitive positioning of economy, priority setting by activity, upgrading existing activities over time. Database on local conditions, potential investors, competitors, international trends.
Image building	Create or change image of location as investment site.	Public relations, general advertising, website and other IT tools. Information seminars, general trade missions, participation in trade shows and conferences.
Investment prospecting	Directly attract new investment in areas of most economic interest.	Direct mail campaigns, telemarketing, firm-specific direct selling, targeted advertising, participation in trade shows/conferences. Focus on selected sectors and investors, use of business networks. Provision of accurate, up-to-date and useful comparative information, effective response to enquiries.
Lead generation and investment facilitation	Facilitate and realize new investment	Lead generation, handling 'major enquiries', pre-investment site visit, gradual development of relations with key executives. Negotiation of investment package, license and permit facilitation, land and factory acquisition, infrastructure provision.
Competitive advantage creation	Ensure that local factors and institutions meet needs of targeted investors.	Improve specific skills and institutions needed by targeted investors. Create industry-specific infrastructure and reduce business transaction costs. Show willingness to listen, adapt and improve to please customers.
Investor services and after-care	Follow-up services for existing investors, customer satisfaction surveys, linkage promotion, upgrading of activities.	Identifying local business partners, sites for expansion, training opportunities. Contact, monitoring and assistance. Improve local support institutions. Involvement in FDI promotion "The best ambassador is a satisfied customer". Helping to develop 'quality of life' for foreign investors. Ability to provide incentives and institutional assistance for R&D, skill development and linkage creation with suppliers, universities and technology institutions.
Evaluation of IPA activities	Monitor, evaluate and improve functioning of IPA.	Targets and assessment of leads generated, investors attracted, advertising, tours, etc. Jobs and exports created. Linkages created. Quality of employment. Benchmarking of IPA performance against competitors and best practice.

Source: Lall, 2001.

Based on the above and on Pincus (2011), important lessons to be considered for Viet Nam are as follows:

- Identify target sectors and processes;
- A strong, autonomous, well-funded and strategically planned IPA is vital for capitalizing on potential FDI interest. This should include meritocratic hiring procedures and be directly responsible to the Office of the Prime Minister;
- Developing a human capital base in strategic sectors is vital to making Viet Nam an inviting destination for foreign investment. This should include a role for the IPA;
- Restructuring of bureaucracy and financial incentives for foreign-owned companies improves the business environment and increases the ease of doing business;
- Targeting research institutes and creating a research base can be an important move: Ireland targeted Georgia Tech, Fraunhofer and Stanford Research;
- Potential investor opportunities should be ranked according to quality and best opportunities followed;
- The majority of R&D investment occurs within already existing MNC subsidiaries. Viet Nam should analyse the current composition of existing foreign subsidiaries and target key companies in key sectors. Alternatively, a longer term approach to attract new industries to Viet Nam can be taken, planning R&D support in the future (for example, 10 years) when the companies are established;
- After-care of investing companies should be emphasized;
- The creation of a new Technology Development Agency (TDA) established under the Office of the Government and reporting directly to the Prime Minister and under the day-to-day supervision of the Head of the Office of the Government;
- The main function of the TDA would be to coordinate government policies to attract and retain high-tech investments of domestic and foreign corporations;
- An Advisory Board for the TDA would be created including senior leaders from relevant government agencies and at least one domestic and foreign investor;
- The staff of the TDA would consist of investment professionals that would take direct responsibility for individual investment projects and would coordinate the government's efforts to secure and maintain strategic investment projects;
- Recruitment of TDA professionals would be based on merit and competitive selection, and TDA officials would receive salaries that are competitive with those of the private sector;
- The TDA would initiate voluntary programmes to encourage high-tech companies (both domestic and foreign) to link to domestic suppliers.

ANNEXES

A. Data source and technological classification of exports and manufacturing value added (MVA)

The source of data for trade is the United Nations Commodity Trade Statistics Database (COMTRADE). The technological classification of trade is based on the Standard International Trade Classification (SITC) revision 3, and classifies all products in four categories: resource-based manufactured exports, low-technology manufactured exports, medium-technology manufactured exports and high-technology manufactured exports.

Technology classification of exports according to SITC Rev. 3

Type of exports	SITC sections
Resource-based exports	016, 017, 023, 024, 035, 037, 046, 047, 048, 056, 058, 059, 061, 062, 073, 098, 111, 112, 122, 232, 247, 248, 251, 264, 265, 281, 282, 283, 284, 285, 286, 287, 288, 289, 322, 334, 335, 342, 344, 345, 411, 421, 422, 431, 511, 514, 515, 516, 522, 523, 524, 531, 532, 551, 592, 621, 625, 629, 633, 634, 635, 641, 661, 662, 663, 664, 667, 689
Low-technology exports	611, 612, 613, 642, 651, 652, 654, 655, 656, 657, 658, 659, 665, 666, 673, 674, 675, 676, 677, 679, 691, 692, 693, 694, 695, 696, 697, 699, 821, 831, 841, 842, 843, 844, 845, 846, 848, 851, 893, 894, 895, 897, 898, 899
Medium-technology exports	266, 267, 512, 513, 533, 553, 554, 562, 571, 572, 573, 574, 575, 579, 581, 582, 583, 591, 593, 597, 598, 653, 671, 672, 678, 711, 712, 713, 714, 721, 722, 723, 724, 725, 726, 727, 728, 731, 733, 735, 737, 741, 742, 743, 744, 745, 746, 747, 748, 749, 761, 762, 763, 772, 773, 775, 778, 781, 782, 783, 784, 785, 786, 791, 793, 811, 812, 813, 872, 873, 882, 884, 885
High-technology exports	525, 541, 542, 716, 718, 751, 752, 759, 764, 771, 774, 776, 792, 871, 874, 881, 891

