INDUSTRIALIZATION IN VIETNAM: AN ANALYSIS OF MANUFACTURING COMPETITIVENESS AND POLICY ALTERNATIVES

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INDUSTRIALIZATION IN VIETNAM: AN ANALYSIS OF MANUFACTURING COMPETITIVENESS AND POLICY ALTERNATIVES

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DECLARATION

I hereby declare that this thesis, entitled *Industrialization in Vietnam: An Analysis of Manufacturing Competitiveness and Policy Alternatives*, being submitted to Victoria University for the award of the Degree of Doctor of Philosophy, was carried out entirely by myself at the Centre for Strategic Economic Studies, Melbourne. This thesis is no more than 100000 words in length, exclusive of tables, figures, footnotes, appendices and references and has not either wholly or partly, been submitted for any other degree.

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LIST OF ACRONYMS

ASEAN	Association of South East Asian Nations
ASEAN-4	Association of South East Asian Nations – Indonesia, Thailand, Philippine, Malaysia
CIP	Competitive Industrial Performance
EOI	Export Oriented Industrialization
FDI	Foreign Direct Investment
FIE	Foreign Investment Enterprises
GC	Government Corporation
GDP	Gross Domestic Production
GNP	Gross National Production
GSO	General Statistics Office
ICT	Information Communication Technology
IMD	Institution Management Development
INDO	Indonesia
ISI	Import Substitution Industrialization
ISIC	International Standard of Industrial Classification
JICA	Japan International Cooperation Agency
LE	Large Enterprise
MC	Manufacturing Competitiveness
MALAY	Malaysia
MNC	Multi-national Company
NIC	Newly Industrializing Country
OC	Overall Competitiveness
OECD	Organization for Economic Cooperation and Development
PC	Personal Computer
PHI	Philippines
PPI	Producer Price Index
R&D	Research and Development
RCA	Revealed Competitive Advantage

SOE	State-owned Enterprise
SOC	State-owned Limited Liability Company
SME	Small and Medium-sized Enterprise
TC	Technology Capacity
TFP	Total Factor Productivity
THAI	Thailand
TNC	Trans-national Corporation
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
VCP	Vietnam Communist Party
VIET	Vietnam
WEF	World Economic Forum
WTO	World Trade Organization

ABSTRACT

Late industrializing countries can only achieve industrialization – a necessary development path to create an advanced economy – by upgrading manufacturing competitiveness. This process is particularly important in a rapidly globalizing world, which generates greater opportunities and challenges. Vietnam is a late industrializing economy but, despite rapid growth, the scale of Vietnamese manufacturing is still small, and productivity is relatively low. The objectives of this thesis therefore are:

- to measure manufacturing competitiveness in Vietnam and to analyse its determinants;
- to extend that analysis in a comparison with the ASEAN-4; and
- to assess the effect of various policy measures on Vietnam's manufacturing competitiveness.

To pursue these objectives, both comparative and regression analyses are undertaken based on a large dataset.

Many findings are presented, including the following. Firm competitiveness possesses a bell-shaped distribution across firm size if firm size is measured by number of employees, but increases uniformly with firm size if the measure of size is the level of capital employed. In terms of type of ownership, a joint venture between foreigners and a state-owned enterprise (SOE) provides the most competitive ownership type. Wholly-foreign enterprises became the largest sector within manufacturing by 2005, but their competitiveness is declining and they are heavily concentrated in labour-intensive industries. Domestic firms other than SOEs expanded rapidly after 2000, but their competitiveness remains weak. Despite relatively rapid growth, Vietnamese competitiveness is still markedly lower than that of the countries of ASEAN-4, and new policies will be necessary to change that situation.

CHAPTER 1
INTRODUCTION AND OVERVIEW

1.1 Introduction

To date, industrialization is widely regarded as an inevitable development path for developing countries seeking to create a modern economy with high living standards, and even is treated as synonymous with the concept of development (e.g. Gillis et al. 1996). A late industrializing country only achieves industrialization and catch up with the advanced countries by successfully moving up the ladder of comparative advantages, from cheap natural resources and low-skilled labour to the use of skilled, well-trained labour, advanced technologies and knowledge. The in-depth nature of sustainable industrial development thereby is the creation of dynamic comparative advantages or the upgrading of manufacturing competitiveness, which has been theoretically and empirically shown to be the most critical determinant for successful industrialization (Porter 1990; Lall 1990, 1996, 2003; Meir 1995; Shafaeddin 2005). A higher level of competitiveness in manufacturing is also a principal criterion for distinguishing different stages of industrialization across countries or within a given country.

Developing countries have a similar objective with respect to the desire to pursue industrialization, but differ greatly in terms of their success in achieving this goal. The reasons for very uneven levels of manufacturing competitiveness and industrial development remain a central subject in the vast literature on economic development. Climbing to higher levels on the competitiveness ladder in the context of the rapidly globalizing world economy generates greater opportunities from participation in a larger market, with greater access to capital and to advanced technology, but also requires facing the challenges posed by more intense competition, especially for small and medium firms. A growing number of studies on the relationship between economic

globalization and competitiveness have focused on this balance between opportunities and risks, but chiefly in terms of national level issues for industrialized countries.

Vietnam is a late industrializing country and her industrial output and exports have increased quite rapidly since industrialization began to occur within a newly opened economy after 1986. Despite such growth, the scale of Vietnamese manufacturing is still small and average productivity is relatively low compared to those of the second-tier NICs in South East Asia. This manufacturing development level is substantially responsible for Vietnam's low gross domestic production (GDP) per capita, around US$720 by 2005, still approximately one half of that of the Philippines or Indonesia and ranked seventh among the ten countries of the Association of South East Asian Nations (ASEAN). Vietnam remains a pre-industrialized economy according to the classifications of development economics scholars and of world economic organizations and forums, including the United Nations Industrial Development Organization (UNIDO) and the World Bank (WB). Nonetheless, the Vietnamese economy has been undergoing rapid regional and international economic liberalization, with virtually all tariff lines reduced to 0-3 percent within AFTA in 2006 and with the implementation of the World Trade Organization (WTO) rules commencing in 2007. To catch-up with earlier industrializing countries in the region and to graduate as an industrialized country by 2020, as outlined in the official 2001-2010 socio-economic strategy, Vietnam's policy makers need to devise more effective industrial policies.

1.2 Research objectives and scope

Given the context of the Vietnamese economy stated above, it is essential for an industrializing country to obtain more profound knowledge on industrialization, on manufacturing competitiveness and on the appropriate industry policies within an environment of liberalized trade and capital flows. These requirements appear more necessary for Vietnam than other countries, for a number of high-level national decision-makers still retain perspectives and performance standards drawn from the period of the planned economy. To contribute to this improved knowledge base, the objectives of this thesis are as follows:

- To provide a systematic review of the key concepts and of the factors affecting competitiveness at the firm, industry and national levels.
- To identify those policies most likely to strengthen manufacturing competitiveness in late industrializing economies, in particular under the WTO regime, based on a review of the theories and experiences of Japan and of the first-tier and second-tier newly industrialized countries (NICs).
- To analyse growth and structural change within the manufacturing sector in Vietnam, in terms of firm size, firm ownership and industry structure, during the 20-year period of economic renovation (1986-2005).
- To evaluate key trends in manufacturing competitiveness in Vietnam relative to comparable regional economies, at the firm, industry and national level.
- To undertake a preliminary empirical examination of how and to what extent the key market determinants of competitiveness, both traditional factors and newer, more knowledge-based determinants, have had an impact on Vietnam's competitiveness.
- To analyse the evolution of, and assess the effectiveness of, industrial policies in building manufacturing competitiveness in Vietnam (1986-2005) and to draw lessons for future government targets and policies.

Given the complexity of these issues, there are a wide range of potential determinants of manufacturing competitiveness. This study focuses on what are taken to be the most fundamental factors, namely embodied and disembodied technology, labour costs, research and development (R&D), firm ownership (including the role of foreign direct investment (FDI)), firm size and exports, as well as the corresponding government policies.

The countries used as comparators with Vietnam are four other South East Asian countries, namely Malaysia, Thailand, Indonesia, Philippines. The countries used as comparators with Vietnam are four other South East Asian countries, namely Malaysia, Thailand, Indonesia, Philippines. These countries are selected since, of the ten ASEAN countries, they are most comparable to Vietnam in terms of geographic features and Vietnam has objectives of economic development and manufacturing productivity to catch-up with these regional countries.

Up to the present, there have been few studies of Vietnamese industrialization within an economy in transition from a centrally-planned economy to a more market-oriented one. The studies that have been undertaken have failed to adequately analyse manufacturing competitiveness, which is widely recognised as a vital component for successful industrialization within an economy facing the new challenges from regionalization and globalization. This thesis is distinguished from other studies on industrialization and the Vietnamese economy in the following ways, among others:

- It places the empirical analysis within the context of a systematic review of the literature on industrialization issues, on types of competitive advantage and of competitiveness drivers and determinants, as well as of industrial policies and their effectiveness in terms of strengthening competitiveness and accelerating industrialization. This policy review includes a detailed analysis of the policies adopted in Vietnam since 1986.
- It uses for the empirical analysis, to our knowledge for the first time on these issues, a database on the full population of manufacturing firms in Vietnam (over 20,000 manufacturing firms by 2005) constructed within the Vietnamese General Statistics Office (GSO) since 2000, with financial and technical assistance from UNIDO and the World Bank since 2000. This database is used, in conjunction with UNIDO datasets, to analyse competitiveness in Vietnam at the firm, industry and national levels. The research will be the first analysis of manufacturing competitiveness in Vietnam using value-added and total factor productivity as more sophisticated indicators.
- The study will also be the first for Vietnam to use econometric models to assess the extent to which market and globalization factors have impacted on competitiveness in Vietnam, and to use such models to analyse the effectiveness of industrial policies on manufacturing competitiveness in Vietnam.

1.3 Outline and the main findings of the thesis

Chapter Two – Industrialization: Theory and practice in late industrializing countries

Chapter Two reviews and generalizes the theories on industrialization and the experiences of Japan, NICs and second next-tier NICs in South East Asia. Despite its important role for development, industrialization and even de-industrialization has occurred at varying rates between countries around the world, especially over the last three decades. The late industrializing economies have important advantages in terms of access to foreign technology, skills and capital compared to the earlier industrializing nations, and therefore have the possibility of catching up by shifting to new, high-order comparative advantages or by moving up on the ladder of manufacturing competitiveness. However, whether and to what extent that potential may be actualized in reality depends initially on the selection of a sophisticated combination of the two chief strategies of industrialization, export promotion and import substitution. Carrying out the selected strategy in turn requires upgrading technology capacity, training capable engineers and managers, and strengthening key organizations and firms. The experiences of NICs in Asia and in Latin America have illustrated these propositions. Increasing globalization and the increased role of WTO commitments are seen as providing both opportunities and challenges for industrializing countries. But more detailed studies on this very important theme are clearly needed.

The most critical identified factor is creating dynamic comparative advantages or upgrading the manufacturing competitiveness base through which an economy is able to make substantial progress in achieving the objectives of each industrialization stage, as occurred in the East Asian NICs. This competitiveness base is emphasized as the most decisive factor for later industrializing economies such as Vietnam, in particular in the context of globalization, trade liberalisation and the commitments incurred after joining the WTO.

Chapter Three – Literature review and analysis of manufacturing competitiveness

Chapter Three systematizes and critically reviews the theoretical issues on manufacturing competitiveness, examining different definitions and categories of determinants at all levels. The review places emphasis on distinguishing new competitive advantages based on technology capacity and high productivity from the traditional comparative advantages based on available, cheap natural resources and low-skilled labour. The market determinants of competitiveness are classified and systematized in terms of the supply and demand sides, at firm, industry and national levels and in terms of those that are readily available and those that are difficult to acquire, requiring sustained policy actions.

Competitiveness in general and manufacturing competitiveness in particular are important, diffuse and multi-level concepts. The disputes still largely remain at the national level but tend to converge at other levels in terms of the components of a definition, the performance objective and determinants. Competitiveness can be categorized into numerous forms and is thereby influenced by numerous factors from both the supply and demand side. Each level is characterized by certain determinants.

The decisive determinants for creating manufacturing competitiveness are technology capacity, a well-trained labour force and strong firm organization, being nationally-owned large firms, multi-national corporations (MNCs) or networking between domestic small and medium-sized enterprises (SMEs) and MNCs. Domestic technology learning and R&D efforts, either in firms or through linkages between firms and universities, have proven to be crucial factors for the success of industrial development in the long term. To benchmark the competitiveness of a given firm type or industry, or of the whole of manufacturing, economists use a number of indices based on various models or formulas which depend on the selected definition of competitiveness. If competitiveness is defined as an ability of a firm or industry to compete in the international market, the corresponding indicators are market share, export growth or revealed comparative advantage. If competitiveness is seen as a broadly based systemic capability, linked in the long term to sustainable standards of living, the indicator widely agreed as the most important is productivity, which comprises labour productivity, cost productivity or cost efficiency and total factor productivity (TFP).

However, being a performance indicator, it can be combined with others that are driving factors for overall competitiveness indices as designed by the largest international economic organizations.

Chapter Four – Policy for creating manufacturing competitiveness: Theory and practice in the newly industrialized countries

Chapter Four supplements the critical review on the determinants of competitiveness in Chapter Three by summarizing both the theories and the empirical evidence justifying government industrial polices for upgrading manufacturing competitiveness and implementing the process of industrialization. The opposing views of the main schools of thought are presented, with emphasis on the conditions for successfully applying government policies. Industrial policy is categorised by type and by the relevant objectives and instruments at each level. An attempt is made to understand the concrete industrial policy instruments, at each level, that were effectively applied in each stage of industrialization in the East Asian NICs and the second-tier NICs in South East Asia.

Whereas there has continued to be dispute on the role of industrial policy for industrialization, the concept of industrial policy itself has gradually evolved, and become clarified and well classified. A wide variety of policy approaches and instruments, which nevertheless have certain commonalities, have been applied through industrialization, but needed to be subject to change to appropriately respond to each level of manufacturing competitiveness and at each respective stage of industrialization. Generic industrial policy is widely accepted and implemented, and can be applied under WTO commitments. Selective or specific industrial policy was significantly applied in three of four 'tiger' economies, which all had competent, disciplined and relatively incorrupt bureaucracies. These countries achieved strong manufacturing technological capacity and the highest level among latecomers on the competitiveness ladder, as well as achieving the most rapid pace of industrialization. For industrial development, the second-tier NICs implemented policies which were less diversified, more generic and more dependent on FDI, but which had a lower level of effectiveness than those devised and implemented by the first NICs. The reasons for these disparities are rooted not only in differences between the two groups in history and culture but also in the competence and management ethics of the bureaucracy.

Chapter Five – Analysing manufacturing competitiveness and industrial policy effectiveness in Vietnam: Conceptual framework and methodology

Having laid the theoretical foundations in the previous chapters, Chapter Five provides the details of the conceptual framework and methodology to be used for analysing Vietnam's manufacturing competitiveness. This includes the specification of definitions, supply-side and demand-side market drivers, government policies, and single and overall indicators for assessing competitiveness performance at the firm, industry and national level. The comparative and econometric methodologies to be used are also outlined.

Four types of empirical analysis are undertaken in this thesis in relation to manufacturing competitiveness in Vietnam and in the other countries of the ASEAN-4:

(i) measuring different aspects of manufacturing competitiveness in Vietnam;
(ii) analysing the impact of the level and quality of production factors, such as capital, labour and R&D, on overall total factor productivity levels;
(iii) extending this analysis to compare productivity levels, and the role of different determinants of those levels, in Vietnam with those of the other countries of the ASEAN-4; and
(iv) analysing the effect of various policy measures on manufacturing competitiveness in Vietnam.

To undertake these tasks three related methodologies drawn from the literature are used. First, index number methods are used to carry out task (i); these methods are outlined in Section 5.1 of Chapter Five. Secondly, factor analysis methods, including regression analysis based on an extended production function framework, are used to address tasks (ii) and (iii) (see Section 5.2 of Chapter Five). Thirdly, methods based on the neo-classical growth model are used to test the effect of various government policies on productivity growth (see Section 5.3 of Chapter Five).

A number of econometric models are presented to evaluate the degrees to which market determinants and several main government policies impacted on various measures of competitiveness. The dependent variable is one of labour productivity, economic

efficiency or total factor productivity. The independent variables include alternative combinations of fixed capital per employee, the wage level, the technology level, personal computer use, R &D expenditure, firm size, government financial incentives in the form of enterprise income tax and tariffs.

Chapter Six – Firm-level manufacturing competitiveness by size

Chapters Six and Seven are devoted to analysing manufacturing competitiveness in Vietnam at the firm level, as this is the basic level of any economy or manufacturing sector. Chapter Six assesses and compares firm competitiveness by size, using the data and methods noted above. The analysis reveals, for the first time to our knowledge, a complex and interesting picture of the role of firm size in the structure and growth of Vietnamese manufacturing. Some of the key findings are as follows:

(i) *Distribution by firm size.* Over the period 2000-05 there has been rapid growth in the number of SMEs in Vietnam, but that trend to SMEs is not so pronounced for key input and output variables. Both total fixed capital and the number of employees grew somewhat faster for SMEs, but value added continued to grow more rapidly in larger firms.

(ii) *Patterns of capital intensity and of other production factors.* Contrary to normal thinking, capital intensity (measured by real fixed capital per employee) showed a bell-shaped curve across the size distribution. The most capital intensive firms were in the middle of the size distribution (those with 50-1000 employees), while the larger firms were less capital intensive by this measure. In both cases these levels were below that of SMEs as a whole. Thus one critical feature of Vietnam's industrial structure appears to be relatively low capital intensity, on average, among the largest firms, where firm size is measured by the number of employees. A similar pattern is evident in some other important inputs to production. In 2002 the ratio of R&D to total sales was highest in firms with 300-999 employees, and significantly below the overall average in both larger and smaller firms. Use of PCs (not networked) per employee showed much the same pattern, while use of networked PCs per employee declined steadily with firm size.

(iii) *Industry distribution by firm size.* These differences reflect in part, the types of industries in which firms of different size are engaged. A high proportion of

large enterprises, and especially of the largest firms, are in labour intensive industries, such as food, beverage and garment production, whereas SMEs have a much higher share in resource-intensive industries (such as chemicals and metal fabrication). In contrast only a small proportion of the largest firms are in capital intensive industries, such as automobiles and furniture manufacture.

(iv) *Labour productivity.* The productivity of labour (real value added per employee) is heavily influenced by the level of capital per worker, and also shows a bell-shaped curve with firm size. The firms with the highest level of labour productivity in 2005 are those with 200-999 employees, and productivity in both larger and smaller firms is below the all-firm average. Again the largest firms had labour productivity of only about one half of the average in 2005, and productivity growth in these firms for the period 2000-05 was lower than in any other size grouping.

(v) *Total factor productivity and overall competitiveness.* TFP and overall competitiveness increased virtually consistently with firm size in both 2000 and 2005, if firm size is measured by capital. But this is true only for most firm sizes, except firms employing between 300 and 500 workers and the largest with at least 5000 employees, in the case in which firm size measure is by the number of employees.

(vi) *Competitiveness levels by capital size measures.* The conclusions above mainly relate to firm size as measured by number of employees. Some important differences are found if the data are analysed in terms of firm size defined by total capital. Labour productivity had a bell-shape distribution if firm size is measured by number of employees, but these increased strongly uniformly with firm size if a capital measure is used. Wage competitiveness and capital productivity had opposite distributional patterns for the two firm size measures. On the basis of the capital measure, competitiveness markedly increased with firm size for virtually all competitiveness indicators, except capital productivity.

(vii) *Different results delivered from four single competitiveness indices and firm size measures.* On the basis of an individual competitiveness index, the competitiveness results differ significantly between two firm size measures. Also by a given firm size measure, the distribution patterns vary between

competitiveness indices and were even opposite for capital productivity and wage competitiveness. Theoretically, these results suggest that to assess the relative competitiveness of firm across different size categories, in particular within an industrializing economy, one should use more comprehensive indicators and take into account different firm size measures.

Chapter Seven – Firm-level manufacturing competitiveness by ownership

Chapter Seven deals with competitiveness of firms categorised by ownership and size combined with ownership. Some of the main findings are summarised below.

(i) *Major structural changes by ownership type.* During the twenty years of economic reform in Vietnam since 1986, the number of firms in virtually all firm ownership types within the manufacturing sector grew steadily. The highest annual average rate of growth in firm numbers was for foreign investment enterprises (FIEs) over the period 1990-2000 and for non-SOEs between 2000 and 2005. As a result, the composition of the manufacturing sector by ownership changed very dramatically and profoundly, driven by two opposing changes. The SOE sector moved from being the dominant one to being the smallest in these terms, while FIEs rose from being excluded before 1988 to being the largest within only ten years. Non-SOEs shifted from being a sector discriminated against to being larger than the SOE sector. Simultaneously, at a more detailed level, wholly-owned FIEs replaced central SOEs as the largest firm ownership type in terms of all input and output indicators.

(ii) *Marked differences in competitiveness levels by ownership type.* With respect to fixed assets, value-added per wage unit, information and communication technology (ICT) and R&D activities as the sources of competitiveness, the most competitive firm type was joint-ventures with SOEs and the least competitive was private-limited enterprises. R&D activities were very weak for collective, private and joint ventures with non-SOEs. There was a considerable equipment gap between foreign and locally-owned firms, but over time the central SOEs narrowed this gap substantially and invested most on R&D. While a significant disparity between joint-venture with SOEs as the highest

and collective and private enterprises as the lowest in term of most indicators, this position was reversed for capital productivity. Central SOEs came in second or third by labour productivity, TFP and overall competitiveness, while local SOEs were second in term of total cost efficiency. These results provided reason to cast doubt on the popular opinion that SOEs had very low efficiency and that privatization was a mainstream solution to deal with the failures of this type of firm ownership.