The source of data for total MVA is the United Nations Industrial Development Organization (UNIDO) database. The source of the data for value added of branches within the manufacturing sector is the UNIDO Industrial Statistics database. The technological classification of MVA is based on the International Standard Industrial Classification (ISIC), revision 2, and classifies all products in four categories: resource-based manufacturing, low-technology manufacturing, medium-technology manufacturing and high-technology manufacturing.

Technology classification of MVA according to ISIC Rev. 2

Type of activity	ISIC division, major groups or groups
Resource-based manufacturing	31, 331, 341, 353,354, 355, 362, 369
Low-technology manufacturing	32, 332, 361, 381, 390
Medium-technology manufacturing	342, 351, 352, 356, 37, 38 (excl. 381)
High-technology manufacturing	3522, 3852, 3832, 3845, 3849, 385

Because reporting of data at the group (four-digit) level of ISIC is inadequate to allow separation of medium- and high-tech products, the category "high-technology manufacturing" was not used; instead, medium- and high-tech (MHT) products were combined in one category. The sectoral shares of value added were then calculated in relation to the total for manufacturing subsectors.

B. Sectoral analysis for resource-based industry and classification of product groups

Champion

Above average RB exports

1 Heavy petrol/bitumen oils
2 Rubber tyres/treads
3 Edible products nes
4 Cereal etc flour/starch
5 Vegetable root/tuber prep/pres

Below average RB exports

1 Copper ores/concentrates
2 Liquid propane/butane
3 Residual petroleum products
4 Fixed vegetable oil/fat, soft
5 Non-ferrous base metal waste nes
6 Chocolate/cocoa preps
7 Beverage non-alcohol nes
8 Fruit preserved/fruit preps
9 Rubber synthetic/waste/etc
10 Precious metal ore/conc.
11 Animal/vegetable oils processed
12 Flour/meal wheat/meslin
13 Meat/offal preserved
14 Animal oil/fat
15 Cereal meal/flour nes

Underachiever

Below average RB exports

1 Iron ore/concentrates
2 Ferrous waste/scrap
3 Fixed vegetable oils not soft
4 Sugar/molasses/honey
5 Cheese and curd
6 Essential oil/perfume/flavour
7 Base metal ore/concentrates nes
8 Meat/offal preserved nes
9 Margarine/shortening
10 Coal gas/water gas/etc

Overachiever

Above average RB exports

1 Nitrogen function compounds
2 Glass
3 Wood simply worked
4 Veneer/plywood/etc
5 Lime/cement/construction material
6 Tobacco, manufactured
7 Articles of rubber nes
8 Clay/refractory material
9 Fish/shellfish, prep/pres
10 Starches/glues/etc.
11 Materials of rubber
12 Sugar confectionery

Below average RB exports

1 Paper/paperboard
2 Organo-inorganic compounds
3 Alcoholic beverages
4 Hydrocarbons/derivatives
5 Elements/oxides/halo salt
6 Pulp and waste paper
7 Other organic compounds
8 Metal salts of inorganic acid
9 Fruit/vegetable juices
10 Synthetic org colour agents
11 Aluminium ores/concentrates/etc
12 Wood in rough/squared
13 Other inorganic chemical
14 Misc non-ferrous base metal
15 Butter and cheese
16 Petrol./hydrocarbon gas
17 Dyeing/tanning extracts
18 Cork manufactures
19 Vegetable text fibre ex cot/ju
20 Uranium/thorium ore/concentrate
21 Jute/bast fibre raw/retd

Decline

Above average RB exports

1 Mineral manufactures nes
2 Wood manufactures nes

Below average RB exports

1 Pearls/precious stones
2 Nickel ores/concentrates/etc
3 Fish, dried/salted/smoked
4 Briquettes/lignite/peat

Source: UN Comtrade. Products are ranked by their global trade value in 2009.