(iii) *Different results for different competitiveness measures.* For non-SOEs, both joint-stock ownership types performed most strongly, suggesting the further development of this firm type in the coming years. Private limited enterprises, the most common form and the second largest in term of employees were below the medium level by all indicators. Collective and private enterprises had opposite rank depending on competitiveness indicators, being the weakest by labour productivity and TFP but the strongest by capital productivity and second by wage competitiveness. These results again emphasize that, as with firm size, to evaluate and interpret firm-level competitiveness it is essential to highlight specific measures or indicators to avoid misleading conclusions. Similarly, relative competitiveness levels between ownership types also varied substantially depending on the industry in which firms operated.

(iv) *Sharp divergence between different forms of foreign involvement.* The results of this chapter also contribute to enrich knowledge on different characteristics of the two forms of foreign involvement in Vietnam, joint-ventures with SOEs or wholly FIEs. It is shown that over the five years 2000-05 wholly FIEs became the largest firm ownership type within the manufacturing sector but both its competitiveness drivers and its performance rapidly degraded, implying the unsustainability of current patterns of growth in Vietnamese manufacturing if these trends are not reversed.

(v) *Competitiveness largely driven by traditional factors.* The correlation and regression results confirmed that the competitiveness of different manufacturing sectors and firm ownership types in Vietnam still largely rely on the quantity of traditional factors rather than on new technology and R&D activities. The findings also implied a strong positive impact of more knowledge-intensive inputs on firm competitiveness by all measures.

Chapter Eight – Industry- and national-level manufacturing competitiveness

Chapter Eight analyses Vietnam's manufacturing competitiveness (MC) at a higher level, started with assessing the growth of three main industry groups as well as all two-digit industries, analysing the structural change in the manufacturing sector by industry over the period since the new industrialization strategy for an open, market economy was launched. Some of the key findings are as follows:

(i) *Strong structural change in Vietnam, but still behind the ASEAN-4.* During the twenty years since the launch of economic reform and open policy in 1986, there was rapid growth and considerable structural transformation of manufacturing in Vietnam toward the structure of the industrialized economies. The major share in total inputs and outputs shifted from the basic-goods, labour-intensive group of industries to the capital-goods, high-technology group, approaching the proportion of Indonesia by 2005. Nevertheless the manufacturing structure in Vietnam by industry still lagged all of the ASEAN-4, owing to the lower share of the intermediate-goods group and the considerably higher share of the basic-goods and low-technology group. The proportion of the high-tech group in total gross output or value-added was still around ten years behind that of Thailand and Malaysia, which are respectively middle and middle-high income, or industrializing and industrialized countries.

(ii) *Lower competitiveness in Vietnam across most indicators and industry groups.* The growth and structural change of Vietnamese manufacturing was certainly evident in the rapid rise in labour and wage productivity, as well as total factor productivity, for all groups and industries. This was partly due to the very low initial level of Vietnam productivity and therefore, despite the rapid growth of all productivity indicators on average, all groups, and most of the two-digit and three-digit level industries had lower competitiveness levels than those of all the countries of ASEAN-4.

(iii) *Lower competitiveness reflects disadvantages in most determinants*. The lower competitiveness levels of Vietnamese manufacturing as compared to the ASEAN-4 was explained by Vietnam's evident disadvantages in all underlying competitiveness determinants, including both quantitative and qualitative production factors. For example, lower levels of cost competitiveness and TFP or qualitative factors such as disembodied technology, institutions and skill

management were tentatively identified as the reasons for Vietnam lagging in competitiveness with respect to the Philippines and Thailand.

(iv) *Theoretically, the analysis of manufacturing competitiveness (MC) at industry- and national-level provides a valuable supplement to that work at firm-level, revealing more substantially the level of international MC of an economy.* In the case of Vietnam, as compared to only four comparable regional economies at industry and national level, Vietnam's MC was lower on most of the single indices and on the overall index. While on the basis of firm-level analysis, the MC of Vietnam firms appeared to be stronger than that of foreign firms, since wholly foreign-owned enterprises stood at the medium-level in the competitiveness ladder of manufacturing enterprises.

These findings provide evidence that Vietnam's upgrading of its manufacturing competitiveness was relatively rapid over the 1998-2005 period in its own right, but was not faster than comparable regional economies, so that Vietnam has to find out more effective, breaking solutions in order to catch up with its neighbours.

Chapter Nine – Vietnam government policies for strengthening manufacturing competitiveness: Evolution, characteristics and effectiveness

Chapter Nine completes the analysis of the main factors affecting competitiveness in the manufacturing sector in Vietnam by examining the evolution of government strategies and policies for industrial development over different time periods.

Since the economic reform started in 1986, the political system and the Vietnamese government have made fundamental changes in approaches and methods of outlining industrialization strategy and of making industrial policies. At national and industry levels these consisted of combining the promotion of the export-oriented industries and the protection of selected import-substituting industries. At the firm level, the plans and programs aimed at attracting FIEs and encouraging new locally-owned firms as well as restructuring and strengthening SOEs. Whereas the policy-making procedure had been still largely influenced by government bureaucrats, the participation of different groups of people, entrepreneurs via Parliament, the Chamber of Commerce and Industry and professional associations has also been increased.

The Vietnam government set numerous detailed policy tasks and instruments to achieve the industrialization goals outlined by the Vietnam Communist Party (VCP) in each period of time. These policies evolved from being discriminate and specific to being more uniform and functional. The policy approaches, goals and instruments targeting different types of firm ownership became relatively diverse, being more responsive to the needs of each type of firm. As a result, the policies had considerable effectiveness in encouraging FIEs to export, in encouraging non-SOEs to increase employment, to utilize domestic capital and to increase production of various manufacturing commodities. Our initial empirical analysis suggests that incentives provided through enterprise income tax had a strong positive impact, but that tariff policy seemed to be ineffective.

In spite of these successes, there existed a number of restraints in the policy-making mechanisms, which in turn were not capable of overcoming several challenges in manufacturing development. Despite numerous measures implemented over a relatively long time to raise efficiency in and strengthen SOEs, these enterprises, and especially government corporations (GCs), still performed below expectations. In addition, policy did not succeed in inducing FIEs to invest more on higher technology activities, with the increased FIEs activity – most of their labour and nearly a half of their capital – being in labour-intensive, low-technology industries. Those operating in medium and high technology industries were still largely in the low value-added, assembly stage of the MNCs global chain. This helps to explain why the labour productivity gap between Vietnam and the second generation NICs had not been much reduced, and has even widened in several high-tech industries.

The analysis above of the conditions for receiving special priority treatment from government implied that it is most likely that enterprises would choose to invest in the labour-intensive, low-technology and export-oriented industries or stages in the global manufacturing value-added chain. The policies allowed them to utilize efficiently a pool of cheap labour rather than making efforts to apply new, advanced technologies. The latter has proved difficult, costly and risky in developing countries, and the experience of the first NICs suggests that comprehensive, effective government policy measures are required.

Since 2006 the Vietnamese government has made policy adjustments to shift from encouraging export oriented labour-intensive industries to emphasizing more the development of intermediate and capital goods industries, making use of more advanced technologies. This reflects the move to the second stage of industrialization in Vietnam and is highly significant, promising new policies for strengthening Vietnam's manufacturing sector. Nonetheless, more detailed, effective industrial policy measures need to be created if the goal of becoming an industrialized country by the year 2020 is to be achieved as planned.

CHAPTER 2
INDUSTRIALIZATION: THEORY AND PRACTICE IN LATE INDUSTRIALIZING COUNTRIES

2.1 Introduction

To date, industrialization has been widely regarded as a necessary development path for developing countries, and has often been treated as synonymous with development (Gillis et al. 1996). Developing countries are similar in respect of the desire to pursue industrialization, but are very different in terms of their success in achieving this objective. The reasons for significant differences in the level of industrial development remain the subject of a vast literature in the theory and practice of economic development. The objective of this chapter is to review some of the main theoretical and empirical studies on industrialization. The analysis is carried out in terms of, and the chapter is organized into three major themes:

- the degrees of industrialization, and the corresponding criteria for classifying stages of industrialization;
- the pace, nature, and key determinants of industrialization; and
- the impact of intensifying globalization on industrialization.

2.2 Fundamental concepts of industrialization and the role of manufacturing

2.2.1 Structural change, industrialization and de-industrialization

Industrialization is commonly regarded as the process in which a developing economy's productive resources move to the industrial sector, leading to more rapid growth of industry and manufacturing value-added than of GDP. Structural change, in terms of an increasing share of manufacturing in GDP, is accordingly the major characteristic of industrialization. According to Chenery et al. (1986) this process is both caused by and accompanied by sets of other structural transformations in demand, production factors and trade, which can also be regarded as features of industrialization. Due to rising

income, structural change takes place in demand, with a relative reduction in the demand for primary products and a shift to products that require inputs of intermediate goods and technologies. This in turn results in a shift in production factors from the agricultural to the industrial and manufacturing sectors, together with a rise in imports of intermediate and finished goods. Structural change may also occur within manufacturing value-added, with the shift from light, low-tech products to heavy, medium-tech ones (Weiss 2002).

Other development economists have also emphasized that a fundamental feature of industrialization is the increasing share of manufactures, especially goods which are intensive in capital, skill and technology, in total industrial value. According to Kirkpatrick (1987), an industrializing economy's structural change takes place most rapidly during the development of heavy, capital-intensive industries. Given such advanced products, the transformation of manufacturing structure contributes significantly to the rise in productivity of both manufacturing and the economy as a whole (Chenery and Sysquin 1986).

As indicated in many theoretical and empirical studies, including the empirical testing using panel data of Kaldor's three laws of industrial growth (Kaldor 1966, 1967, cited in Thirlwall 2006), manufacturing has played the leading role for growth and development in many countries. According to each of these laws, manufacturing growth has strong relationship with three other variables: economic growth, manufacturing productivity and productivity in other sectors. This helps to explain the fact that, even in advanced economies where manufacturing accounts for only around 15 percent of GDP, this sector continues to play a pivotal role, as its productivity influences that of other sectors (Xue and Sheehan 2002).

Another recent trend has been a growing convergence of the manufacturing and service sectors, which in turn is reflected in a new concept of manufacturing. Modern manufacturing is not an isolated production process, transforming outputs to inputs in physical form, but is enhanced by and vitally linked with the service sectors (Houghton et al. 2002). However, there are only limited studies on the nature of services that are closely linked to manufacturing, and on the extent in value terms of that integration. Further, the concept of such a 'new manufacturing' has mainly been analysed in theory,

and has not been represented in statistics nor used in empirical analysis on manufacturing.

The last three decades of the 20th Century saw a number of countries in East Asia – namely South Korea, Taiwan, Singapore and Hong Kong – escaping rapidly from low income levels, shifting from the low-income group to the high-income group of countries through a remarkably successful industrialization. These economies were initially termed 'semi-industrialized' (Hughes 1980), and then were described as 'newly industrializing countries' by several Western authors or as 'high-performing economies' by the World Bank (World Bank 1993). More recently the more popular term has become the 'newly-industrialized countries' (NICs). Following the industrialization paths of these four 'tigers', other economies such as Malaysia, Thailand, Indonesia in South East Asia and China also emerged as high-performing or the second-tier NICs, although overall their economic and industrial growth rates were somewhat less impressive.

In contrast, over the same period de-industrialization, which is defined as the relative reduction of manufacturing value-added in GDP, occurred in a number of the least developed countries as well as in the most developed countries. However, the nature, reasons and directions of such change were contrasting between these two groups. Most of the de-industrialization in developing countries took place in Latin America and in the middle and south of Africa, where manufacturing production decreased in both absolute and relative terms (Weiss 2002). In most of the Western developed economies the industrial share in GDP as percentage reached the peak of around 30-40 percent, but has subsequently declined significantly (Thirlwall 2006). This process reflects the rise of the service sector, in part relying on high skills and knowledge, which now accounts for around 75 percent of GDP in the US and 71 percent of GDP in Australia (World Bank, 2004).

2.2.2 Level and pace of industrialization

2.2.2.1 Industrialized, semi-industrialized and industrializing countries

Despite the importance of industrialization in development, the term 'industrialized country' remains somewhat ambiguous due to the lack of widely agreed criteria or an agreed set of indicators on which to classify countries as industrialized. Theoretically, based on the earlier discussion of the key place of structural change of industrialization, the main questions that arise are what percentage manufacturing share in GDP is regarded as an appropriate threshold to rank an economy as industrialized, and whether there should be additional criteria.

Numerous studies on industrialization suggest that a country should be classified as industrialized on the basis of two fundamental threshold conditions: the share of manufacturing in GDP and the level of income per capita. But many other criteria have also been used. Sutcliffe (1971, cited in Weiss 2002), for example, proposed a set of criteria including a share of the industrial sector in GDP above 20 percent, a share of manufacturing in industrial value-added above 60 percent and more than 10 percent of the population employed within the industrial sector.

On the basis of such criteria, Hughes (1980) classified countries in the world into the four levels of non-industrial, industrializing, semi-industrialized and industrialized. The first consists of a small number of countries in southern Africa, the Pacific and South Asia where manufacturing activities were very limited. The second is comprised of countries with 20 to 40 percent of industrial share in GDP, constituting the majority of countries in South and South East Asia, Latin America and North Africa. The third consists of those with a 40 to 60 percent share of industry including four Latin American countries, China and Malaysia. The last level consists of those having a share of manufacturing in total industrial value-added around 60 percent, such as the US, Canada, Western and Eastern Europe, New Zealand, and the four East Asian tigers.

On the basis of a wide range of empirical evidence, Chenery and Syrquin (1986) divided growth and development into three stages: the primary commodity stage, the semi-industrial stage and the advanced economy stage. Semi-industrial countries, which

have accomplished mainly industrialization but have not yet moved to the advanced economy stage, are defined as those achieving two objectives, a share of manufacturing in GDP of 30-40 percent and income per capita above US$1000.

Nonetheless, according to Hughes (1980), the criteria emphasizing the manufacturing share in GDP did not cover a few countries like Australia and Canada, that had a mature industrial structure but with manufacturing accounting for below 60 percent of industry since the mining share was relatively high. On the contrary, in some countries like Brazil and Argentina manufacturing accounted for nearly 60 percent of industry but value-added per employee or income per unit of capital was relatively low. According to the World Bank (2000), the manufacturing proportion was likely lower, around 20 to 30 percent. Weiss (2002) also noted that there are several economies having an industrial sector share of GDP greater than that of the advanced countries but, with the exception of four East Asians tigers, manufacturing value-added per capita remained significantly lower than in the advanced countries.

These cases provide justification for using income per capita as a sufficient condition for being classified as an industrialized country. The World Bank and UNIDO (1976) placed three of the first-tier East Asian NICs, except Korea, into the industrialized group when the income per capita and manufacturing value-added per capita in each country reached at least US$1000 and US$400 correspondingly in 1976. However, Chenery and Syrquin (1986) defined industrialized or advanced countries as those achieving a threshold income per capita of US$2000. Taking account of annual inflation rate, this threshold is equivalent to around$ US$4000 at the present time.

In short, there is still no consensus about either the criteria or the exact thresholds that should be used to rank an economy as an industrialized one. In addition, virtually no studies on industrialization have used manufacturing productivity as a principal criterion, even though this might be seen as a direct indicator of industrial development. Thereby, from the perspectives of a number of authors, the highly performing economies of ASEAN – including Malaysia, Thailand and Indonesia – were ranked as the second-tier NICs, and hence as industrializing rather than industrialized. The first country might well be recognized as industrialized since it meets both the

manufacturing share of GDP and the income per capita conditions, but it and the others mentioned are still regarded as industrializing by some economists.

2.2.2.2 The pace and duration of industrialization

In the history of industrialization over the World, there have been sharp differences in the time within which a backward country has been transformed successfully to an industrialized one. The first NICs completed the key structural transformation from being dominated by light industry to heavy, technology-intensive industry after only about 15 years, which was substantially shorter than the time of about 25 years taken by Japan and of about 50 years taken by Britain (Wade 1990). Gerschenkron (1962) proposed that there was a law of industrialization and the catch-up process of the late industrializing countries, stating that the later a country started industrialization the shorter time it required to catch up.

Shin (1996), Amsden (2001), Hu (2002) explained Gerschenkron's propositions about the time perspective in industrialization and technological development via three fundamental reasons. First, latecomers can acquire modern technologies that have been created and commercialized within the industrialized countries, and are thus able shorten the time for, and reduce the cost of, innovation. Second, late-industrializing countries have the advantages of the learning experiences of earlier countries, so that they can avoid failures and select the optimal elements of their industrialization strategies and policies, again thereby shortening the duration of the process. Third, the motivation for industrialization of more backward countries is stronger than that of the pioneers, as the benefits of industrialization can be clearly seen. The evidence of the industrialization process of a number of countries from the mid-1960s to the beginning of the 1980s seems to confirm these arguments.

However, Shafaeddin (2005) identified several greater difficulties of implementing industrialization for the later-comers. For one thing, they have to face more concentrated world market structure in which very large firms of industrialized economies exercise strategic activities, making it difficult for late industrializing firms to overcome entry barriers and reach the international level. For another, "the later a

country begins to industrialize, the shorter time span available for temporary infant industry protection and for attaining international competitiveness..." (p. 165).

Industrialization duration of the later comers' thereby has varied significantly, depending on the extent they succeeded in utilizing advantages and overcoming disadvantages of late industrialization A number of studies on economic history and development have pointed out that several Latin American countries started this process before the 1930s, more than two decades earlier than the East Asian NICs. But in the 1980s the former were surpassed by the latter in terms of most of the critical indicators of industrialization. Different time periods have also emerged between the first and second-tier NICs in East and South East Asia, in spite of the similarities in geopolitical status and industrial development level in the two groups in the 1960s. As the result of more impressive annual manufacturing growth rates, the East Asian 'tigers' graduated as industrialized at least a decade earlier than Malaysia, and nearly two decades earlier than the other countries in the latter group.

2.3 Stages and strategies of industrialization

2.3.1 Creating new comparative advantages and relevant stages of industrialization

As defined earlier, industrialization involves increasing manufacturing production in both absolute and relative terms. This process is characterized by a strict connection with international trade, even for countries having a large domestic market, due to the benefits from trade. The initial comparative advantages of the latecomers relied on the lower opportunity cost of primary goods sold by them in the international market (Krugman 2006). However, based on the different features of market structure for latecomers and those industrializing earlier, Prebisch (1950, cited in Weiss 2002) predicted a trend of the declining terms of trade for primary goods relative to manufactured goods. That is, a relative decrease in prices of primary goods exported from the former compared to that of manufacturing commodities exported from the latter over the long term. As a result, the author suggested that an industrializing country has to create new comparative advantages within manufacturing to sustain its own industrial development.

Prebisch's prediction was later shown to be theoretically and empirically relevant, and could be extended to explaining the declining terms of trade for labor-intensive goods compared to capital, and skill-intensive commodities (Weiss 2002). Weiss also noted that Prebisch's case was compatible with the neoclassical view, which also implied declining relative prices for primary products compared to manufactured ones. This was justified by higher growth in both the productivity of, and demand for manufactures as compared to primary commodities. Graphically, these changes are demonstrated by shifting the supply as well as the demand curve of the former toward the right more than for the latter. As a result, the prices of manufactures would be higher than the primary goods.

Similarly, as mentioned earlier, the structuralists identified the relative reduction in demand of primary goods as one of the types of structural transformation common to industrialization, causing the decline in relative prices of such goods (Chenery, Robinson and Syrquin 1986).[1] The necessity of changing comparative advantages for countries was also justified by Meier (1995), based on the theory of product life cycles. The author argued that as a new product was innovated in more industrialized countries it would, given trade, be imitated and produced in an industrializing country, leading to the transfer of comparative advantage induced by those products from the former to the latter. To keep ahead on international competitiveness, the former need to find new comparative advantages that are in turn based on new rather than traditional factors.

Similarly, it is widely recognized by development economists (Lall 1990, 1996, 2003; Amsden 2002; Weiss 2002; Shafaeddin 2005) that an industrializing country can only expand and sustain industrial growth if it is able to move up the ladder of comparative advantages, in the direction of industries involving greater intensity of skill, advanced technology and knowledge. In other words, continuous industrial development and successful industrialization requires improving the comparative advantages that are critical determinants of industrialization. Acquiring new forms of comparative advantage can in turn be used as a principal criterion to distinguish different stages of industrialization in a country.

[1] It is recognised that, in recent years, this trend for declining relative terms of trade for primary products has been reversed, as food, energy and commodity prices have risen strongly. However, this trend has been sharply reversed again during 2008, and it remains unclear whether new forces are at work or whether the earlier trend to declining relative primary product prices will be reinstated.

Meier (1995) outlined the stages of dynamic comparative advantage that characterize each of the five stages of industrialization: (i) resource-intensive; (ii) unskilled labor-intensive; (iii) skilled labor-intensive; (iv) capital-intensive and (v) R&D and knowledge-intensive.

2.3.2 Determinants and patterns of industrialization

The fact that developing countries, with similar static comparative advantages and economic structure at the end of 1950s, subsequently implemented industrialization with very different success levels, raises a question about what are critical determinants of industrialization.

The initial, widespread approach to explain the success of East Asian industrialization was formulated in terms of the trade pattern. Numerous studies in development economics, including textbooks, regarded trade regimes as the most fundamental criterion with which to classify all industrialization strategies or patterns into two chief types, industrialization via import substitution (ISI) and industrialization via export promotion (EOI). Gerrefi (1990) used these concepts to divide industrial development into another five phases, this time from the policy viewpoint: first, primary commodity exporting; then four stages of industrialization: the first import-substitution stage, the first export-promotion stage, and second rounds of both import-substitution and export-promotion. In addition to the focus on either export promotion or import substitution, stages were distinguished by the strategic industries that were promoted and by the policy instruments that were used.

The ISI strategy aimed at protecting local manufacturing capacity within strategic industries, so that these local firms can substitute locally produced goods for imported products from industrialized countries. The principal instruments used in the ISI strategy were quantity restriction by quotas and high tariff barriers, to protect the products of promoted domestic industries from import competition from advanced countries.

The targeted industries within the first stage of ISI were normally basic labor-intensive, low-tech strategic industries, while those of the second stage of ISI were capital-intensive, medium-tech industries producing intermediate goods. The first ISI stage was implemented in the majority of developing countries before the 1960s. The second ISI stage was pursued by several ex-socialist countries and by many East Asian countries from the mid-1960s to mid-1970s, but was gradually reduced by the mid-1980s. However this policy was implemented for a longer time in many Latin American and South Asian countries.

Despite different names being used – export-promotion, export-orientation or export-substitution – the purpose of the export oriented industrialization (EOI) strategy was also to develop strategic industries and to upgrade comparative advantages, but it was mainly based on promoting strong export industries. A package of financial incentives – chiefly comprising government direct and indirect subsidies involving credit provision, capital costs, tariff levels and tax rates, as well as the creation and support of export processing zones – were offered to domestic strategic firms conditional upon export performance requirements. These policies were in turn set in a detailed and realistic way, through consultations between firms and governments, so that export goals would be achieved (Amsden 2001). The first stage of EOI began in some East Asian countries in the mid-1960s and the second stage commenced since the mid-1970s.

The first stages of both ISI and of EOI targeted basic, labor-intensive industries, and were assumed to be the "easy" phase since the goal was appropriate to the comparative advantage of economies beginning industrialization. Similarly, the second stages of both ISI and EOI promoted strategic industries producing intermediate goods that were medium-tech, and capital and skill intensive. However, both were regarded as "difficult" stages, due to the complexities of upgrading domestic technological capacity to create new, dynamic comparative advantage. In other words, the later the stage and the higher level of industrialization sought, the more difficult were the goals that needed to be achieved.

There have been three common themes in much of the economic development literature analysing the relationship between trade and industrialization patterns. Firstly, that the two strategies were pursued exclusively to each other, in one country or another in a

given period of time. Secondly, that EOI was the only explanation for the success of East Asian industrialization. Thirdly, that a pure EOI strategy is clearly superior to an ISI strategy. Nevertheless, there have been a growing number of theoretical and empirical studies pointing out that these approaches and arguments were unrealistic and misleading.

Schive (1990) stated that in the short-term a country may select only ISI strategy, for instance Latin America before the 1970s or in East Asia over 1963-1971 for Taiwan and South Korea, due to a negative index of import or high volume of import material and equipments. But as Wade (1990) pointed out, "Taiwan's rapid growth of imports after 1960s does not necessarily signal an import liberalization" (p. 125). For one thing, this was in spite of the fact that the average nominal tariff level was still high at that time, being at 34 percent in 1984. For another thing, the intermediate materials imported were non-competing goods and would be processed for export, and were therefore allowed to be imported at a subsidized price under the ISI policy. In fact, over the medium-term the two strategies were implemented at the same time in many countries, but the extent to which one rather than the other was applied varied sharply between countries.

In the long-term, given the benefits of each approach to trade and development at different levels of industrialization, these two strategies were increasingly regarded as complementary (Gerrefi 1990), but there have been few in-depth theoretical studies about such a complementary relationship. Indeed, it can be argued that a sophisticated strategy, using a mix of EOI combined with a reasonable level of ISI, was the underlying reason for East Asia's remarkable success (Meir 1995). This has been illustrated by comparative studies on the different industrialization strategies that were adopted by the two groups of industrializing countries in Latin America and East Asia, to overcome similar problems (Gerrefi 1990; Weiss 2002; Shafaeddin 2005).

Whereas certain Latin American countries started the first ISI around two decades earlier than the East Asian NICs – in the early 1930s as compared to the 1950s – both encountered problems with the ISI strategy, such as balance of payments problems and dependence on imported manufactures in the late 1950s. To solve similar problems, the former countries continued deepening ISI or moved to the second stage of ISI but the

latter commenced the first stage of EOI as the major response, together with the first stage of ISI.

Again, in the beginning of the 1970s, the Latin American countries encountered more serious balance of payments problems as did the East Asian countires, as a result of reduced comparative advantage based on low-cost labor and the unexpected dramatic success of EOI. The former responded mainly by extending the second ISI stage, in spite of certain attempts to diversify export composition from primary commodity exports to increase manufactured exports. The latter, in contrast, decisively deepened EOI or began the second stage of EOI (Gerrefi 1990), while still applying the second stage of ISI until the mid-1980s. As a result, during ten years (1976-1987) of the second EOI, East Asia's manufacturing production and exports rose very rapidly, significantly changing the structure of the economies with a sharp increase in the share of manufacturing in gross national production (GNP). In the beginning of this period, 1976, GNP per capita of Taiwan and Korea was just 60 percent of that achieved by Argentina and Brazil respectively. But by the end of this ten-year period, 1987, the comparative result was reversed, with GNP per capita in the latter countries now being around 60 percent of that in the former (author calculations from data in Chenery and Syrquin 1986 and Gereffi 1990).

As a result, the more plausible position when comparing EOI and ISI is not that the pure EOI strategy has been shown to be superior to the pure ISI strategy, but that the mixed strategy with a bias towards EOI has been shown to be more successful than that of ISI alone. The earlier a country adopted a change from the exporting of commodities to exporting labor-intensive goods, and the intermediate and capital goods, the faster its manufacturing sector grew and the more rapidly the structural transformation was completed. This explains why the first NICs, except Taiwan, completed their industrialization a decade earlier than the second-tier NICs, since the former started both the first and second stages of EOI nearly a decade earlier than the latter, in the mid-1960s and mid-1970s.

The superiority of EOI in relation to ISI has also remained unproven empirically. While a number of studies (Dollar et al., cited in Weiss 2002) have found that the degree of openness was significantly positively related to long-run income and industrial growth,

Jalilian and Weiss (2000) found that openness was not positively correlated with manufacturing growth.

Based on a rich body of works on economic development and industrialization, Weiss (2002) noted that both neoclassical authors and 'revisionist' authors highly valued local technology learning via adaptation, dissemination and minor and major innovation, but the former viewed public policy interventions as distortions necessarily involving inefficiency. In the face of the proven success of the market-governed model of East Asia, the neoclassical authors did not oppose the model but still underestimate the role of government for industrialization of developing countries (World Bank 1993).

In contrast, the 'development state' focused on the role of principal firm types, large domestic firms and multi-national corporations (MNCs), for upgrading comparative advantages, while emphasizing the role of public policies to overcome the deficiencies of the market within such processes (Wade 1990; Lall 1990, 1996, 2003; Amsden 1989, 2001; Chang 2000; Kim 2003; Wong 2001, 2003). These important factors will be reviewed in the next two chapters.

2.3.3 Commonality and diversity of industrialization strategies in various countries

It is noticeable that, even though some studies such as World Bank (1993) emphasized the common features of industrialization across different countries, the majority of economic development studies stress the diversity of this process. This tendency is useful in terms of providing a "rich menu" for latecomers to select the appropriate elements, but it may also disguise the core models from them.

It can be noted from the theory and experience of industrialization, even within quite different groups of East Asian and Latin American countries, that the overall process has some common features, even if these took place at different levels of development and in different ways across countries. Some common features of the industrialization process include:

- starting with the first stage of ISI and later facing similar constraints, such as balance of payments problems and dependency on foreign manufactures;

- the implementation of mixed strategies between ISI and EOI from the beginning of the 1970s;
- steps to liberalize trade and to seek FDI as an important source of more advanced technology choice since the mid-1980s; and
- some reliance on government assistance and intervention.

The largest identified variations were between two industrialization models, that of the East Asian and the Latin American NICs (Gereffi 1990; Amsden 2001; Weiss 2002). Firstly, the East Asian countries selected export promotion as the dominant strategy, mixed with performance-based ISI for limited periods of time, while the Latin American countries aimed mainly at the domestic market in spite of some attempts to change export composition. Secondly, in East Asia with the exception of Singapore, domestic firms were the principal economic agents but in Latin American that role was played by transnational corporations (TNCs). Thirdly, the East Asia countries invested more heavily on technology capacity building and on high-skill human resource training. Fourthly, except for Hong Kong, the interventions undertaken and the assistance provided by East Asian governments were stronger and more active than in their Latin American counterparts.

The above distinguishing features were also common within the East Asian countries. However, comparative studies of industrialization between the first and second generation of East Asian NICs have pointed out that the path followed by the former differed significantly from that of the latter in respect of four characteristics. First, the shift to export promotion strategy was initiated a decade earlier in the second generation; second, the dominant and pioneering role of domestic firms and their strict linkages with research institutions created new competitiveness; third, the substantial investment on training a highly skilled labour force; and fourth, a bureaucracy which effectively devised and implemented industrial policy. Jomo (2001) identified historical, cultural, bureaucratic and political characteristics of the second-tier NICs in South East Asia to explain why manufacturing growths in these countries were not remarkable and the corresponding industry policies were not implemented as extensively as occurred in the first-tier NICs.

2.4 Industrialization and competitive advantage within an increasingly globalized environment and under WTO rules

2.4.1 Regimes of trade and FDI and building new comparative advantage

As pointed out earlier, industrialization is inherently a process of building new, dynamic comparative advantage or competitiveness, and the effectiveness of this process was strongly influenced by the selection of export-orientation or import substitution as either a pure or a dominant regime. The perspective taken on the role of each trade regime for industrialization and for shifting to new comparative advantages varies among development economists, especially between the neoclassical economists and those supporting the 'development state'.

The neoclassical economists stressed the "invisible hand" of trade liberalization and the role of price signals, especially the change in the real wage. Primary or labor-intensive exports relied on low labor-cost competitiveness but as development proceeded the real wage would increase due to the increase in demand for labor, leading to a reduction in that advantage and requiring a shift to the production and export of capital and skill intensive commodities. Corden (1980) argued that the initial encouragement for new industries or future comparative advantages was essential but should be in the form of a tax subsidy rather than import protection or any measures that would penalize exports. Empirical evidence supported this opinion, as in the majority of countries where the skill and capital intensive, medium-tech industries were protected, they remained infant and never matured despite the considerable costs imposed by such policies. The cost of protection, including the domestic resource cost of the effective rate of protection, was up to 10 percent of GNP in Brazil (Pack 1986).

However, the neo-classical assessments on ISI and infant industry protection were both criticized, on theoretical and empirical grounds, by a number of economists (Wade 1990; Lall 1996; Chang 2001; Weiss 2002). The first critique challenged the unrealistic assumptions made, such as a perfect competitive market, in the model used for analysis. These assumptions were seen as especially irrelevant for the circumstances of developing countries. The second critique attacked the underestimation of market failures and the corresponding oversimplification of the impact of free trade on the

process of building technology capacity and new comparative advantages. This in turn provided theoretical justification for government intervention, and for assistance for creating new comparative advantages within the context of increased trade liberalization.

The well-known arguments for government protection of infant industries were initially presented by List, a German economist in the 19th Century. The theory of infant industry protection later evolved with the addition of new strands of analysis consisting of learning effects, externalities and technical change induced by establishing new industries. An empirical study by Chang (2003) argued that in the history of industrialization of countries over the world, all governments, including those of Germany and the US, supported infant industries by erecting tariffs barriers until such industries were able to produce competing products with longer-established rivals in the UK.

An increasing number of empirical studies on East Asian industrialization also pointed out that, before and during pursuing EOI, Japan and three of the first East Asian Tigers, except Hong Kong, still protected the domestic market for growth industries by use of a range of instruments, including the traditional ones. Wade (1990) showed that in South Korea, infant industries, such as motor vehicle production, were not only subject to protection in the initial years when the locally produced vehicles were not capable of being regionally competitive, but this continued even after 90 percent of domestic production was exported to low or middle-income countries in South East Asia.

Despite the dispute about infant industry protection, there has been a persuasive argument that competition was a "double-edged sword": new infant industries are protected from being crowded out by powerful MNCs, but run the risk of remaining uncompetitive. Hence protection has two corresponding sides, survival and inefficiency (Meier 1995). Accordingly, infant industries only become efficient, with reduced cost levels, on the condition of the protection being temporary and leading to assessment based on export performance. Strategic industries which receive early stage protection need to be encouraged to export as soon as they are capable. The early exposure of new industries to export markets is justified theoretically as a critical source of increasing comparative advantages, not only by enhancing economies of scale and reducing unit

costs but also by improving product quality as a result of increased application of international quality standards and competitive pressures (Weiss 2002). In other words, restrictions on imports need to be reduced gradually but decisively with increasing emphasis on exports.

In South Korea and Taiwan, firms in protected and promoted industries were required by government to move gradually into exporting, initially with some specific components and moving to complete products (Wade 1990; Amsden 2001). In contrast, Latin American countries sought to shift export composition from primary commodities to skill and capital intensive products but relied on the domestic market and missed the first stage of EOI. Consequently, local firms often failed to develop new comparative advantages as they were not gradually exposed to international competitive pressures in relevant markets.

With regard to MNCs, a number of empirical works also pointed out that in the initial stage East Asian governments did not simply encourage FDI but intervened in the flow of FDI to prevent possibly harmful impacts from powerful MNCs on local firms within emerging industries. In South Korea, restricting FDI and the entrance of MNCs before capital-intensive, medium-technology industries graduated in terms of scale and competitive advantage helped domestic firms to obtain the advantage of lower costs from economies of scale as well as to enhance their negotiation skills with foreign firms to obtain complex technologies (Kim 2003). In Taiwan, to avoid destructive competition between local infant firms and strong MNCs, the government encouraged MNCs to provide mutual assistance via subcontracting networks to local SMEs through "local content" requirements, the building of technology parks and firm association activities (Aw 2003).

Overall, it should be emphasized that not only did the governments of the first East Asian NICs apply strong international market test policies to support and force strategic, infant industries to upgrade competitiveness in the shortest possible time, they also applied a variety of protective measures for these infant firms and industries. The duration and level of protection was planned on the basis of effects from a combination of other policy instruments, especially financial incentives, so that the timing target could be achieved.

The NICs, especially in the case of Korea, accepted the discipline of extensive trade liberalization and FDI entry from Western countries after intermediate, capital goods industries were successfully developed, even though they adopted an outward-looking strategy earlier than other late-industrializing economies. In other words, these countries accepted the extensive, profound impact of globalization on domestic economies once new competitive advantages – which resulted in basic changes in industrial structure and a significant increase of manufacturing productivity and income per capita – were created.

2.4.2 Pursuing industrialization and building new comparative advantages within globalization

As noted by Stiglitz (2003) globalization has been going on for long time, yet it has become one of the most widely discussed phenomena in the economic literature since the beginning of the 1990s. There have been numerous definitions of this concept but it is generally acknowledged to involve increasing interconnection and interdependency among virtually all economies in the world, via increasing flows of capital, goods, technology and labor across country borders. This growing globalization process has been described in a vast literature as an ultimate result of dramatic political, technology and public policy changes. These include the end of the Cold War, the information technology revolution, a significant reduction in transport costs and the open economic and trade policies applied in developed countries, in ex-socialist, closed economies and in the NICs and other developing countries.

The impact of globalization on the socio-economic development of countries, especially the poorer developing ones, is one of the key issues in relation to contemporary economic development. Weiss (2002) interpreted the initial views on globalization presented in the 1960s and 1970s as opposing ones from 'dependency' and 'radical' scholars respectively. The former stressed globalization's negative influence in terms of unequal trading and issues such as transfer pricing and inappropriate technology transfer imposed on poor economies by powerful TNCs. The latter, in contrast, emphasized that a country was a part of a global capitalist economy and that, therefore, there existed

mutual benefits of collaboration between the rich and the poor countries through the internationalization of capital.

Nonetheless, a growing number of recent studies, significantly represented by Weiss (2002) and Urata and Kawai (2003), presented neutral perspectives of impact of globalization on industrial development within a country. Globalization brought both challenges and opportunities, but whether and to what extent the benefits outweigh the costs varies between developing countries. Net positive outcomes depend on not only the level of economic development and industrialization but also on concrete historical circumstances as well as political and cultural features of a given country, especially on government policies towards FDI and its management.

The most critical issue relating to industrialization is how a country can pursue that process after accepting trade and FDI liberalization commitments under WTO. According to these commitments many selective or functional industrial policy measures would not be permitted. The matter has become crucial, especially for countries trying to build up new, high-order comparative advantages while still remaining in the second stage of industrialization or in the second stage of ISI which is assessed as a difficult, decisive phase.

There has been a vast literature analysing the economic impact of globalization but most works have generally discussed the opportunities and challenges for developing economies from globalization, without particularly addressing the issue of industrialization. Also, the literature on industrialization, including recent studies, has not focused on the impact of trade liberalization and MNCs nor on industrial development in developing countries.

Approaching the above topic from the perspective of re-thinking the East Asian miracle, some empirical studies highlight the significant link between uncontrolled imports and high TFP growth in the Japanese 'miracle' in the 1960s, suggesting that their industrialization success was due to an import-oriented strategy (Lawrence and Weinstein 2001). The exposure of domestic firms to international competition via either exports or an import-oriented strategy, forced them to learn and to upgrade technology intensively, to create competitive advantages for survival and development. These

studies, however, are limited to addressing the question of the extent to which import liberalization contributed to the industrial development of East Asian countries.

The work of Weiss (2002) is one of very few studies focusing on the relationship between globalization and industrialization. However, only one of his seven-chapter books directly discusses this issue, mainly on the impact of TNCs in global chains which are categorized into two types, value and commodity. The author identified four conditions determining the extent to which locally-owned firms can benefit from TNCs: the degree of domestic competition, the extent of links between TNCs subsidiaries and local suppliers, the mobility of labor and the scope for clustering between TNCs and national firms. Such conditions explain why the full package of FDI benefits, finance, technology, marketing and management, may remain just a potential.

Weiss is also one of a few authors using the wage competitiveness indicators presented by UNCTAD to point out that low-cost labor does not necessarily lead to wage competitiveness. This is contradictory to common arguments of development economists that low-cost labor is a typical type of competitive advantage of poor developing countries. However, like many other authors, he did not analyse the two critical issues on trade liberalization. The first is the survival and development of emerging, strategic industries, especially in the difficult, more technology-intensive phase as mentioned in the previous part. The second is the industry-level impact of this process, and of relevant government policies, on structural change within manufacturing during certain phases of industrialization.

Empirical studies (Lall et al. 2003: Chang 2001, 2003) have shown that TNCs chiefly invest in the low-value stage of producing relevant export goods, so a critical issue is how to stimulate TNCs to shift to higher-value activities. Such a transition has only successfully taken place when the host country government has been capable of creating a conductive environment that ensured that adequate levels of local skill and technology capacity were reached. This occurred in a few countries such as Singapore, in some elements of the electronics industry in Malaysia and of the automobile industry in Thailand. The other negative impact of the entry of TNCs into the domestic market is the crowding out of large national firms, as occurred in Latin America in the 1970s and

1980s. This is likely to degrade national technology capacity if fewer R&D activities are conducted in the host country by the TNCs than by the national firms.

Based on both analysing profound theoretical ground and empirical evidences of forty-six developing economies, Shafaeddin (2005) argued that the rapid trade liberation recommended by the neo-liberal school since the 1980s has not achieved its objectives. For all cases of the sample countries, there was no positive or adequate strong correlation between manufacturing value-added, structure of output in favor of manufactured goods and the growth of export of manufactured goods. In half of these countries, especially the low income countries, across-the-board trade reoriented production resources from import-substituted, dynamic industries to those based on static comparative advantage, caused premature de-industrialization. Trade liberation is merely associated with the rapid manufacturing export growth in a few East Asian NICs where industrial capacity reached a certain point or in several dynamic, mature industries such as aerospace in Brazil prior to trade liberation.

2.5 Conclusion

Despite its important role for development, industrialization and even de-industrialization has occurred at varying rates between countries in the world, especially over the last three decades. The late industrializing economies have important advantages of greater access to foreign technology, skills and capital compared to the early industrializing countries, and therefore have the possibility of catching up by shifting to new, high-order comparative advantages or by moving up the ladder of manufacturing competitiveness. However, whether and to what extent that potential may be actualized in reality depends initially on the selection of a sophisticated combination of the two chief strategies of industrialization, export promotion and import substitution. Carrying out the selected strategy in turn requires upgrading technology capacity, training capable engineers and managers, and strengthening key organizations and firms. The experiences of NICs in Asia and in Latin America have illustrated these propositions. Increasing globalization and the increased role of WTO commitments are seen as providing both opportunities and challenges for industrializing countries. But more detailed studies on this very important theme are clearly needed.