C. Sectoral analysis for low-tech industry and classification of product groups

Champion		Overachiever	
	Above average LT exports		***Above average LT exports***
1	Furniture/stuff furnishing	1	Articles of apparel nes
2	Articles nes of plastics	2	Women's/girls' clothing woven
3	Footwear	3	Men's/boys' wear, woven
4	Jewellery	4	Textile yarn
5	Made-up textile articles		
6	Women's/girls' wear knit/crochet		***Below average LT exports***
7	Trunks and cases	1	Musical instruments/records
8	Men's/boys' wear knit/crochet	2	Cut paper/board/articles
		3	Special yarns/fabrics
	Below average LT exports	4	Hand/machine tools
1	Base metal manufactured nes	5	Knit/crochet fabrics
2	Iron/steel pipe/tube/etc	6	Headgear/non-text clothing
3	Baby carrier/toy/game/sport	7	Leather
4	Misc manufactured articles nes	8	Floor coverings etc.
5	Flat rolled iron/steel products	9	Office/stationery supply
6	Iron/steel bars/rods/etc	10	Woven textile fabric nes
7	Iron/steel/alum structures	11	Cutlery
8	Flat rolled alloy steel	12	Tulle/lace/embr/trim etc
9	Rolled plated m-steel	13	Pottery
10	Nails/screws/nuts/bolts	14	Leather manufactures
11	Base metal household equipment	15	Fur-skins tanned/dressed
12	Metal store/transport cont		
13	Wire prod except insurance electric		
14	Iron/steel railway material		

Decline	
	Below average LT exports
1	Cotton fabrics, woven
2	Clothing accessories
3	Glassware
	Below average LT exports
1	Cotton fabrics, woven
2	Clothing accessories
3	Glassware

Source: UN Comtrade. Products are ranked by their global trade value in 2009.

D. Sectoral analysis for medium-tech industry and classification of product groups

	Champion
	Above average MT exports
1	Ships/boats/etc
2	Industrial heat/cool equipment
3	Misc chemical products nes
4	Domestic equipment
5	Medical/etc instruments
6	Plastic sheets/film/etc
7	Taps/cocks/valves
8	Sound/TV recorders etc
9	Manufactured fertilizers
10	Optical fibres
11	Soaps/cleansers/polishes
	Below average MT exports
1	Fans/filters/gas pumps
2	Civil engineering plant
3	Plastic nes-primary form
4	Mechanical handling equipment
5	Perfume/toilet/cosmetics
6	Primary ethylene polymer
7	Pigments/paints/varnish
8	Pumps for liquids
9	Non-electronic machines nes
10	Mechanical transmission equipment
11	Polyacetals/polyesters
12	Alcohols/phenols/derivatives
13	Agricultural machine ex tractor
14	Primary/products iron/steel
15	Lighting fixtures etc
16	Railway vehicles/equipment
17	Pig iron etc ferro alloy
18	Household/garden chemical
19	Metalworking machine nes
20	Tractors
21	Plastic tube/pipe/hose
22	Sanitary/plumb/heat fixt
23	Food processing machines
24	Steam generating boilers
25	Steam/vapour turbines
26	Meters and counters nes
27	Iron/steel wire
28	Prefabricated buildings
29	Monofilament rods/sticks
30	Plastic waste/scrap
31	Explosives/pyrotechnics

	Overachiever
	Above average MT exports
1	Motor vehicle parts/access
2	Electrical equipment nes
3	Electric circuit equipment
4	Electrical distribution equipment
5	Motorcycles/cycles/etc
6	Man-made woven fabrics
7	Textile/leather machinery
	Below average MT exports
1	Passenger cars etc
2	Internal combust engines
3	Goods/service vehicles
4	Engines non-electric nes
5	Road motor vehicles nes
6	Watches and clocks
7	Non-electronic parts/accessories for machine
8	Ball/roller bearings
9	Machine tools for remove material
10	Trailers/caravans/etc
11	Styrene primary polymers
12	Vinyl chloride etc polymer
13	Radio broadcast receiver
14	Metal machine tool parts
15	Paper industry machinery
16	Material machine tools without material-removal
17	Synthetic spinning fibre
18	Man-made fibres nes/waste

	Decline
	Below average MT exports
1	Special industrial machinery nes
2	Photographic supplies
3	Printing industry machinery

	Underachiever
	Below average MT exports
1	Television receivers
2	Carboxylic acid compound
3	Oil etc additives/fluids

Source: UN Comtrade. Products are ranked by their global trade value in 2009.

E. Sectoral analysis for high-tech industry and classification of product groups

	Champion		Overachiever
	Above average HT exports		***Above average HT exports***
1	Rotating electric plant	1	Telecommunications equipment nes
2	Elect power transmission equipment	2	Photographic equipment
3	Office machines		
	Below average HT exports		***Below average HT exports***
1	Medicaments include vet	1	Valves/transistors/etc
2	Pharmaceuticals except medicament	2	Computer equipment
3	Measure/control application nes		
4	Optical instruments nes		***Decline***
5	Medical etc el diagnostic equipment		
6	Radio-active etc material		***Above average HT exports***
		1	Office equipment parts/accessories.
	Underachiever		
			Below average HT exports
	Below average HT exports	1	Aircraft/spacecraft/etc
1	Power generating equipment nes		
2	Arms and ammunition		

Source: UN Comtrade. Products are ranked by their global trade value in 2009.

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