CHAPTER 3
LITERATURE REVIEW AND ANALYSIS OF MANUFACTURING COMPETITIVENESS

3.1 Introduction

The 1990s witnessed waves of economic globalization that both created more market opportunities and intensified competitive pressure on firms, industries and economies around the world. To survive this growing international competition and to access the potential benefits of these features of the world economy, every firm and economy has had no choice but to create, sustain and strengthen competitiveness. Competitiveness therefore has been treated by a growing number of authors as the core of economic development, with the level of competitiveness as an indicator of the development stage of a country (Harrison 1999; Cho and Moon 2000). Analysing economic development through competitiveness is a better way of understanding whether, given a certain amount of resources, a country is developing sufficiently well enough (UNIDO 2002). For late industrializing countries, as discussed in the previous chapter, every stage of industrialization can only be completed successfully if these countries increase their level of competitiveness. In other words, strengthening competitiveness lies at the heart of the catch-up process (Zhang 2004).

Accordingly the last decades of the 20th Century were the time when competitiveness emerged as a central concept for economists and policy makers. Nonetheless, this also means that the concept of competitiveness, which was originally and simply defined in business strategy books as a firm's ability to survive and develop in the market, has become both multi-dimensional and controversial. Given the importance of, and the scale of the debate on manufacturing competitiveness, the objectives of this chapter are to survey the literature to investigate the following issues:

- the definitions, taxonomy, determinants, single and overall indicators of competitiveness in general; and

- the definitions, determinants and single and overall indicators of manufacturing competitiveness in particular.

3.2 Competitiveness: Concepts, determinants and indicators

3.2.1 Concepts related to competitiveness

3.2.1.1 Competitive advantage and comparative advantage

Competitive advantages and comparative advantages are two different concepts. The neoclassical theory of international trade presents two forms of comparisons of countries, namely absolute advantage and comparative advantage. The basis of comparisons of absolute advantage is actual productivity or accounting cost, while that of comparative advantage is opportunity cost, in both cases, for the traditional factors of production such as resources, capital and labour. Porter (1990, 1998) emphasized that competitive advantages studied in his works were not the traditional, factor-based ones. They were new types of comparative advantage capable of explaining the trade patterns of nations lacking traditional production factors, such as Korea. He distinguished two main types of competitive advantage, lower cost and differentiation. The former is "the ability of a firm to design, produce and market a comparable product more efficiently than its competitors" and the latter refers to "the ability to provide unique and superior value to the buyer in terms of product quality, special features, or after-sale service" (1990, p. 37). Both types lead to "superior return" per input unit or higher productivity than competitors. These advantages are based on non-traditional factor inputs such as high-technology, knowledge, networks and so on, therefore *competitive advantage* is often referred to as *new comparative advantage* or *dynamic comparative advantage*.

In comparison with neoclassical theories, comparisons of *competitive advantage* are normally based on actual levels of the input variables rather than opportunity cost values, and accordingly involve comparisons of *absolute comparative advantage.* High levels of competitive advantage are generally rare in late industrializing countries, due to low productivity levels, thereby requiring intensified attempts to increase competitiveness. Arndt (2003) and Hamalainen (2003) also clearly distinguish the two

concepts, comparative and competitive advantage stating that both have a significant impact on international trade, but are differentiated in nature.

3.2.1.2 Competitiveness and competitive advantage

Various definitions of competitiveness have emerged. According to the OECD Secretariat, it is "the ability of companies, industries, regions, nations or supranational regions to generate, while being and remaining exposed to international competition, relatively high factor income and factor employment levels on a sustainable basis" (OECD 1996, cited in Tikhomirova 2001, p. 5). It can be noted from this definition and that of the other organizations such as the United States Competitiveness Policy Council, the World Economic Forum (WEF) and the International Institute for Management Development (IMD) that, though they are somewhat different, most definitions of competitiveness reveal common features:

- they comprise two key components: the first is competitive ability as the means and the second is a high standard of return or income as the objective; and
- they view both instruments and objectives as being in a dynamic status, meaning they are continuously changing, increasing and being compared to other rivals.

The nature of competitiveness is stressed as being "flexible and diffuse" (Lall 2003). Given this, perspectives on competitiveness have inevitably changed across time, both within an economy and across countries. Especially, the current intensified competitive environment across international borders has challenged a range of assessments of national competitiveness. Moreover, as an indicator involving comparison with competitors, competitiveness at any level should not be understood as being at a certain or fixed level but at a comparative and changeable one.

The two concepts of competitive advantage and competitiveness are widely treated as homogenous by scholars, because creating a competitive advantage is a critical condition for forming competitiveness. But the relationship between the two remains somewhat problematic: competitiveness may be a mixture of all the competitive advantages, or perhaps the sum of all the competitive advantages. According to Harrison (1999), there are situations in which a divergence between these two concepts emerges. These occur in the case where competitive advantages are regarded as

indicators of the static potential state of competitiveness, not likely to translate into ongoing or actual competitiveness which is viewed as a dynamic concept since it contributes to economic growth.

3.2.2 Defining competitiveness at different levels

The purposes and features of competition are differentiated between firm, industry and national levels. Consequently, the competitiveness concept certainly needs to be more specified at each level. Defining firm competitiveness as the capacity of a firm in the market to achieve higher productivity and a strong profit ratio in the long-term has achieved high consensus in business literature, due to the competitive nature of all firms in market economies. This definition is in turn widely extended to define industry or sub-sector competitiveness, which is treated as the total competitive ability of firms operating in that sub-sector.

However, national competitiveness, as explored by Porter (1990) in order to investigate why some nations have achieved more successful economic development than others, is a more controversial concept. Despite his important and interesting research activities in a major study, Porter did not give a precise, decisive definition of national competitiveness. At first he states "the only meaningful concept of competitiveness at the national level is productivity" (1990, p. 6), but productivity is widely seen as an index or direct determinant of competitiveness ranging from firm to national levels rather than a definition of competitiveness. He then goes on to emphasize that "seeking to explain "competitiveness" at the national level, then, is to answer the wrong question. ... To find the answer, we must focus not on the economy as a whole but on specific industries and industry segments" (Porter 1990, p. 9).

The difficulties and ambiguities concerned with defining national competitiveness have raised a widespread debate surrounding the meaning of national competitiveness. The strongest opponent has been Krugman (1994), who argued that competitiveness could be applied to firms and industries as actual competitors but it is an elusive concept when applied to a national economy. And the opinion with competitiveness is both a wrong and dangerous opinion" (p. 23, cited in Cho and Moon 2000). Nonetheless, his key argument that a nation does not act like a company nor is world trade a zero-sum game,

was instantly and strongly criticised by Prestowitz, Thurow and Cohen (1994), theoretically and empirically.

In spite of these and other criticisms, growing agreement about the importance of national competitiveness was demonstrated by several major studies ranking national economies that were published, discussed and used by worldwide business and policy makers. Such studies included those of the WEF, IMD and UNIDO, all referred to below. For developing countries, the validity of the concept was emphasized by Lall (2003), as a basis on which effective technology policies and development strategies can be devised to overcome imperfect markets, especially for technology.

The OECD definitions stressed fundamental socio-economic goals as being a higher standard of living and high rate of employment (OECD 1996). The United States Competitiveness Policy Council (1993) viewed national competitiveness as "the ability to produce goods and services that meet the test of international markets while our citizens earn a standard of living that is both rising and sustainable over the long run" (Frischtak 1999, p. 83). The World Economic Forum (WEF) (2008) emphasized wider elements of national competitiveness, defining it as "the set of institutions, policies and factors that determine the level of productivity of a country". The International Institute of Management Development (IMD), however, only focused on surrounding factors or those shaping the business environment, "a nation's environment creates and sustains the competitiveness of enterprises" (IMD 2008).

Regardless of all the various forms of definitions, it can again be noted that the concept of competitiveness at the national-level consists of two components:

- the means, understood as the total international competitive ability of all the institutions in the economy, particularly demonstrated in a number of features such as a favourable environment for business activities; and
- the goals, understood as the macro-economic development goals.

3.2.3 The determinants and taxonomy of competitiveness

It is obvious that, as specified factors, the determinants of competitiveness and the benchmarking of competitiveness are even more problematic than its definition. The higher the level at which the concept is studied the more controversial concrete definitions and measures become, because it is difficult to find relevant factors in a broader scale (UNIDO 2002). In addition, as mentioned earlier, due to different purposes and scales, competitiveness definitions are different at the micro and macro levels, leading to the study of its determinants becoming quite complicated and sometimes leading to contradictory results. Given this, there are no clear conclusions about definitions, determinants and policy measures in the relevant studies (Harison 1999; Cho 2000).

However, it should be noted firstly that, throughout the various studies in the literature, the most typical characteristic of the determinants of competitiveness, as generalized by Kay (2000), is "distinctive capabilities ... hard to replicate even when competitors realise the benefit". Secondly, the views about competitiveness can be categorised depending on how the determinants are approached. To begin with, as interactive drivers of production, the determinants of competitiveness are approached by most authors from the *supply-side* or from a *direct* perspective. The supply-side determinants are in turn distinguished as *visible* or *factor-based* and *invisible* or *knowledge-based*. The direct group in turn is categorised into *basic* or *low-order* and *advanced* or *high-order* determinants.

The low-order competitive advantages include natural resources, climate, location, and unskilled or semi-skilled labour. These are thereby mainly inherited, easily replaced and eroded in the long term. The agriculture sector and the developing economies provide mostly low-order competitiveness. In contrast, high-order competitiveness is built up by factors that are sophisticated: modern technology, skilled labours and high quality research institutions. Those require deep investment but create high-value products sustainable in the long term. High-order competitiveness therefore expresses the significant characteristics of strong corporations, high-tech industries and advanced countries (Porter 1990, 1998).

Nevertheless, while the group of supply factor-based or input-based determinants is traditional and important, it does not sufficiently reflect the influences of ICT and other intangible knowledge-intensive factors that appear increasingly important for competitiveness in a new or knowledge-based economy. A range of studies (Quinn 1992; Bounfour, Eliasson and Kay 2000; Sheehan 2002) identify and take into account the impact of more invisible factors including knowledge, research and development (R&D), software, patents, design rights, trade marks, reputation and networks. These are categorized as intellectual capital that contributes greater value-added to high-technology products and services.

Competitiveness determinants can be simultaneously approached from the *demand-side* as in Porter's well-known "diamond model". These are just *indirect* ones as their influence on competitiveness must come through the supply-side channel. Porter analysed home or domestic market demand in detail as a driver of competitiveness, based on concrete evidence taken from advanced countries. There are several identified channels through which home demand influences the competitive advantage of industries within a nation. The first channel is the industry segment size, generating large demand for particular varieties of a given good. A nation can gain economies of scale if it has the greatest absolute domestic market size of segment, or a larger segment market size compared to other nations, due to the relevant characteristics of such a market.

The second channel arises from sophisticated and demanding buyers who place pressure on firms to produce a variety of high quality of goods. This forces firms to innovate and change technology to meet those demands. The third channel is through the local buyer who can anticipate needs that will be widespread in the global market in the future, enabling firms to take advantage of producing these goods earlier than their competitors. The last channel is the home country's overall market size, which is especially important for industries involved in high R&D costs, which imply large sunk costs and considerable uncertainty about the level and timing of returns.

On both the supply and demand sides, from an administration level perspective, competitiveness is divided into *levels* ranging from *firm* and *industry* to *country*.

Alternatively, they can be analysed in *sector competitiveness* levels such as manufacturing and export activities. A spatial view leads to *territorial competitiveness* including *province, zone* or *city* (Porter 1990; Frischtak and Sercovich 1999)

Table 3.1 Supply-based taxonomy of competitiveness

Determinants/ Levels	Visible, factor-based	Invisible, knowledge-based
Firm (I)	*Basic:* plants, equipments, low or semi-skills, labour, money *Sophisticated:* medium & high technology, skilled labour	Knowledge, software, R&D, organizational routine, reputation, competence management, trademark
Industry, Province (II)	(I) plus location	(I) plus intra-firm networks
Aggregate Sector, Country (III)	(II) plus roads, ports, energy, communications	(II) plus basic research, education, government competence

Source: Author's taxonomy based on literature.

A competitiveness matrix of supply-side determinants across levels can be constructed based on available studies. As can be seen in Table 3.1, vertically each competitiveness level comprises of two types of determinants: visible and invisible. Horizontally, each competitiveness group of factors can also be divided into a number of levels or extents. Nevertheless, it should be stressed that there is no clear boundary among these types of competitiveness, reflecting its complicated character.

In the diamond model, Porter (1990, 1998) states two other competitiveness sources. The first is supporting and related industries and the second is firm strategy, structure and rivalry. The first is described as those "in which firms can coordinate or share activities in the value chain when competing or those involved in products that are complementary" (p. 105). These can be categorised as supply-side determinants if they provide material or components to industry A or demand-side if they consume goods produced by A. Regarding the second source, firm strategy and structure are obviously supply-side drivers while rivalry affects the market share of firms and can thus be treated as a demand-side driver.

Porter argued that competitive disadvantages that are supply-side factors can in fact be indirect contributors to competitiveness. Paradoxically, difficult production conditions force nations and firms to innovate or to create other competitive advantages, as

occurred in Japan. Meanwhile, he stressed the competitiveness determinants expressed within the diamond model applied both in industry and at the national level if industry is understood as the basic unit of competitiveness analysis of a nation.

Porter's two-sided approach is, on the one hand, supported by a number of authors when analysing technology and education as the critical drivers for competitiveness in East Asia (Kim and Wong 2003). On the other hand, the Porter model has been criticised for neglecting the impact of FDI in large countries and the role of government bureaucracy in NICs. It has been argued that the diamond model is only appropriate in developed nations and cannot explain the competitiveness and economic success in some advanced countries such as Canada and NICs (Rugman 1998; Cho 2000).

To overcome those shortcomings, Cho (2000) presented an extended model including nine factors grouped into human and physical factors as underlying elements. The role of government is viewed as exogenous by Porter but is accounted as direct factors in the Cho model. Beyond this, the nine-factor model is actually a slight extension of the competitiveness determinants stated by Porter for the firm and then for industry in the diamond model. For instance, highly skilled labour in Cho's model is included as professional management and engineers in Porter's model.

Further, based on the nine-factor model, Cho defines the life cycle of national competitiveness in terms of four development stages of a nation. Each stage is characterised by two or three of the nine competitiveness factors. However, despite the importance of finding appropriate models for developing countries, Cho's works are mostly constructed from Korean experience. They therefore lack empirical evidence from other developing and developed countries, and should be taken cautiously.

3.2.4 The indexes of competitiveness

Economists, business analysts and policy makers have made considerable efforts to measure competitiveness at each level. TFP and the export share in GDP are two of the indicators used for assessment at all levels of competitiveness. However, given various determinants and features of different levels and scales of economic activities, the indicators selected vary at the same level and between levels.

Some authors (Sercovich and Frischtack 1999; Weiss 2003) share the view that firm-level or corporate competitiveness indexes include high productivity, good product quality, low cost, high profit ratio and market share. Harrison (1999) emphasized TFP which is interpreted as the total contribution of knowledge-based factors to competitiveness. But, being an abstract indicator, it thereby is used for theoretical research rather than applied in the practice of developing competitiveness strategies.

Regarding industry-level competitiveness as the total competitiveness of firms in that industry, some authors suppose that industry-level competitiveness indicators are similar to firm-level indicators (Frischtack 1999). However, perspectives on national competitiveness and the corresponding selections of indicators have remained both different across authors and controversial. The most widely known indices are those constructed by WMF and IMD, which are based on somewhat different definitions but both sets of rankings have similar strengths and weaknesses. Both involve similar key groups of economic, political and social factors, aimed at capturing and quantifying the sources of national competitiveness from multiple angles. These factors include numerous macro as well as micro variables which subsequently divided in to index and sub-index, over 110 for WMF and over 320 for IMD. The data include both hard data from statistics and soft data from surveys converted to appropriate scores. The considerable value of both indices lies in their practical usefulness for business, providing investors with concrete indicators of a country's overall environment as well as some of its more fundamental aspects (Lall 2002; Causa and Cohen 2006).

Nevertheless, in spite of the benchmarking and business value and continuously improved methodology, the WMF and IMD indices have been widely criticised. One significant criticism raised has been theoretical, and is concerned about whether models in which there are linear relationships between GDP per capita as the dependent variable and the independent variables are theoretically warranted (Cho and Moon 2000; Lall 2002). The structure of the independent variables and the major index of the dependent variable thereby has been continuously changed since 2001, prompting debate on the precise value of the dependent variable and the correspondent ranking based on those indexes. The objectiveness and appropriateness have been questioned,

because the values of some variables are obtained from surveys instead of from available hard data.

For the developing countries, these indices have become more problematic when the differences between developing and developed countries are partly considered and are addressed through unequal weights of elements of the technology sub-index. The reason for these difficulties is that the assumption of economic efficiency is rarely viable for the developing economies, where the market has failed to solve the problems of backward technology and low-skilled workers (Lall 2003).

This may explain why the ranking of a number of countries by the WEF is quite different from that in the IMD rank, despite the similarities between the indices. Meanwhile, considerable debate has been generated in Vietnam, whose WEF competitiveness ranking has tended to move in the opposite direction to one of the most important economic indicators, accepted worldwide, namely GDP growth. For instance, in 2004 Vietnam's WEF ranking fell 17 places by comparison to 2003, but its growth rate of 7.4 percent in 2004 was higher than in 2003 and it has continuously been a member of the group of countries with the highest growth rate in the world in recent years.

A number of economists (e.g. Frischtak and Sercovich 1999; Kawai and Urata 2003) argued for TFP as the most appropriate indicator for national-level competitiveness, especially in an era when the invisible, knowledge-intensive factors are identified as increasingly important factors for economic growth. However, the contribution of TFP to the economic growth of NICs is still empirically controversial. Reviewing a half a century of studies on TFP, Chen (1998) showed that the concept of TFP differed vastly across studies, due to variations in definitions and factor input measuring methods, which in turn were subject to arbitrary judgements. Therefore, Chen suggested using TFP "as a starting point for further analysis but should be used as the verdict on the growth experiences of economies especially for those fast-growing ones in which the conventional neo-classical assumptions and steady-state economic conditions might not apply" (p. 26).

Pack (2000) also tried to explain the contradictions between East Asia's remarkable firm-level efforts to enhance technology capacity and macro-level studies that claim that TFP remained a moderate factor for economic growth or national competitiveness. Both theoretical and empirical reasons were suggested. The theoretical reason was that both production models, the Cobb-Douglas function or the accounting growth method were inappropriate to apply to assess the role of TFP for East Asia. The empirical reason was identified as limitations of large firms in South Korea or Taiwan in upgrading technology capability in the highest technology sectors of industry, such as automobiles and electronics.

3.3 Manufacturing competitiveness: Definition, determinants and indicators

3.3.1 Defining manufacturing competitiveness

A considerable number of economists and policy makers stress that industrialization of newly industrializing countries (NICs) has occurred within quite favorable international trade conditions, where free trade applied for both export of competitively low or medium-tech goods to, and import of higher-tech goods from advanced countries. But for countries implementing industrialization within a restricted environment under current WTO rules, manufacturing competitiveness has become a vital factor.

As a competitiveness concept, manufacturing competitiveness (MC) is defined and analysed by numerous studies at three levels – firm, industry or sub-sector to the aggregate or national-level sector. While most studies give short definitions which consist of firm purposes and some key drivers, viewing the firm as a basic and correct unit to measure MC, Sercovich introduced a long, multi-dimensional concept of firm competitiveness as the firm ability to:

- stand at the best practice frontier, in terms of production and management, being cost efficient, quality-oriented, dependable, flexible and innovative;
- has accumulated significant human and physical capital endowment, as well as intangibles, with demonstrated productive and technological capabilities; and

- has superior economic and financial performance. (1999, p. 85)

This concept also again clearly comprises two main components – means and goals. The means capture new determinants or competitive advantages and the goals include both economic and finance goals of competitive activities.

Industry or sub-sector-level MC is viewed by most authors as a pure expansion of the firm or sector in which a competitive firm operates. This is an acceptable definition with respect to competition in international markets where the purpose of the firm and industry coincide.

But at the aggregate level, defining MC is problematic as in the case of national competitiveness. MC is stated by Sercovich (1999) as "a function of the accumulation of systemic capabilities" (p. 87). But this definition appears ambiguous because it presupposes the accumulation biased future situation rather than the current capabilities of a competitive manufacturing sector, reflecting the difficulties in defining MC and competitiveness in the realistic terms.

3.3.2 The determinants of manufacturing competitiveness

Being an important sector of the national economy, MC is also determined by factors that influence national competitiveness as mentioned earlier. In the literature on the East Asian miracles, several studies presented a finding that NICs' rapid industrial growth is mainly the result of exceptional capital accumulation (World Bank 1993; Krugman 1994).

However, the majority of studies tend to focus on key supply-side, knowledge-intensive factors including technology capacity (TC), labor skills, firm organization and networks. Numerous empirical and theoretical works on development studies, emphasize strong technology capacity as the most important determinant of MC in industrialized countries in general and in the industrialization success of NIEs in particular (Porter 1990; Lall 1996, 2003; Pack and Nelson 1999; Kawai and Urata 2001; UNIDO 2002; WEF 2000-2008; IMD 2005-2008). More recently, based on East Asia's fast recovery from the financial crisis in the late 1990s, several studies stressed TC as a

pillar for sustainable economic development and for MC (Wong and Ng 2001). For all industrialized economies, upgrading TC within a context of competition on the technology front is especially critical to sustain their competitive edge (Poon 2002).

There are numerous definitions and taxonomies of TC. But it is widely acknowledged as the capacity to effectively select, master, change and create technologies (Tran, Ca 1999). To build up and sustain MC, one country has to be able to climb up higher on the technology capacity ladder. Based on a range of influential previous studies on technology and on recent empirical evidence, Lall (2003) has summarised the common features of technological learning and of recent FDI. His theoretical ideas are further supported and made more specific by the findings of empirical studies on all the first and second-generation NICs (Kawai, Urata, Kim, Wong et al. 2003).

TC is initially built up from foreign sources, including imported capital goods, license arrangements and foreign direct investment (FDI). It should be noted, from available studies of TC, that effective absorption of foreign technology is not a simple and easy task. In fact, it is incremental and costly, and involves a risky learning process across all levels due to certain shortcomings of the technology market, especially tacit knowledge (Lall 2003).

Having the advantage of a transferred full package of technology, management and marketing skills, FDI appears a less risky and thus more rapidly effective channel in the initial stage of building TC and manufacturing competitiveness in NICs in South East Asia. FDI, thereby, is considered by UNIDO (2002) as a critical determinant of MC for latecomer economies.

Nevertheless, both theory and studies on East Asia suggest FDI tends not to help the host country achieve a deeper TC, which lays a base for stronger competitiveness and is required by an essentially technology-intensive phase of industrialization. In other words, FDI and other foreign technology transfer is essential but not sufficient (Amsden 2001). MNCs are not willing to sell or transfer high or leading-edge technology overseas, as this is the decisive competitive advantage over which they have to retain control within their global value-added chain. Moreover, R&D is costly and risky, especially in developing countries where there are few well-trained scientists and

engineers. Given this, MNCs' technology adjustments in these countries are principally limited to adapting to the specific conditions of the local market to ensure investment efficiency (Sheehan 2002; Weiss 2002; Lall and Kim 2003). The technology transfer from FDI, even in joint-ventures in host countries, was rapid in the initial period but slow for most of the rest time, due to conflicts in long-term purposes and benefits (Kim 2003).

Domestic technology efforts proved to be an alternative pathway, as occurred in Korea and Taiwan, or were supplementary to MNCs to strengthen TC as in Singapore. The former process requires intensive learning and huge investment on R&D and occurs slowly in the short term. But in the long term, it can enable the manufacturing sector to actively and dynamically access technology and sustain competitiveness. Nationally owned, large-sized firms can be principal economic agents by exploiting economies of scale of the first movers (Amsden 2001), attracting scientists and engineers who have been trained abroad, improving organizations and spending a considerable proportion of revenue on R&D (Kim 2003).

Labour skill is emphasized across studies of Japan and of the NIE experiences as the next most important determinant of manufacturing competitiveness. High technology is only mastered and innovated by well-trained, highly skilful labour. However, unlike readily imported equipment, such a skilled labour force is only accumulated slowly, not only by official training in schools but also through on-job training. There have not been as many significant theoretical studies on the skill building process as there have been on technology. Those available are on country-specific education and training experiences and its role for industrialization.

In line with the common determinants analysed above at each level of manufacturing competitiveness, a few specific determinants are also stressed. Analysing manufacturing firm competitiveness from the perspective of a *value-chain,* Porter (1990, 1998) emphasizes "gaining competitive advantages requires that a firm value chain is managed as a system rather than a collection of separate parts" (p.47). Managers should not focus on reducing costs or making differentiation to increase firm competitiveness only in the operations stage, but should do so also in other stages of the value-chain, such as product development, marketing and services.

At the firm and industry-level, many studies stress organizational forms and networking as crucial factors for competitiveness. But there is a large divergence of research issues between theoretical studies and empirical works on industrial organizations and linkages. The former only analyse abstract models of competitive strategies within different market structures as an extension of microeconomics theories (Tirolle 1987). Most of the latter (Amsden 2001; Kim 2003) focus on investigating features and behavior of leading, nationally-owned firms targeted by governments to gain the economies of scales of first movers within medium-tech, strategic industries, to be pioneers in R&D activities and to strengthen TC.

According to Amsden (2001), the national leading firms like *keiretsu or chaebol* tend to be more diversified than specialised for two reasons. Firstly, they can avoid the risks of facing required core competence of any technology that they are not able to achieve. Secondly, they can obtain generic project skills and profits from the economies of scope. In the first stages, national firms tend to be supplementary to multinational corporations rather than competitive due to limited competitiveness, but many of the national leading firms in Japan and first NICs later became MNCs.

Most of their organizational structure is vertical or hierarchical, to obtain the efficiency induced by specialisation at each level. Alternatively, some have a horizontal-integrated structure with homogenous plants established in different countries so that they can easily penetrate foreign markets (Itao 2004). Nevertheless, as Lim (2003, p.3) noted "Economic globalization, together with the IT revolution, is undermining the competitiveness of the large, vertically integrated industrial organizations that have been the mainstays of East Asian industry in the age of industrial technology". To overcome this challenge, since the 1990s, a more flexible organization has been created as an open network, which can therefore be treated as a new competitive advantage or as a determinant for MC, especially at industry-level (Best 2000).

A network can take different forms and is defined in various ways. In the strategic management view it is an "emerging form of organization encompassing both short and long-term cooperation between two or more firms seeking to be more competitive..." (Thorelli 1986; Jarillo 1988; Slow and Milles 1992, cited in Poon 2002, p. 76). The

initial underlying forms of an intra or open network are subcontracting between large, medium and small-sized firms (SMEs) as in Japan, or cooperation among SMEs as in Taiwan or Italy. But home-based firms are likely to expand activities to different countries, establishing cross-border or global networks enabling integrated firms to not only lower costs through specialisation but also acquire product-developing abilities. An open network is therefore a critical competitive advantage when competition has shifted from being price-led to product-led (Best 2000).

The competitive advantages of intra-firm networks mainly relate to location, which is stressed by some authors as a specific-competitive asset. Many networks concentrate within a certain location to exploit economies of agglomeration. The typical cases are Silicon Valley, Route 128 in the US, Italian industrial districts and the Singapore hub (Best 2000; Paniccia 2002; McKendric 2003). Within industrializing countries, available studies point out that firms operating in special locations, such as Export Processing Zones, can gain other benefits from low factor costs, market access and government policy.

At the national level, studies focus attention mostly on access to capital, education and government regulations for adjusting business activities. Sercovich's work (1999) analyses the impact of these factors on national manufacturing competitiveness (MC) in terms of reducing the cost of "mobilizing the resources and doing business". In comparison with national-level determinants analysed earlier, macro-influences on MC are especially emphasized due to by-products caused by manufacturing activities. This in turn creates the issues of standard-ensuring cost and absorptive capacity of by-products.

Sercovich's presentation of distinct factors for national-level MC is relatively detailed, however it still lacks an important element of social infrastructure that is basic R&D activities. His emphasis on higher general level of education and skills of language and mathematics is essential but these are general education requirements for national competitiveness rather than specific for MC. While the focus given by Lall (2003) on the engineering and natural science student numbers appears more appropriate.

3.3.3 The indicators of manufacturing competitiveness

Labor productivity, measured by real value-added per unit of labor input, was the shortest overall competitiveness indicator presented by Harison (1999) "labor productivity can be approximated to either the real GDP per employed person or the real per capita GDP in the economy. This would offer a practical yardstick for assessing relative overall productivity..." (p. 45).

Based on a comprehensive definition and corresponding determinants of MC, Sercovich and Frichtak (1999) demonstrate indices of firm-level MC as seen in Table 3.2. It can be noted that the strongest points of this measure approach are multi-dimensional, concrete and practical. These therefore provide widely applicable benchmarking criterions especially at firm-level. But these indices are not well structured into distinct groups of performance and determinants as organized by their index of competitiveness. Further, despite numerous determinants and relevant indicators, the role and weight of new, invisible drivers like networks is not taken into account in benchmarking.

Revealed competitive advantage (RCA) is a widely used indicator to analyse industry-level competitiveness. But as discussed in the first part of this chapter, the comparative advantage concept differs from competitive advantage. An economy has competitiveness of good A but may not export or merely exports a small amount. Consequently, RCA does not actually reflect the industry-level competitiveness of one country. It is an appropriate index of a country's trade patterns rather than competitiveness. Alternatively, firm-level indicators such as total output and export, productivity, R&D expenditure and intensity, export share, profit ratio, and concentration level, are selected and extended to analyse industry-level MC.

As is in the benchmarking of national competitiveness, aggregate MC indicators are most contradictory. Sercovich (1999) demonstrates a number of debatable indicators that undoubtedly are the result of a somewhat confused definition and complicated determinants analysed earlier. For example, it is difficult to verify that the low tax rate is a correct index for competitiveness. The low tax rate may reduce business costs, thus encouraging business investment and economic growth, but later it is likely to cause a

budget deficit. This consequently reduces the government expenditure on infrastructure which is an important determinant of national competitiveness.

Table 3.2 Levels of manufacturing competitiveness indices

Indicators	Measures
Firm-level	
Productivity	Value-added or output value/ labor
Quality and environment	ISO 9000
R&D and design activities	New product value / total sale
Education of labor force	
Training	Training expenditure on labors
Investment	I/C
Extent of automation and diffusion of advanced manufacturing method	
Domestic and international market share	
Profitability	
Cash flow position and level of indebtedness.	
Industry or sub-sector level	
Relative unit labor cost (RULC)	Export/output, trade balance, market share in world export, revealed comparative advantage Xi/Ei ...
Export performance	
National or aggregate sector level	
TFP	Real interest rate, tax rate, tax burden/GDP, infrastructure tariffs, supply of nature sources and level of pollution.
Systemic costs:	

Source: Author's synthesis from Frischtak and Sercovich (1999).

UNIDO index

The most well-known, applied index for national-level MC is the competitive industrial performance index (CIP) constructed by Lall for UNIDO (2002) in order to benchmark industrial competitiveness of national economies in the world. The CIP consists of two groups of drivers and performance. The drivers are domestic technology, transfer technology through FDI, licenses, labor skills and infrastructure. The performance indices include manufacturing value-added, manufacturing export value-added, technology structure of MVA and technology structure of MVE.

Table 3.3 CIP index

Components	Measurements
Performance	
Manufacturing value-added	Value-added per capita (MVA)
Manufacturing export	Value-added export per capita (MVE)
Technology structure of value-added	Share of high and medium-tech value-added in MVA
Technology structure of export	Share of high and medium tech in MVE
Drivers	
Domestic technology effort	R&D expenditure per capita by productive firms
FDI	FDI three-year average per capita
Technology licenses	Royalties and technical fees paid abroad
Labours skills	Habrison-Myer index + number of enrolments in technical subjects
Infrastructure	Number of telephone mainlines and power/capita

Source: Lall (2003).

As occurs within the two famous benchmarking measurements and WMF and IMD, the substantial role of technology is also emphasized in the CIP structure. But, given the purpose of overcoming the limitation of these two indicators, constructing CIP takes a significantly different approach. As a result, CIP has a sharper structure of a limited number of only economic variables that are justified by the economics of evolution for industrial development (Lall 2003). In addition, MC determinants are clearly categorized into drivers and performance, with their values obtained from hard data. Given those features, CIP is relatively objective, and strictly an appropriate tool for benchmarking MC of a country, especially for those still based on the traditional drivers.

However, CIP is criticized as an oversimplified index for several reasons (Rajan 2003) First, being restricted in economic variables, the structure does not reflect the impact of influences from non-economic, important factors on MC. Second, the component also does not capture the different influence of a factor between developing and developed countries. Third, new knowledge-based drivers are not sufficiently taken into account. Communication infrastructure is simply adding a telephone line, missing the very important means induced by the ICT revolution such as personal computer, internet or

mobile access. CIP therefore is viewed by some as an extreme index compared to the WEF and IMD rather than an improved, medium one.

OECD index

Emphasizing that productivity is one of the most important indicators of industrial development but is of less interest to international investors, OECD economists, Causa and Cohen (2006) built three indices for ranking the industry competitiveness of 51 countries around the world. While the first is simply comparative productivity to the reference country, the second and the third indices are the sum of weighted factors contributing to GDP per capita after subtracting capital which is supposed to be estimated by investors. The second comprises infrastructure (Z), human capital (H) and TFP, while the third includes an indicator of integrated world trade (T).

The most significant strength of this ranking compared to others is a solid theoretical base with the weight of each index's component regressed from a modified Cobb-Douglas function in which the independent variable comprises capital, human capital and infrastructure. The data is objective as it is derived from World Bank and UNIDO statistics.

3.4 Conclusion

Competitiveness in general and manufacturing competitiveness in particular are important, diffuse and multi-level concepts which lead to numerous corresponding indicators. Disputes still remain on the national level and tend to converge in terms of components of definition, the performance objective and determinants.

Competitiveness can be categorized into numerous types, in each case measured by relevant indicators, and is thereby influenced by numerous factors from both the supply and demand side. Each level is characterized by certain determinants. Due to the leading role of manufacturing and the importance of competitiveness within an intensifying globalized economy, MC obviously has become the central and most critical issue of industrial development.

The decisive determinants for creating MC are technology capacity, well-trained labor, firm organization comprising nationally-owned large firms or MNCs, or networking between domestic SMEs and MNCs. Domestic technology learning and R&D efforts either in firms or linkages between firms and universities proved to be the crucial factors for success of industrial development in the long term. To benchmark MC of firm type, industry and the whole of manufacturing, economists can use a number of indices based on various models and variables. The indicator widely agreed as the most important is productivity comprising labor productivity, cost productivity or cost efficiency and TFP. However being a performance indicator, it can be combined with others that are driving factors for overall competitiveness indices as designed by the largest international economic organizations.

CHAPTER 4
POLICY FOR CREATING MANUFACTURING COMPETITIVENESS: THEORY AND PRACTICE IN THE NEWLY INDUSTRIALIZED COUNTRIES

4.1 Introduction

The history of industrialization is intertwined with the involvement of government and industrialization is a "matter of strategy and policy" (Riedel 1988). Chang (2002) noted that, to going back to the 18th Century in Britain where the first industrial revolution took place, the government was an aggressive user of infant industry protection. This author also highlighted the fact that, for a period of over a century from 1816-1945, "the USA had one of the highest average tariff rates on manufacturing imports in the world" (p. 61). The post-1945 period also witnessed governments actively involved in the reconstruction and development of manufacturing industries in Western European and Japan. At the same time, governments played a major role in building and strengthening independent economies via industrialization in numerous ex-colonial Asian and African countries. The remarkable and rapid success of strengthening manufacturing competitiveness and the industrialization of the first NICs or the 'Gang of Four' East Asian nations, with deep intervention of government, has enriched both the theory and practice of industrialization. Their graduation as industrialized countries around the mid-1980s also coincided with the beginning of the era of greater liberalization and deregulation.

The role of government has thus been a central issue in economic development and a clear understanding of this role is vital to knowledge of the industrialization process. To date no major school of thought regards the role of government as simply to fulfill very basic responsibilities, such as ensuring security and collecting basic forms of taxation. However there remains considerable dispute about both the degree of state intervention

in market and industrial activities and the appropriate instruments to be used. This chapter thereby focuses on the following themes:

- the justification and definition of industrial policy;
- the taxonomy of industry policies and their corresponding conditions of application, especially in the context of trade and FDI liberalization, and of the WTO rules;
- the industrial policy instruments applied in the various industrialization stages of the NICs; and
- the effectiveness of the industrial policy.

4.2 Government policies for industrialization and competitiveness: Justifications and definitions

4.2.1 Perspectives on the role of government for industrialization

Three main schools of thought about the role of government for industrialization can be distinguished. To begin with, the mainstream neoclassical scholars hold that the economic role of government should be limited to providing the framework of indirect support for the operation of the market, such as by stabilizing the macroeconomy via fiscal and financial policies and by ensuring basic physical and social infrastructure. Theoretically, whereas the neoclassical authors admit several failures of the market mechanism, they emphasize the automatic adjustment mechanisms of free trade and of market prices as the best channel and the clearest signal for efficient allocation of resources to industries, sectors and locations. Consequently, direct, micro interventions by the government in the market are regarded as "distortions", generating inefficiency and likely to lead to government failure (Little 1970; Bhagwati 1978; Krueger 1978, 1983). Krueger (1997) criticized six theoretical premises or stylized facts which laid import-substitution strategy and infant industry protecting policy "were at best simplistic and in most instances simply wrong". In particular, the good theory of comparative advantage which is a base for free trade was misinterpreted by economists and as a result misapplied by policy makers. Contradicting export expansion to import substitution, she also explained the empirical evident of success of East Asian NICs was a reversal to import substitution policy.

In terms of empirical evidence, neoclassical authors frequently cite examples such as inefficient government intervention to promote industrialization in numerous Latin American and South Asian countries; the over-estimation of achievable development through such policies in some targeted industries, such as computers and aircraft in Japan; and the emergence of over-capacity in heavy industries in South Korea in the 1980s. The industrialization success of the East Asian NICs was explained as the result of cost-reducing methods applied and of the pressure for technology upgrading arising from trade liberalization and competition. The relationship of active government promotion on the performance of targeted industries was found to be insignificant in some regression analyses (World Bank 1993).

However, given the heavy government involvement in upgrading manufacturing competitiveness and industrial development, the neoclassical perspective on the limited government role in industrialization has been heavily criticized. It is argued that, theoretically, by approaching the determinants of industrialization mainly from the trade regime, this school has undervalued the role of building technological capacity. This has proved to be a decisive factor for success in industrialization but has been largely restrained by market failures, which are much more serious than in the neoclassical assessment (Lall 1996). In practical terms, the neoclassical emphasis on the role of free trade was has also been attacked on the basis that limited trade liberalization policies were applied during the industrialization of developed countries or of the East Asian NICs, as pointed out above.

The second and more neutral school emerged as "market-enhancing" policies in the mid 1990s, advocating that governments should play a more active role in remedying market failures. Nonetheless, given the ability and advantages of institutions, "government does not substitute for private, but may play a complementary role in shaping an institutional environment conducive to a particular type of organizational coordination" (Aoki, Murdock and Okuno-Fujiwara 1997, p. 12). This approach also offers a number of policy instruments "such as contingent rent, financial constraints, deliberation councils, and staggered-entry strategies which induce coordination and cooperation in the private-sector institutions" (p. 22).

This perspective, nonetheless, is widely regarded as narrow, since its explanation for market failures is limited only to those arising from the framework and capability of existing institutions and their forms of cooperation. The solutions to be taken by government are therefore also restrained in such organizational terms. Moreover, the forms of indirect support that government might provide under this approach require that institutions already possess a significant level of capability, which is not necessarily the case for many firms in developing countries.

The principal school challenging the neoclassical orthodoxy was the development state view, which comprises several divisions all of which emphasized the deep engagement of the state in industrialization. Analysing the characteristics of the market in the actual context of, and the real issues facing, developing countries, this school placed the emphasis on building technology capacity as a corner stone of industrialization. Market failures, especially in technology and knowledge-based assets, could not be resolved by private firms or institutions alone, especially by small firms that were restrained by numerous conditions (Amsden 2001). Consequently, more direct, selective and stronger intervention by government needed to be devised and implemented. In other words, government in developing countries should "govern the market" through the chief functions of "guiding and coordinating" to lead the national economy to achieve its underlying development objectives (Wade 1990; Lall 1996)).

The guidance mission of the state was based initially on developing a strategic vision of appropriate industries, of competitive advantages at different stages of industrialization and of effective policy instruments to accelerate structural transformation. The method of "getting the price wrong" was regarded by neoclassical economists as causing distortions but was applied intentionally in East Asian nations, especially in South Korea, and proved the "wrong turn to right" notion based on the evidence of the success of the remarkable industrialization of these countries (Amsden 1989). Another important role of government is coordinating and resolving conflicts among private institutions, especially those between the interests of foreign firms and of the nation.

Identifying further two detailed types of externalities, Rodrik (2004) regarded the information coordination externality as the most rampant in developing economies, and that this directly implied a role for industrial policy. One example was the discovery of

the economy's relative cost structure or that firm had to find "a certain good, already well established in world markets, can be produced at home at low cost. This may involve some technological tinkering...but this tinkering rarely amounts to something that is actually patentable and therefore monopolizable" (p. 9). Therefore, the first-best policy recommended by the author was subsidization for investment in these new, non-traditional industries (p. 11).

The second type of externality occurred when a new investment required large scale and geographic proximity to the other. This required coordination of the investment and decision of entrepreneurs in different industries, sectors and government intervention except for some highly organized industry. This coordination model differed from cluster approach which was applied for specific sector. Therefore the corresponding government interventions were also distinguished from the other externality responses by the way that these policies instruments did not require any subsidy since when the cooperation was established, all firms would be profitable.

This unorthodox view was strongly attacked by orthodox economists, based on evidence of government failures, such as rent-seeking and incompetent bureaucracies, and especially on the grounds of failure to calculate the cost of distortions and of deviations from competitive market outcomes caused by government policy (Islam 1992). Further, the reality of trade liberalization, as well as the role of WTO-induced rules, was also used by neoclassical economists as grounds for limiting the extent of government intervention.

4.2.2 Defining industrial policy

Government interventions on industrialization are principally channeled through policies devised for that process. A policy or a set of policies is distinguished from others by two underlying components, objectives and instruments. Those in turn are selected and devised in the light of fundamental economic theories and of the concrete economic, institutional, social and political features of a given country in a certain period of time.

Definitions of policy toward industrial development obviously reflect the complexity and diversity of perspectives of the role of government in industrialization. Since the beginning of the 1970s, the term "industrial policy" has been used in Western countries as a unique name for a set of policies designed to achieve industrial progress. Initially, it was not separately defined or clearly distinguished from other economic development policies (Hughes 1970). However, in the beginning of the 1980s, as analysed earlier, the success of export-oriented industrialization in East Asia in the context of increasing globalization highlighted the role of international competitiveness at every level. As a result, industrial policy was defined as "a summary term for the activities of government that are intended to develop or retrench various industries in a national economy in order to maintain global competitiveness" (Johnson 1984, cited in Wettasinghe 2001, p. 42).

One perspective with a growth emphasis viewed industrial policy as government efforts to alter industrial structure for promoting productivity-based growth (World Bank 1993). This definition pointed out that both the content of industrialization and long term goal of industrial policy is the structural transformation of the economy and of industry.

Takahashi (1997) presented a matrix, as is indicated below, that helps to clearly differentiate this policy from other macroeconomic and microeconomic policies. Nonetheless, he emphasized the interaction between private sector and government and "the fundamental problem of industrial policy, then, is how to create comparative advantage" (p. 294). This is applying the context of Ricardo's static model, developing countries should allocate resources to labor-intensive industries in which they have comparative advantage or permanently as just subordinate economies to the developed countries. However, Takahashi advocated for industrial policy being defined as that which constructs a country's industrial structure focusing on rapid technological advance and could be called a "vision policy for catch-up economies" (p. 295).

Box 4.1 Industrial policy classification by mechanism of resource allocation and level of analysis

Level of analysis	Mechanism of resource allocation	
	Autonomy	Priority
Macroeconomic	Fiscal & financial policy	Economic planning
Microeconomic	Anti-monopoly policy	Industrial policy

Source: Takahashi (1997).

Recalling the nature of industrialization as the process of creating new comparative advantage and the evolution of the definitions of industrial policy as analysed earlier, it is evident that the shortest and sharpest definition of government policies for achieving industrialization or industrial policy is *the set of government activities for creating new industrial comparative advantages and strengthening international competitiveness* (Johnson 1984; Takahashi 1997; Weiss 2002).

4.3 Industrial policy: taxonomy, conditions and effectiveness

4.3.1 Taxonomy of industrial policy

4.3.1.1 Broad and specific industrial policy

While insisting that industrial policy is distinctive from other economic policies, Johnson (1984) clarified the concept of industrial policy by distinguishing industrial policy at macro and micro levels, or between broad and narrow versions of industrial policy. The former includes government incentives for private saving, investment, R&D, cost reducing, quality control, maintenance of competition. The latter, however, just focuses on facilitating uptake of certain technologies which will be needed in the future and anticipating as well as assisting industries which will decline but are still essential for society.

Patrick (1986) also divided industrial policy into macro and micro elements. The former is focused on the supply side and is defined as including "all macroeconomic policies to increase the quantity and especially quality of the factors of production" and "this definition incorporates educational policy as an important element" (p. 4). The latter is more typically described as industrial policy, and is regarded by Patrick as:

> ... identification of certain specific industries deemed to have sufficient national importance to merit and receive differentially favorable policy treatment in order that those industries have access to resources in degrees or timing different from what would occur through the normal operations of the market-place. (p. 5)

Komiya (1988) presented a broader and well-organized definition of industrial policy compared to that demonstrated by the previously mentioned authors:

> (1) policies that affect the allocation of resources to industry, including (a) items that affect the infrastructure of industry in general ... (b) items that affect inter-industry resource allocation; or (2) policies that affect industrial organization as moving and reallocating resources between sectors of economy and industry (a) items aimed at regulating the internal organization of particular industries such as industrial restructuring, consolidation of firms ... (b) items affecting cross-industry organization such as small and medium enterprise measures. (p. 3)

This is a broad definition of industrial policy and according to the author, the narrow sense of industrial policy is only part 1 (b). Such a definition captures the role of government intervention in industrialization's major content that is drawing more resources to manufacturing and to targeted industries.

Emphasizing that macroeconomic policies have an impact on overall demand in the economy but unintentionally have different influences on different industries, Wade (1990) distinguished these more clearly from industrial policy. According to this author, industrial policy is defined as any policy inducing different impacts on different industries. Such a kind of industrial policy was classified as two types, functional and industry-specific. The former aims at enhancing functions across all industries and therefore refers to generic policy while the latter, as its name suggests, targets specific industries. It is notable that the content of the first or the functional type of industrial policy as defined by Wade is a little narrower than that of the first or generic industrial policy as stated in both the previous and the following authors.

Industrial policy structure was also clarified by Lall (1994) in two elements, with the first again called functional and the second referred to a selective industrial policy. The distinguishing criterion between the two is whether a preferential treatment was applied to any specific firm, industry or technology or not. Accordingly, functional policies are defined as those aimed at remedying market failures without any priority being given to specific targets, while the selective policies are those designed to favor one target over another.

It is noteworthy that, since the 1970s, the concept of industrial policy has been incrementally clarified and focused. Despite some differences in the names, expressions and especially in the incidence of industrial policy, theorists have reached a general consensus that such a policy consists of two elements or layers, being generic (macro, broad and functional) and specific (micro, narrow and selective). Those are principally distinguished by the magnitude of the targeted subject and by features of the instruments used.

The functional or generic industrial policy is designed to remedy such generic market failures such as lack of information, public goods and externalities, in order to facilitate the development of industrial firms.

In contrast, and derived especially from the development-state view, selective industrial policy targets certain firms, industries that are seen as the potential pillars of competitiveness of the economy in the future. Due to such specific and difficult goals, applied industrial policy instruments are direct, intense and quite specific. These instruments include preferential access to credit, below-market rates of interest, tax exemptions, entrance licenses, subsidies for high-technology transfer and R&D, training arrangements for employees with high or specific skills, facilitation of firm mergers and restructure, export subsidies, high import tariffs or quotas, and so on.

4.3.1.2 Industrial policy categorized by market side factor and level

Supply-side and demand-side industrial policy

As was noted in the previous chapter, competitiveness at any level is a result of the interaction between supply-side and demand-side factors, and so each industrial policy will aim at targeting one or both of these factors. While many policies (such as technological upgrading) will both strengthen a nation's ability to supply particular products and increase the demand for those goods, functional and selective industrial policies for upgrading competitiveness can be divided as two groups in terms of whether they are primarily focused on the supply-side or on the demand-side. The former includes policies towards investment, technology, human resources, firm organization and networks and the latter includes exchange rates, trade and competition policies.

Firm, industry and national industry policies

As analysed in the previous chapter, there are three main levels of competitiveness: firm, industry and economy. These share some commonalities but have differences in terms of definition and determinants, including some of the most important ones. Accordingly, governments in different countries, including those of late industrializing countries, need to devise industrial policies for building and upgrading competitiveness at all three levels, and both functional and especially selective policies can in turn be categorized into these three levels.

Generalizing industrial policy experiences in various countries, Sercovich (1999) demonstrated at these three levels, a matrix of the industrial policy priorities that should be applied for varying economies in different circumstances, such as newly opened, in transition or still closed.

4.3.2 The effectiveness of industrial policy

Policy analysis and assessment normally focuses on policy effectiveness, which is measured by the differences in performance outcomes between policy-targeted groups

and other groups, given adequate similarity in, or after correction for, other factors influencing the output of the two groups. A number of empirical studies have made attempts to assess whether, and to what extent, the industrial policy objectives were achieved in the East Asian NICs, where industry polices were applied actively. Most of these studies, however, have used only the comparative analysis method. Recently there has been a growing but still small number of studies employing econometric models to examine the quantitative impact of industrial policy on manufacturing performance. Some of these are reviewed below.

An early attempt to assess quantitatively the impact of industry policies on the high performing countries in East and South East Asia was made by World Bank economists in 1993 (World Bank 1993). Using regression analysis, this study concludes that industry policies had no significant impact on the development of specific or targeted industries in those countries, but suggest that positive impacts on the overall economy were achieved. However, the econometric model employed by the World Bank economists to examine the impact of industrial policy was criticized severely as flawed, and their relevant findings were regarded as erroneous by a number of economists (Lall 1990; Stigtliz 2001; Chang 2002).

Using two simple OLS models, Smith (2000) examined the quantitative impact of industrial policy measures in Taiwan in the 1980s on industry competitiveness. The first model was used to test whether or not the applied industrial policy incentives had a positive impact on rising high value-added, targeted industries. The finding was that policy incentives were positively correlated, not with growth in the emerging industries but that in the declining industries which were high labor-intensive and low value-added.

The second regression model examined the impact of industrial policy on the competitiveness of the actually targeted industries that were identified by the results of the first regression model. The results also found a weak correlation between industrial policy incentives and both productivity and export performance, although the authors accepted that there were several limitations in the methodology used, especially for the individual TFP studies.

Lee (1996) constructed an econometric model comprising two vectors of group of independent variables, using panel data across 38 industries within 30 years to evaluate the effectiveness of the strong industrial policy instruments used in South Korea. The coefficients showed that, of four industrial policy instruments (tariffs, non-tariff barriers, preferential loans and tax concessions), only the last one had significant impact on manufacturing labor productivity growth. Jefferson (1999) employed the model noted below to test the impact of policy initiatives and firm characteristics (denoted by vector Z), on total factor productivity in China:

$$\mathrm{Ln}\,TFP_{it} = \mathrm{a} + \mathrm{b}\,Z_{it} + \mu_{it}$$

He found that the policy of deregulated supervision of state-owned firms had enhanced their productivity.

Sercovich (1999) generalized the results of a number of studies with the conclusion that selective or narrow industrial policy has had long-term success in some countries, but in many others it proved uneconomic and unsustainable as compared to generic industrial policy. Stiglitz (2001), however, argued that the limitations of industrial policy targeted on a few industries had been overstated. In his view, the impact of industrial policy should not be only narrowly assessed on a targeted industry, but also in terms of the aggregate industrial performance, given the importance of linkages among industries and of externalities.

4.3.3 Conditions for selecting appropriate policies

Every country pursues industrialization in a context and under conditions that share both commonalities and differences with those in other industrializing countries, even in those countries in the same region. Nevertheless it can be stated that, from fundamentally different viewpoints, neoclassical, market-enhancing and development-state policy makers share several common conditions upon which generic and selective industrial policy can be implemented effectively. The conditions stressed as the most important are the capacity, neutrality and transparency of the bureaucracy. However, the neoclassical authors emphasize government failures and argue that it will be difficult to

fulfill the requirements for government to design and implement selective industrial policy characterized by favorable treatment of one industry relative to others. They stress that such discriminating policy, both in theory and in practice, is likely to generate rent-seeking activities, corruption and the misallocation of resources, particularly in developing countries where bureaucrats remain low-paid and with limited capacity, and where the juridical system is deficient.

The market-enhancing view also stresses the possible rent-seeking consequences of implementing industrial policy, but proposes a new mechanism called contingent-rent to avoid or at least to reduce such misallocation of resources. The contingent-rent mechanism requires rigorous performance-based conditions for receiving preferential treatment (Aoki et al. 1997).

The development-state authors, in contrast with the neoclassical authors, stress that, like many other factors, the capacity and efficiency of bureaucracy in designing, implementing and correcting industrial policy can be improved and upgraded by learning and doing (Lall 1996; Chang 2001; Shafaedddin 2005). In addition they note that, despite several general features, there is no common, detailed blueprint for the choice of different elements of industrial policy for various countries. Governments in each country, through trial and error, have to find the optimal mix of industrial policy instruments corresponding to their own economic development level and social, institutional and political features at a given period of time.

The opponents of the application of industrial policy have recently highlighted the restraints on the use of specific industrial policy under increasing trade liberalization subject to WTO rules, under which virtually all industrial policy instruments are restricted. Nevertheless, Chang (2001) theoretically and practically indicated certain "room" within which industrial policy can still be implemented despite these restraints.

First, even under pre-WTO regime, policy industry instruments were largely restricted, thereby "the North East Asian countries had to exercise a lot of ingenuity in choosing the means of industrial policy and diplomatic skills to iron out problems with their trading partners" (pp. 68-69). Second, the WTO is an "evolving system" and thereby not all abstract regulations can be clearly translated into practice.

Third, not all forms of subsidy instruments have to be abandoned in the WTO framework. Those include initially "perfectly legal" or "non-actionable" ones which comprise all subsidies provided by generic industrial policy, and some by the selective industrial policy, which are not made subject of a complaint by a trading country. Poor countries, whose income per capita is below $US1000, can even use an "actionable" subsidy, as for these it is required that the complaining country prove "material damage". This is not easy, since for most such countries their trade is a very small percentage of world trade. Fourth, also according to WTO rules, some countries can still raise tariff rates due to balance of payment problems.

Emphasizing the change in the international economic environment induced by WTO's rules, Weiss (2002) identified industrial policy instruments that must be completely abandoned, such as local content requirements and import-substitution subsidies; and ones that will be greatly reduced, such as the scope for emulation of foreign technology. However, the supporters of industrial policy also indicate concrete channels, and corresponding times, at which the implementation of industrial policy still can be undertaken, especially for the least-developed countries. These include export subsidies in countries that have not reach a certain level of world market share, negotiated tariffs among WTO members and subsidies for specific R&D activities. Overall, limited industrial policy can be applied in WTO members, but it would be difficult to build up local firms, and achievie sophisticated technology and indigenous technology capacity.

Shafadeddin (2005) analysing more deeply the possibilities for the application of industrial policy under the WTO regime, pointed out general and specific contradictions in the design as well as in the implementation of the Uruguay Road Agreement rules. This author also indicated contradictions within definitions of specific industries or sectors, and acknowledgment of concrete articles which would limit industrial policy spaces. The detailed analysis was made on the impacts of WTO rules on industrialization, especially restrictions on protection of infant industry via subsidies for export, specific industries, firms and implementation of TRIP.

4.4 Stages of industrialization and corresponding industrial policy practice: Two tiers of the East Asian NICs

Following the practice and experience of Japan, the first group of East Asian NICs (the "gang of four" including South Korea, Taiwan, Singapore and Hong Kong) and the second tier group (the ASEAN-4: Malaysia, Thailand, Indonesia and the Philippines) applied a variety of industry policies to achieve industrialization. As discussed earlier, it is useful to distinguish three stages of the industrialization process of these countries. The first stage was the promotion of labor-intensive, export industries and the construction of initial capacity for medium to high-technology, heavy industries. The second stage was the development of the intermediate-goods industries and the medium-technology, capital-intensive industries, while the third stage involved the development of high-tech, knowledge-intensive industries. The three boxes below (Boxes 4.1 and 4.3) provide a systematic summary of the goals pursued and instruments used to achieve those goals during the three stages of industrialization in these countries.

As previously discussed, these policies are classified as functional or selective, as mainly supply-side or demand-side, and as applying at the firm, industry or national levels, to incrementally upgrade competitive advantages and manufacturing competitiveness in each stage of industrialization. The central industry development emphasis evolved from low labor cost, labor-intensive, export-oriented industries to capital-intensive, medium high-tech industries employing higher skilled, relatively well paid labor, and then to knowledge-intensive, high-tech industries employing a highly skilled labor force. As outlined in the boxes, the main policy instruments used also changed over time to reflect changing strategy goals, changing local circumstances and the different challenges posed by seeking to improve manufacturing competitiveness in different types of industry. Detailed performance standards and international tests were applied in all periods, for example by the conditions that applied to export incentives.

Box 4.1 First stage industry policies in first and second tier East Asian NICs

National-level

Functional

Supply-side

- Domestic investment incentives, established Development Bank to assist the capital requirements for export-oriented, priority industries. Attracted foreign investment (except South Korea).
- Education: total subsidy for primary and secondary and in part for vocational training, under- and post-graduate level.
- Technology upgrading and R&D activities: formed national applied research institutions, colleges. Direct and indirect subsidy provided for national technology research institutions. Promoted R&D network among institutions and firms.
- Infrastructure: Direct or indirect complete or in-part subsidy for construction of roads, ports, industrial and export-processing zones, roads, ports railways, energy plants, industrial zones and export processing zones.

Demand-side

- Export market expansion by devaluated exchange rate
- Import restriction: ban, quota, high tariff for import of competitive products

Industry-level

Functional

Supply-side

- Promotion of backward, forward linkages through clusters, industrial zones

Selective

- Finance incentives and assistance for developing labour-intensive, export industry: longer-term loan at lower interest rates, tax exemption, deduction, rebates; concessionary tariff for equipment and materials imported for production to export.

Demand-side

- Import restriction: quota, tariff imposed on goods competing with those manufactured domestically by heavy industries

Firm-level

Functional

Supply-side

- Intensified modern technology assimilation: financial incentive subsidy credit, tax exemption and reduction.
- Initial promotion of network among firms, between large and SMEs by subcontracting; vocational training institutions and firms

Selective

Supply-side

- Strengthening firm capacity: Formed large national corporations provided preferential loan and credit
- Initial promotion and assistance for SMEs

Demand-side

- Restrain over or destructive competition by maintaining monopoly and oligopoly status via entrance license for strategic industries in which public-owned firm promoted to be the national champion
- Government purchase for national public-owned firms.

Source: Author's construction based on the sources referenced in this chapter.

Box 4.2 Second stage industry policies in first and second tier East Asian NICs

National-level

Functional

Supply-side

- Using Development Bank and domestic banks to extensively assist the targeted industries, mainly heavy, medium-high tech, export in this stage. Encouraging foreign direct investment to higher tech industries (except Korea) , domestic saving incentives.
- Strengthening technology capacity: intensified applied research and process innovation through establishment of national technology research centers, foundations.
- Expanding and diversifying cooperating research and training networks between firms and research institutions and universities.
- Training and developing human resource: expansion of poly-technic college and university engineering courses; government expenditure for postgraduate students trained oversea, mainly in the US; collaboration with more-advanced countries' schools, enforcement of in-plant training for workers, including sending engineers to work oversee to accumulate experiences.
- Subsidy provided for construction of infrastructure, highways, airports, railways, electricity plants, clusters, industrial zones.

Demand-side

Fair competition promotion: Fair Trade Act, Law on Intellectual Property Protection.

Selective

Forming centers for training high-tech, specific skills (Malaysia)

Industry-level

Functional

Supply-side

- Developing higher value-added, medium-tech industries based on the interactions of backward, forward linkages.

Selective

- Preferential finance provided for firms operating in heavy targeted industries and their export: national or private domestic banks (South Korea) are required to provide these firms long-term large loan at below-market interest rates; tax exemption, deduction, holiday for the first years of establishing, accelerated depreciation allowance.
- Established national research institutions specializing on targeted, high-technology industries.
- Local content requirement at higher level for locally-owned (Korea) or foreign firms in heavy industries to foster backward-linkages, parts and component industries.

Demand-side

- Domestic market protection for heavy industry: quantitative restriction by quota, tariff on import of competing goods
- Export ratio/sale of firms in strategic industries is one of main strict conditions for receiving heavy subsidy.

Firm-level

Functional

- Encouraged high-tech firms and R&D activities in firms: tax incentives granted for firm having high ratio of R&D expenditure/ revenue
- Developing subcontracting and other collaborative forms between SMEs and LEs

Selective

"Making the winners":

- Incentives provided to firms to be merged in to large national corporations or
- Entrance license required to enter priority industries to ensure economies of scale, strengthening several large public-owned firms to become internationally competitive.

Source: As for Box 4.1.

Box 4.3 Third stage industry policies in first and second tier East Asian NICs

National-level

- Technology and R&D: shifting from applied, medium-tech to basic science and high-technology by establishment of research foundation and research leading universities, institutes. Deepening R&D network among institutions and universities and firms.
- Human resource training: transition from technical colleges to more high-technology courses.
- Physical infrastructure: In-part subsidy for spreading internet, broadband, wireless technology.
- International trade liberalization: substantially lowered tariffs.

Industry-level

Functional:

- Foreign direct investment: stronger incentives for flows in to high-technology industries (include South Korea). Promotion of highest value-added, high-tech industries

Selective

- Finance incentives granted for developing technologically leading industries: ICT, biotechnology, life sciences.

Firm-level

Functional

- Financial incentives for product technology and basic-science R&D activities of firms: income tax deduction for non-capital R&D expenditure, deduction on expenditures for technical human development and related R&D institutions; reduced tariff for R&D equipment import.
- Deepening R&D at firms and the research network between large and SMEs, domestic and MNCs, firms and research institutes, universities, domestic and spin-offs in advanced countries.

Selective

- Preferential treatment for high-tech firms
- Antitrust law to create fair play for all firm types

Source: As for Box 4.1.

It is of course the case that the precise characteristics of the industry policies used and their degree of effectiveness differed between the first and the second-tier NICs groups and indeed between the countries in one group. There were three main features distinguishing policies for strengthening manufacturing competitiveness and undertaking industrialization in the first tier NICs from those of the second-tier NICs. Firstly, with the exception of Hong Kong, governments in Japan and the other three first NICs applied specific industrial policies to a larger extent than the second tier NICs did. Secondly, the first NICs deliberately used large locally-owned corporations, including state-owned firms or cooperation between large state-owned enterprises (SOEs) and small, medium-sized enterprises (SMEs), or government facilitation of MNC-induced technological learning, as the main engine for strengthening indigenous technological capability and developing internationally competitive high-technology industries. But the second-tier NICs relied more on FDI to expand manufacturing. Thirdly, the "gang of four" applied policies of high-quality education, training and R&D more at all levels, both domestically and overseas, more intensively the ASEAN-4.

Fourthly, the original four East Asian tigers achieved more impressive results in terms of industrialization than did the ASEAN-4. These achievements consisted of strikingly higher manufacturing productivity, higher income per capita, strong indigenous technological capacity for international competition and sustained economic development.

4.5 Conclusion

Whereas there has continued to be a dispute on the role of industrial policy for industrialization, the concept of industrial policy has gradually evolved, and become clarified and well-classified. A wide variety of policy approaches and instruments, which nevertheless had certain commonalities, have been applied through industrialization, but needed to be subject to change to appropriately respond to each level of manufacturing competitiveness and each respective stage of industrialization. Generic industrial policy is widely accepted and implemented, and can be applied under WTO commitments. Selective or specific industrial policy was significantly applied in three of four tiger economies, which all had competent, disciplined and relatively uncorrupt bureaucracies. These countries achieved strong manufacturing technological capacity and the highest level among latecomers on the competitiveness ladder as well as the most rapid pace of industrialization. For industrial development, the second-tier NICs implemented policies which were less diversified, more generic, dependent on FDI, but had a lower level of effectiveness than those devised and implemented by the first NICs. The reasons for these disparities are rooted not only in differences between the two groups in history and culture, but also in the competence and management ethics of their bureaucracies.

CHAPTER 5
ANALYSING MANUFACTURING COMPETITIVENESS AND INDUSTRIAL POLICY EFFECTIVENESS IN VIETNAM: CONCEPTUAL FRAME WORK AND METHODOLOGY

5.1 Introduction

The previous chapters argued that a key element in any successful industrialization path is upgrading the competitiveness of the manufacturing sector and creating new comparative advantages within that sector. Various concepts of competitiveness, as well as traditional and modern determinants of it, were surveyed. In terms of improving competitiveness, both theory and the experiences of the NICs highlight the importance of government policies for developing the manufacturing sector at all levels: at the firm, industry, region and national economy levels. To analyse manufacturing competitiveness, it is necessary to provide a specific definition which is then quantified in terms of one or more empirically-based indicators. The role of market forces and of government actions in determining competitiveness levels essentially needs to be tested and evaluated through empirical analysis using appropriate models. This chapter outlines both the theoretical framework and the empirical measures that will be used in the analysis, together with the data which will be analysed. The choice of models and indicators is based on a review of the relevant theoretical literature having regard to the reality of economic development, both in general and in the manufacturing sector in Vietnam.

Four types of empirical analysis are undertaken in this thesis in relation to manufacturing competitiveness in Vietnam and in the other countries of the ASEAN-4:

(i) measuring different aspects of manufacturing competitiveness in Vietnam;

(ii) analysing the impact of the level and quality of production factors, such as capital, wages and R&D, on overall total factor productivity levels;
(iii) extending this analysis to compare productivity levels, and the role of different determinants of those levels, in Vietnam with those of the other countries of the ASEAN-4; and
(iv) analysing the effect of various policy measures on manufacturing competitiveness in Vietnam.

To undertake these tasks, three related methodologies drawn from the literature are used. First, index number methods are used to carry out task (i); these methods are outlined in Section 5.1 below. Secondly, factor analysis methods are used to address tasks (ii) and (iii) (see Section 5.2 below). Thirdly, methods based on the neoclassical growth model are used to test the effect of various government policies on productivity growth (see Section 5.3 below). The basic analytical foundations do not carry with them the full implications of the neo-classical theory, and can be used for data analysis without incorporating the limitations of neo-classical theory for policy purposes.

The empirical analysis undertaken in this thesis is based on a detailed database, down to the firm level, assembled for the first time from published and unpublished official Vietnamese Government sources. The central element is a database on the full population of manufacturing firms in Vietnam (over 20,000 manufacturing firms by 2005) constructed within the Vietnamese General Statistics Office (GSO) with financial and technical assistance from UNIDO in 1998 and 2000 and from the World Bank since 2000. This is supplemented where necessary, in particular in computing value-added by the results of a sample survey of manufacturing enterprises undertaken by GSO for 2002 and 2005. Data issues are discussed in Section 5.4 below.

5.2 Indicators of manufacturing competitiveness

5.2.1 Single factor competitiveness indices

5.2.1.1 Partial productivity

As discussed in previous chapters, both the concept and the corresponding indices of manufacturing competitiveness (MC) differ across various levels of analysis, especially between the traditional economic levels of firm or industry, and the newer territory-based levels of province, region or country. Nevertheless, it is widely agreed that a broad concept of competitiveness has two components, determinants or drivers and objectives or performance (WEF, IMD, OECD and UNIDO). The latter is normally used as a narrow definition of competitiveness, being shortly and directly manifested by productivity (Porter 1990, 1998; Harrison 1999; Sercovich and Frischtak 1999; Lall 2003).

Productivity is calculated as the ratio of output per unit of a given input, where the input can be either the input of a single factor or a composition of many factors. These two approaches thus give rise to either partial productivity measures or to total factor productivity. The *partial productivity* indicators to be used are the following:

Labour productivity = value-added/number of employees
Wage productivity or wage competitiveness = value-added/total wage payments
Capital productivity (the inverse of capital intensity) = value-added/capital stock
Cost productivity or cost efficiency = value-added/total input costs (including wage and materials costs)

It should be noted that, despite the use of the term 'partial productivity', the value of each of these variables for a given firm or industry is affected not merely by the components named in the definition, but also by the use of other inputs. For instance, a high level of labour productivity or capital productivity is not the result of merely skilful labour or modern machines but also involves the incorporation of these two production factors with others such as efficient firm organization, firm networks and firm location. Their value will also reflect the nature of production activities in the given firm or

industry: other things being equal, firms involved in capital intensive production of chemicals or motor vehicles will have higher labour productivity and lower capital productivity (higher capital intensity) than firms involved in light manufacturing activities. In the latter firms capital per unit of labour will tend to be lower (capital productivity higher), and value-added per employee lower, than in the former.

Thus these indices, and the factors determining their values, are closely interrelated with one another. Labour productivity is influenced both by technical strength and capital intensity as well as by the quality of labour and the efficiency with which it is used. Thus it is often used as an overall competitiveness index for two reasons. One is the decisive role of technology for long-term, sustained competitiveness, and the other is the fact that manufacturing labour productivity tends to be strongly correlated with GDP per capita. But it is clear that these partial productivity indices need to be used cautiously, with the meaning of each single productivity indicator carefully interpreted in each application.

5.2.2 Total factor productivity

For the above reasons, much attention has been given to measures of total factor productivity (TFP), which is defined as the output quantity produced by a weighted aggregate of certain input units. There are two prominent methods for applying the economic theory of production functions to estimate the input weights, and hence to estimate TFP. The first uses arithmetic weights, derived from index number theory, and related techniques to develop the appropriately weighted input and output indices. This approach has long been used in economics, but was brought to prominence by the work of Kendrick (1961). The second method uses geometric weights derived from production functions of the Cobb-Douglas form, and was given impetus by the work of Solow (1957). The index number approach has been widely used for comparative analysis of TFP levels and growth rates, and will be used in this thesis for this purpose. Supply approaches based on Cobb-Douglas production functions will be used to assess the MC of Vietnam relative to the ASEAN-4 and to analyse the impact of various factors of production on productivity (see Section 8.5).

For time series analysis of TFP of a firm *i* or an industry *i*, the most popular Tornqvist-Theil index or the discrete Divisia chained is used with the reference being the information of that firm or industry in the previous or base time t_0. The two terms summed over time, ranging from time *t* to t_0, provide the chain link component. The TFP index for firm *i* at time *t* relative to firm *i* at time *t-1* is computed as:

$$\ln TFP_t^i = (\ln Q_t^i - \ln Q_{t-1}^i) - \sum \frac{1}{2}(\alpha_t^i - \alpha_{t-1}^i)(\ln X_t^i - \ln X_{t-1}^i) \quad (1)$$

Divisia chaining thereby has limitations in cross-section comparison work at merely a certain time point *t*. To overcome this, Caves et al. (1982) "construct a hypothetical firm whose subcomponent expenditure shares are the arithmetic mean expenditure shares for all firms and whose subcomponent quantities are the geometric means of the subcomponent quantities across all firms" (Pesaran and Schmidt 1997, p. 21). The TFP growth-differential or TFP index for firm *i* at time *t* is given by:

$$\ln TFP_t^i = \left(\ln Q_t^i - \overline{\ln Q_t}\right) - \sum \frac{1}{2}(\alpha_t^i - \overline{\alpha_t})\left(\ln X_t^i - \overline{\ln X_t}\right) \quad (2)$$

where $\overline{\ln Q_t}$, $\overline{\ln X_t}$, $\overline{\alpha_t}$ are respectively the average level of output (quantities), input factor *j* (expenditures), and the shares of that factor of the firms, measured by the arithmetic mean of the corresponding variables of all firms at time *t*. The approach described by equation (2) is appropriate for cross-section analysis. Here TFP_t^i growth is TFP differential or in other words, TFP index is the relative TFP level of firm or industry *i* at time *t* relative to the 'average' firm or industry also at time *t*.

The Kendrick method (2) is selected to estimate TFP indicators at the firm, industry and national levels in this thesis. The input factors for each firm *i* include labour, intermediate material goods and the stock of fixed capital. The share of labour input is the ratio of total payments to labour to the output value of firm *i*, and the share of material goods is the ratio of total materials cost to the total output value of that firm. This measure assumes constant returns to scale, and so the share of fixed capital is estimated as:

1 - (share of labour + share of intermediate material goods).

The approach used to estimate the cost shares of each input is similar to that used by Aw, Chung and Roberts (2003) and by Yeaple and Golub (2007).

For a panel approach involving both time series and cross-section, the Divisia "chain" is linked with Cave's hypothetical firm. The TFP index is constructed as the combination of equation (1) and (2):

$$\ln TFP_t^i = \left(\ln Q_t^i - \overline{\ln Q_t}\right) + \sum_{s=2}^{t}\left(\overline{\ln Q_s} - \overline{\ln Q_{s-1}}\right) \tag{3}$$
$$-\left[\sum_j \frac{1}{2}\left(\alpha_{ij}^i + \overline{\alpha_{ij}}\right)\left(\ln X_{ij}^i - \overline{\ln X_{ij}}\right) + \sum_{s=2}^{t}\sum_j \frac{1}{2}\left(\overline{\alpha_{sj}} + \overline{\alpha_{s-1j}}\right)\left(\overline{\ln X_{sj}} - \overline{\ln X_{s-1j}}\right)\right].$$

The method based on equation (3) is used by Aw, Chung and Roberts (2003). In this thesis, time series estimates of the TFP indicators are not used, and so the method based on equation (3) is not required.

TFP is regarded as an indicator explaining output growth not just by quantitative input factors, such as the number of employees and the stock of capital, but by the effectiveness with which qualitative production factors, such as technology, labour skills, firm organization and managerial capacity, are combined with input factors within the firm. TFP thereby is a special indicator of productivity, since it is not only used as a comprehensive index of productivity but as the determinants of competitiveness.

5.2.3 Overall competitiveness index

The overall competitiveness (OC) index reflects a broad definition of competitiveness, being used by all well-known organizations such the WEF, IMD and UNIDO. Thus for benchmarking OC of manufacturing in Vietnam an index is constructed as the weighted aggregation of two groups of indices, competitiveness performance and driver. Due to different measures, each component needs to be converted to a correspondent score as

percentage which is the comparative to a basic competitor so that the two single indices can be summarised in an overall index.

The overall competitiveness indicator formulated in this study is constructed as the average of total cost competitiveness being the performance indicator and total factor productivity representing the driver indicator. The weights of each type of indicator obtained from the regression of the impact of TFP on total cost efficiency in 2002 and 2005, is analysed in Chapter 7.

$$OMC = \frac{1}{2}(TC\ index + TFP\ index)$$

For Chapter 8, labour productivity is used instead of TFP for two reasons. First, there are no available statistics to calculate TFP in the same year for all Vietnam and the ASEAN-4. Second, labour productivity has the similar distribution shapes as indicated in Chapter 6 and Chapter 7.

It is notable that, the growth of all productivity indicators and competitiveness determinants is calculated by the compound growth rate which is appropriate for the intermittent years 2000, 2002 and 2005.

5.3 Factor determinants of manufacturing competitiveness

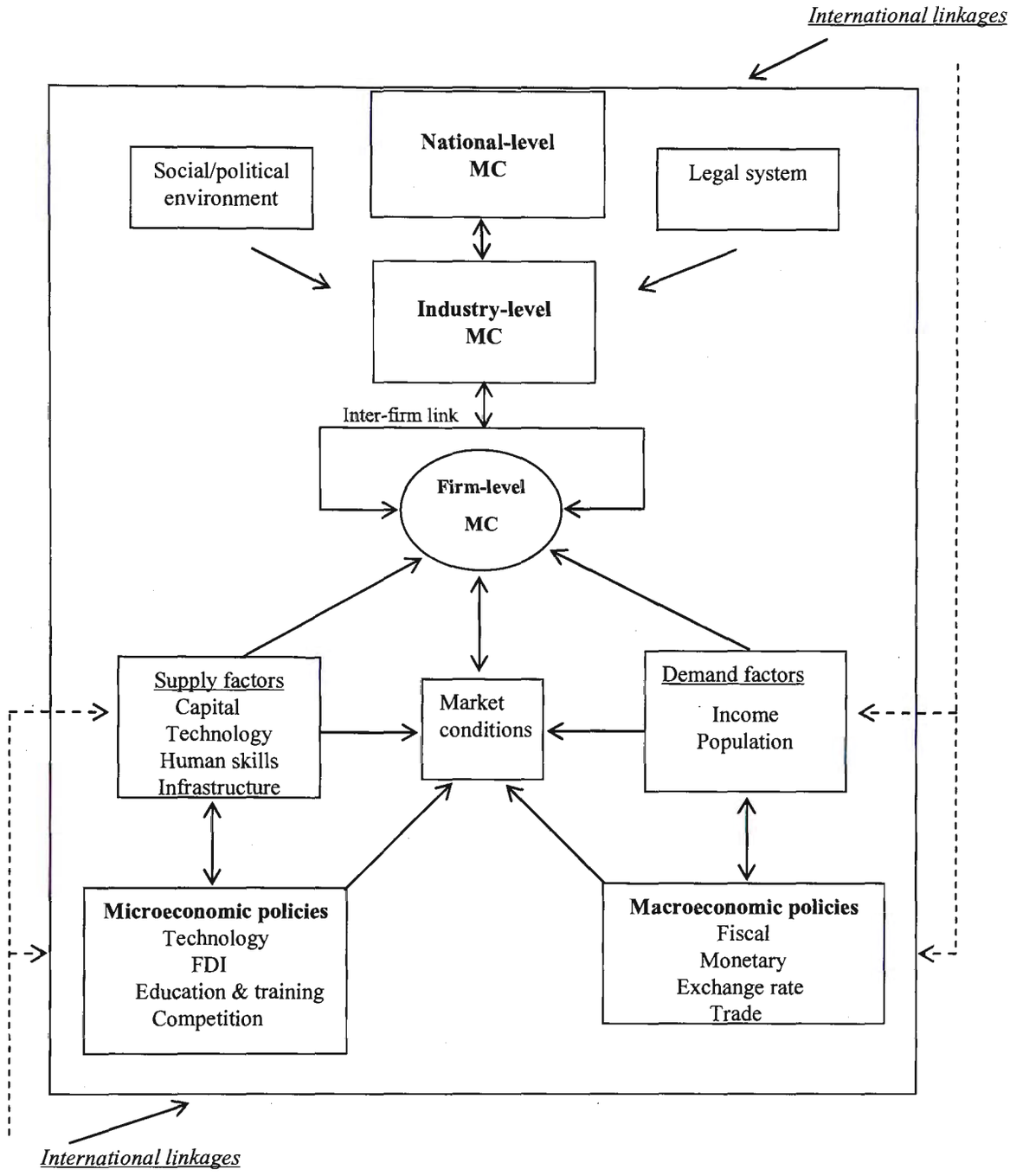
5.3.1 Broad conceptual framework

Studies such as the *Global Competitiveness Report* (WEF 2008) and the *World Competitiveness Yearbook* (IMD 2008) highlight a large number of variables as affecting national competitiveness. Porter (1990, 1998), in two influential studies, provided a "diamond" of competitiveness determinants with four key components – firm strategy and competition, factor conditions, demand conditions and the availability of supporting industries – all of which could be shaped by government policy. His model was consistent with underlying theories of the production function and economic growth. Lall (2003) and other prominent scholars in East Asia focused on technology capability, FDI and relevant public policy as the key factors for competitiveness,

especially in late industrializing countries. Drawing on these themes, the broad conceptual framework to be used here is summarised in Figure 5.1.

National competitiveness in manufacturing ultimately depends on the competitiveness of firms, although as Porter points out the quality of their relationships may be important. For competitiveness at the firm level four factors are distinguished, which in turn shape the conditions in which firms operate: on the demand side, income and population growth and macroeconomic policies, and on the supply side the level and quality of the factors of production and government policies to shape the competitiveness of firms. Here we take the macro level demand conditions as given, and focus on two aspects: the factor determinants of competitiveness and the role of policy in influencing competitiveness at the firm and industry level.

Figure 5.1 Summary of conceptual framework



5.3.2 Comparative analysis

The method of comparative analysis is applied within all chapters. For the past three chapters, it has been used to identify commonalities and diversities within industrialization patterns, different types of competitive advantage and the industry polices applied in countries such as Japan and the NICs, which may be replicable in the context of Vietnam. For the forthcoming chapters, comparative analysis is also used as a key method to evaluate and benchmark the relative manufacturing competitiveness

levels of different firms in Vietnam, and of Vietnamese industries and sectors by comparison with the countries of ASEAN-4. The comparisons of policy practices over the 1986-2005 period in Vietnam as a latecomer with those of the first and the second-generation NICs will also be undertaken, to evaluate the evolution of, as well as limitations of, policies to promote manufacturing competitiveness that have been practiced in Vietnam.

5.3.2.1 Correlation analysis

Correlation analysis is used to test the degree of interactions between a competitiveness indicator and each potential determinant factor, such as fixed capital, wage levels, the number of personal computers used and connected to networks, ownership type, firm size, R&D personnel and expenditures, and so on. The results of correlation analysis are also used to examine the potential for multi-collinearity between variables, and hence for deciding which variables can be employed in the regression models.

5.3.3 Regression analysis of the factor determinants of competitiveness

The starting point for the analysis is a standard Cobb-Douglas production function:

$$Y_{ia} = A_{ia} K_{ia}^{\alpha} L_{ia}^{\beta} M_{ia}^{\gamma} \qquad (4)$$

where constant returns to scale are not assumed, so that it may be the case that $\alpha + \beta + \gamma > 1$.

Here, for industry *i* in country *a* (Vietnam or ASEAN-4), A_{ia} is total factor productivity (excluding economies of scales), Y_{ia} is value-added, K_{ia} is the net value of the fixed of capital stock, L_{ia} is total number of employees and M_{ia} is the value of intermediate inputs. Based on this production function the following method is used to test the impact of various factors determinants on firm-level MC. A similar method was used by authors such as Lee (1996) and Causa and Cohen (2006).

In principle labour input should be adjusted for skill and other quality determinants, so that the labour input is the quality adjusted input (LH) and other quantitative and qualitative input factors may also affect output. Thus (4) is extended to:

$$Y_{ia} = A_{ia} K_{ia}^{\alpha} (LH)_{ia}^{\beta} M_{ia}^{\gamma} Z_{ia}^{\phi} e^{ia}, \quad (5)$$

where Z_{ia} is a vector of other factor inputs, e_{ia} is an error term and again it may be the case that $\alpha + \beta + \gamma + \varphi > 1$. As discussed below, adequate data on the quality of labour engaged in Vietnamese manufacturing is not available, and hence the quality of labour is represented by the wage rate paid. Thus (5) becomes:

$$Y_{ia} = A K_{ia}^{\alpha} (W)_{ia}^{\beta} M_{ia}^{\gamma} Z_{ia}^{\gamma} e^{ia}, \quad (6)$$

where W*ia* represents total wage payments made by industry *i* in country *a*. After taking logarithms, this becomes:

$$\ln Y_{ia} = A_{a1} + \alpha_{ia} \ln K_{ia} + \beta_{ia} \ln W_{ia} + \gamma_{ia} \ln M_{ia} + \phi_{ia} \ln Z_{ia} + \varepsilon_{ia}, \quad (7)$$

and this is the central equation estimated to test the impact of various factor determinants of competitiveness. The vector Z includes a range of other supply-side production factors including use of personal computers, which is connected to the land and to the internet, and the approach can be extend to include export activity and R&D related variables. In different analyses undertaken, the following variables are included within the vector Z.

The dependent variables used three regressions based on equation (7) and are one or the other of the three most comprehensive competitiveness indicators: labour productivity (value-added per employee), cost efficiency (value-added per unit of total cost) or total factor productivity (TFP). Thus, for example, by dividing all variables by the number of employees, equation (7) can be transformed into:

$$\ln y_{ia} = a_{ai} + \alpha_{ia} \ln k_{ia} + \beta_{ia} w_{ia} + \gamma_{ia} m_{ia} + \varphi_{ia} z_{ia} + \varepsilon_{ia}, \quad (8)$$

where the lower case variables represent per employee versions of the variables in equation (7), and hence y_{ia} is value-added per employee in industry *i* in country *a*.

To test variations in competitiveness across firm size and ownership, these regressions can be run for all Vietnamese manufacturing firms at a given time, with dummy variables for firm size and ownership type, or they can be run on groups of firms defined by firm size and/or ownership types.

A similar model can be used (following Pilat 1996) to examine the effects of disparities in production and technology factor levels between two countries on their relative levels of manufacturing competitiveness, at a sector or industry level. Starting from equation (6), deleting the material cost item (for which cross-country data are not available), using E_{ia} to represent a vector of factor demand variables other than capital and quality adjusted labour, dividing the resulting equation for country *a* by that for country *b* and taking logs gives:

$$\ln\left[\frac{Y_{ia}/L_{ia}}{Y_{ib}/L_{ib}}\right] = T_{ab} + \alpha_{ab}\ln\left[\frac{K_{ia}/L_{ia}}{K_{ib}/L_{ib}}\right] + \beta_{ab}\ln\left[\frac{W_{ia}/L_{ia}}{W_{ib}/L_{ib}}\right] + \gamma_{ab}\ln\left[\frac{E_{ia}/L_{ia}}{E_{ib}/L_{ib}}\right] + \varepsilon_{ab} \qquad (9)$$

where T*ab* is a measure of the relative technology and related conditions in countries *a* and *b* as indicated by the relative TFP. Equation (9) can then be used to study the impact of different factor conditions in the two countries on the relative labour productivity by industry in the two countries.

5.3.4 Policies influencing manufacturing competitiveness

In neoclassical growth models of the Solow-Swan type, the long-run steady state of GDP per capita is a function only of the level of technology, broadly defined, and not of the rate of growth of capital stock or labour supply. But, for a given country with output per capita levels far from its steady state, it is likely to take a long while to achieve that level. If technology or policy changes lead to an increase in the steady state level of output per capita, this will lead to an increase in the transitional rate of growth towards

the new steady state. Thus models have been developed in this framework (e.g. Lee 1996; Barro and Sala-i-Martin 1991, cited in O'Mahony et al. 1996) in which the rate of growth of a developing country (one far from its steady state), is related positively to variables generating a higher steady state level and, negatively to the opening level of the relevant state variables, such as output per worker or capital stock per worker. This latter negative relationship reflects diminishing returns to growth, so that the higher the opening levels the lower the rate of growth towards the new steady state.

Thus we can use an equation of the form:

$$Y_{it} = \beta_{it} + \gamma X_{it} + \phi Z_{it} + U_{it} \qquad (10)$$

to examine the influences of government policies, including enterprise income tax and tariffs, on the competitiveness of the sector. Here Y_{it} represents the growth rate of output or of labour productivity in industry i in year t; X_{it} represents the initial levels at $t = 1$ of the state variables of industry i (e.g. labour productivity measured by value-added per employee or capital stock measured by fixed capital per employee); Z_{it} is a set of policy variables, including enterprise income tax and tariff rates; and U_{it} is a disturbance term.

5.4 The data

5.4.1 The general features of the database

To examine competitiveness as demonstrated by productivity, it is preferable to use long-term time series data since productivity, especially at firm level, may be volatile in the short run, due to the influence of the business cycle and of product composition changes (Wagner and Ark 1996, 1999). However, for Vietnamese manufacturing, the long-term data that are available consist only of basic industry-level statistics, such as the number of employees, capital stock and output value. These aggregate data do not permit detailed analysis and may be misleading. For example, given the substantial role of material inputs which are transformed to create output value, the value of output may be a misleading indicator of actual productivity and competitive strength. While some time series analysis is undertaken in this thesis, the focus is primarily on cross-section

analysis using the detailed data on firms and industries that has been obtained from the Vietnamese General Statistics Office (GSO).

Virtually all of the data on Vietnam's manufacturing sector being used in this study are published or unpublished statistics on the total population of manufacturing enterprises in Vietnam (about 22,700 in 2005). The main exception to this is data for value-added, which is not available in the full population database and had to be constructed from sample survey data. This full population database was constructed by theGSO and has been being steadily improved since 1998 with financial and technical assistance from UNIDO and the World Bank. The availability of data and its use is summarised below.

Data at the firm level

Is only available since 2000, based on the results of censuses of all firms conducted annually by the Vietnamese GSO with technical and financial assistance from the World Bank. For the first time, this collection provides data at the firm level, with a range of indicators available (except value-added), with variables cross-classified by enterprise size, ownership and industry province of operation.

Data at the industry level and at the national level is available as follows

1986-1999: The Vietnam GSO's Statistical Book of Industrial Statistics provides 20 years of data on basic indicators, such as the number of employees and the value of capital, including fixed capital, and output value, by two-digit level industries. However, for 1986-1990 the industries have not been completely classified according to UNIDO ISIC revision 3, but for 1990-1999 they are so classified. For the first time in 1998, manufacturing data including value-added at the four-digit industry level, was published by the GSO with assistance from UNIDO.

2000-2005: UNIDO statistics at the four-digit industry level. Value-added figures are only available for 2000.

5.4.2 Value-added

For the analysis of MC, value-added is an important indicator which is only available in full population statistics, at the four-digit industry level with initial assistance from

UNIDO in 1998 and 2000. From this year until the present, value-added has not been an official statistics indicator at the detailed industry level in Vietnam, with only aggregate manufacturing value-added available from the National Accounts data. It has therefore been necessary to estimate manufacturing value-added at the firm-level in 2000, and for all levels in 2002 and 2005, on the basis of the sample survey of firms conducted by the Vietnamese GSO in the corresponding years. The number of firms in the 2002 and 2005 sample surveys correspondingly constituted 25 and 14.5 percent of the total number of manufacturing firms.

Value-added can be measured as gross output less material inputs. Thus, to estimate value-added created by each two-digit industry in the year 2002 and 2005, we assume that the average ratio of material inputs to gross output of each industry in the population of firm is equal to that ratio in the surveyed sample. Thereby, firstly we calculate the input-output ratio of each industry, basing directly on UNIDO statistics for the year 2000 and indirectly on the sample survey for the years 2002 and 2005. That ratio is the mean of all input-output ratios of all surveyed firms operating in that industry. We then assume that all firms in a given industry have the average input-output ratio for this industry, and multiply the output value for each firm in the total population by the estimated average ratio, to obtain total input value and hence value-added in each year. Value-added for different groups of firms, industries or the total manufacturing sector is then the sum of all firms belonging to the group in question. It should be noted that our estimated total manufacturing value-added for the two years 2002 and 2005 differs somewhat from the estimates of GDP and its share by manufacturing sector published in the official Statistical Yearbook, because of the different methods employed.

As a result, for each year 2000, 2002 and 2005 we have both firm, industry and value-added data sets, each of which have their own strengths and shortcomings. The value-added data in the samples are observed, actual data, but only for a certain part of the total population. Thus there maybe large deviations from the actual population means, especially when the sample share is small as in case of non-SOEs in 2005 (except for joint-stock enterprises). The second set of value-added demonstrate value-added of the whole population, nonetheless, these figures are estimated based on the industries' mean

ratio, thus also probably deviated far from the actual mean, especially for firm ownerships.

Given such data limitations, in order to more accurately assess Vietnam manufacturing competitiveness at all levels and by each criterion, every index (used for the years is presented and compared on the basis of both the sample survey data and the population data with the estimated value-added series.

Another significant limitation of the database is that statistics are not available for some important indicators relating to manufacturing competitiveness, such as manufacturing export and imports, and the skill level of employees, which are not available at the level of desegregation required.

5.4.3. Price deflator

Virtually all of the input and output variables in the database are measured in terms of the Vietnamese dong at current prices, so that the selection of an appropriate indicator of inflation is necessary to calculate their value and growth rate in real terms. For firm-level data, the year 2000 was selected as the base year and the values of the indicators in the following years were deflated by the industrial output or producer price index (PPI). This series is provided in the Vietnam *Statistical Yearbook*, both for the manufacturing sector as a whole and for all two-digit industries within manufacturing. Capital stock employed needs to be deflated by a general rather than an industry specific price measure, and so the manufacturing price index is used to obtain the real value of capital stock. The output value of a given firm is deflated by the PPI index for the two-digit industry within which it operates.

Deflating firm value-added is more complicated, as in principle it requires producer price indices not only for output but also for inputs, such as a materials price index (MPI). However, while such indices are available in several countries like the US and Germany (O'Mahony, Wagner and Paulssen 1996), they are not available in Vietnam statistics. So estimated value-added in current prices is also by the industry-specific PPI for a given firm, to obtain an estimate of real value-added. This will be a biased measure to the extent to which input and output prices show different rates of growth.

For industry-level analyses, all types of values are measured by US dollars in order to be able to compare input and output indicators across countries. Using this procedure effectively means that the indicators are not adjusted for local inflation rates but to two other things: the exchange rate relative to the US dollar, which fluctuates to different degrees between different countries, and the rate of inflation in the US.

In addition, the inflation and relevant tasks for calculating indices are not the large issue of this thesis. As indicated in the thesis's title, research questions and methodology in the previous sections, the thesis's underlying analysis work devoted to deriving indices of and effects of determinants on competitiveness indicators at all levels in same year. The firm-level results will be achieved by comparative and regression analysis methods based on which of either input or output indicators in one year are compared to each other. These comparative values therefore are affected by a similar deflating degree and did not considerably bias competitiveness index values. The mentioned industry-level data issues are also unavoidable for any cross-country comparative analysis, not resulting in a large deviation in competitiveness indices and the corresponding correlation and regression results.

5.4.4 The approaches for data by firm category

Data by firm category, size or ownership, can be used in two ways. The first namely in terms of the total quantum of a given variable (e.g. capital, employees or value-added) contributed by firms of a given firm category. That is, for example, they show the rate of growth in the average real value-added per firm for firms in the 50-199 employees category over the period 2000-05. The second shows the change in the average characteristics of the firms within a given size category. The former focuses on the characteristics of the total contribution of all the firms in each size or ownership cell, measuring the total growth and contribution of all firms of that firm and sector category. This approach also is used for estimation and analysis of the growth and contribution of each firm size, ownership category to total manufacturing sector.

The latter focuses on the characteristics of the average firm in each size or ownership cell and has the advantage of correcting for the changing number of firms in each size

cell as well as reflecting precisely competitiveness at firm-level. This approach is applied for estimation and analysis of all firm-level competitiveness indices and corresponding relative competitive positions of firm in different size or ownership categories.

5.4.5 Proxy of labour skills

To quantify the skill levels of employees, the preferred course is to use specific measures (such as educational and trade qualifications) to express by the technical skill levels embodied in a particularly group of employees. But in practice for the period from 2000 there are neither GSO statistics nor a large, adequate survey available for Vietnam on this matter. As a result, and in line with the procedure used by other authors such as Smith (2000), average wage per employee is used as a proxy indicator for labour skills, since this factor should be reflected in the level of the wage paid. The wage differential is likely to reflect labor quality if labor can easily move among enterprises with different ownership (i.e. from SOEs to non-SOEs or FIEs and vice versa), or if the structure of wage are similar. But in reality these conditions are not meet in some cases in Vietnam.

CHAPTER 6
FIRM-LEVEL MANUFACTURING COMPETITIVENESS BY SIZE

6.1 Introduction

The size of a firm and its effect on performance was not a research issue in Vietnam before the economic reform towards a more market-oriented economy was undertaken. This was due to the widespread acceptance of a simple orthodoxy, based on the Soviet Union model, that the larger the firm the better its performance would be. Small and medium-sized enterprises (SMEs) were thereby viewed as temporary forms of firm organization, prior to moving on to becoming large-sized enterprises (LEs).

The role of firm size, and especially the role of SMEs, has been paid some attention by economists, government policy makers and business organizations since the early 1990s, as a result of the significant development and contribution of SMEs to the Vietnamese economy. This work has been supported by theoretical advice and financial assistance from several international economic organizations. A considerable number of workshops have taken place to identify the criteria for classifying an enterprise as an SMEs. In 1998 in Vietnam the criteria were established as employing below 200 employees or having a total capital amount below 5 billion dong. In 2001, the thresholds for classifying an enterprise as an SME were increased to 300 employees and 10 billion dong of capital.

Given the history of limited studies on firms in Vietnam in general, and on firm size in particular, the objectives of this chapter are to analyse the role, production factor characteristics and competitiveness patterns of manufacturing firms within different size categories in Vietnam. These research objectives are achieved by providing preliminary answers to the following questions:

- How did firms in the different size categories, measured by both the number of employees and the level of capital criteria, grow over time, and to what extent did firms of different sizes contribute to the total output of the manufacturing sector?
- What are the characteristics of the underlying traditional production factors and new drivers of competitiveness of firms with different sizes?
- Is it a fact, and if so under what conditions, that LEs constitute the stronger sector, with firms within the largest size category showing the strongest performance and those in the smallest size category showing the weakest performance?
- How does competitiveness differ across firm size and industry type?

The structure of this chapter is organized to answer these questions in turn.

6.2 Growth and the structural contribution of firms by size

6.2.1 Growth rates

6.2.1.1 The criteria for classifying enterprises by size in Vietnam

As compared to counterparts in regional countries, SMEs in Vietnam have a lower average amount of capital but employed a number of employees which equal to that of the Philippines or Thailand, higher than Indonesia or Malaysia, and smaller than Singapore or Australia (Harvier 2002). It should be mentioned that the number and characteristics of firms classified as SMEs on the employee criterion are unlikely to be exactly equivalent to those of firms classified as SMEs on the basis of the capital criterion. Such differences between the results of applying the two criteria are apparent for many countries. The two criteria are typically positively correlated but whether or not they give the same result will depend on the technical characteristics of each industry.

For the manufacturing sector in Vietnam, the difference in the numbers of SMEs calculated by using each of two criteria has been increasing, with the largest disparity showing for the number of the medium size firms (firms employing between 50 and 200 employees or owning up to five billion dong in capital). But overall the difference in number of firms classified as SMEs or LEs remains small for the sectors as a whole.

This suggests that the two selected thresholds to distinguish SMEs and LEs (capital of ten billion dong and 300 employees) were relatively rational in Vietnam in 2001. The effect of both criteria change over time, with the classification of firm size based on the capital criterion likely to change most rapidly, reflecting many factors such as the larger average size of newly established enterprises, inflation rates and rapid growth in the capital base of existing firms.

6.2.1.2 Growth rates for selected variables, by firm size (employee criterion)

Table 6.1 provides information on the annual average growth rates of selected variables for total firms in each size category in the manufacturing sector in Vietnam over the 2000-05 period, using the second method. Other than for the number of firms and the number of employees, the data are in constant 2000 prices (for details see Chapter 5). Several major trends in the pattern of enterprise growth can be identified from these figures. Firstly, during the five-year period of 2000-05, the number of firms in all size categories grew rapidly, and most categories experienced relatively rapid growth in both inputs and outputs in real terms, with growth rates generally in the 15-20 percent per annum range. These trends can be partly attributed to the impact of the Law of Enterprises which came into effect in the year 2000, and which eased the conditions for establishing new firms and offered a more equal playing field for privately-owned enterprises, most of which were SMEs.

Secondly, for SMEs the highest growth rates were recorded for total capital employed and for gross output, while for LEs tax payment and value-added increased most rapidly (20.3 percent and 19.6 percent). Overall SMEs growth rates relative to LEs were higher, both on an average firm and an all firm basis, for input and gross output variables but were lower for value-added and tax revenue. With the exception of the number of firms, the number of employees was the slowest growing variable for both size sectors. It is notable, however, that for the very largest firms (those with 5000 or more employees) the growth in employment over the five year period was very high, at 23-24 per annum.

Thirdly, within SMEs the number of firms employing between 10 and 49 employees increased most rapidly and firms in this category had the highest growth rate in many variables, especially for gross output and value-added. The smallest size category, those

with less than five employees, showed the most uneven growth rates with 32.1 percent and 8.6 percent in terms of capital and tax revenue respectively. But these figures should be treated with caution, both because very small firms in all economies tend to be unstable, and because data on such small firms tends to be unreliable, since they are based on reports from firm managers, most of whom had low education and training levels. The high growth rates of all variables except gross output for the largest firms (those with 5000 or more employees) is also notable.

Table 6.1 Average annual growth rates by firm size (%), 2000-2005, in real terms

Firm size (number of employees)	Number of firms	Total capital	Number of employees	Gross cutput	Value-added	Tax payment
<5	16.7	32.1	16.4	18.0	25.9	8.16
5-9	17.5	25.0	17.6	8.6	17.1	11.3
10-49	20.4	24.5	19.8	22.9	25.8	33.0
50-199	14.9	20.1	14.3	18.8	17.2	13.4
200-299	11.1	12.5	11.2	17.9	15.1	11.3
SMEs	**17.8**	**18.9**	**14.8**	**18.9**	**18.1**	**15.6**
300-499	11.2	12.1	11.1	17.2	15.3	19.9
500-999	12.4	17.6	13.1	21.3	20.9	23.9
1000-4999	12.4	17.5	12.4	19.2	20.0	17.5
>5000	21.5	23.7	23.2	13.1	23.3	31.6
LEs	**12.0**	**16.8**	**13.8**	**18.8**	**19.6**	**20.3**
Total	***17.2***	***17.5***	***14.1***	***19.6***	***19.2***	***19.9***

Source: Author's estimation based on Vietnam GSO' unpublished data from annual enterprise surveys and UNIDO *Industrial Statistics* database.

6.2.2 Structural changes by sector and firm size

As we can see in Table 6.2 the first striking feature of the contributions by different firm sizes to total input and output is the marked contrast between the share of each size category in total number of firms and in total input and output. This is inevitable given the quite different structural roles played by firms in the SMEs and the LEs sectors.

On the one side, in both years SMEs represented well over 80 percent of the total number of enterprises but contributed around 30 percent of the total input factors, capital and labour, and of gross output and value-added. The contrasting structural feature of SMEs is exemplified in the case of the firms in the 10-49 employees category. Such firms accounted for the largest proportion of the total number of firms,

42 percent in 2005, but their role remained limited, contributing only about 5-6 percent of total employment, capital, value-added and tax revenue.

Table 6.2 Contributions of different firm sizes (%), 2000 and 2005

Firm size (number of employees)	Number of firms		Capital		Labour		Output value		Value-added		Tax revenue	
	2000	2005	2000	2005	2000	2005	2000	2005	2000	2005	2000	2005
<5	6.1	5.9	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
5-9	20.1	20.0	0.7	1.0	0.9	1.1	1.6	1.6	1.0	0.9	0.6	0.4
10-49	36.3	42.0	4.7	6.2	5.5	7.0	5.7	5.7	4.7	5.9	3.3	5.7
50-199	21.2	19.0	18.0	19.9	14.4	14.5	16.7	16.2	16.9	15.2	16.6	13.1
200-299	4.8	3.7	9.7	7.8	7.8	6.8	8.8	8.2	9.3	7.7	10.2	7.4
SMEs	**88.5**	**90.7**	**33.1**	**35.1**	**28.7**	**29.5**	**33**	**32.1**	**32.0**	**29.8**	**30.7**	**26.6**
300-499	4.8	3.7	16.0	12.8	12.3	10.7	12.8	11.7	13.9	11.2	13.1	13.7
500-999	4.0	3.2	20.0	20.4	18.0	17.2	17.8	19.1	19.3	19.7	22.8	28.0
1000-4999	2.6	2.1	26.0	26.4	32.8	30.4	29.3	31.8	29.3	33.0	32.7	30.8
>5000	0.1	0.2	4.1	5.3	8.3	12.2	7.1	5.4	5.5	6.3	0.6	0.9
LEs	**11.5**	**9.2**	**67.0**	**64.9**	**71.4**	**70.5**	**67**	**67.9**	**68.0**	**70.2**	**69.2**	**73.4**
Total	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***

Source: As for Table 6.1.

On the other side, whereas LEs accounted for only about 10 percent of total firm numbers, these firms contributed over two thirds of total employees, capital, gross output, value-added and of payments to the budget. Of LEs, those of the 1000-4999 employees size represent a typical case with their share in number of firms at only 2.6 percent in 2000, but that in capital, employees, value-added and tax revenue being the largest of any size category, around 30 percent.

Secondly, the SMEs share of the total increased over the period from 2000 to 2005 for number of firms, capital and employment, but declined for the output variables, while the shares of LEs moved correspondingly in the opposite direction. Even so, and contrary to the position in many developed countries, LEs remained the major source of employment in manufacturing, providing 70.5 percent of employment in only 9.2 percent of the firms in 2005, with those firms also providing 70.2 percent of value-added. Thus in spite of the rapid growth in the number of SMEs and in their use of factors of production, Vietnamese manufacturing remains heavily dependent on LEs.

Thirdly, across the five firm size categories within SMEs, it is relative surprising that the greatest contributor across all variables was not from the largest firms but the

second largest, followed by the third largest. The position of the largest firms in the overall manufacturing sector remains distinctive – accounting for only 0.2 percent of firms in 2005 they nevertheless employed 12.2 percent of all employees and produced 6.3 percent of value-added.

It is noteworthy that, the structural role of different firms sizes measured by capital showed largely similar features to those above, as depicted in Appendix Table 6.2. But compared to the shares for variables in the case of firm size measured by number of labourers, those of the SMEs were lower by about fifteen percent for number of firms, higher by around ten percent for employment and more impressively, by more than twenty percent for capital and output indices.

6.3 Characteristics of underlying competitiveness determinants of firm in different size categories.

6.3.1 Supply-side production factors

Table 6.3 shows intensity levels of the underlying production factors across different firm sizes, measured by the average amount of each factor per employee, including the real value of fixed capital employed, real income, number of personal computers (PCs) connected to land systems and of those connected to internet. Two remarks can be made from these figures, as noted below.

Firstly, in terms of changes from 2000 to 2005, for all firm sizes employees have been assisted with a greater number of PCs connected to land systems and have been paid at higher rates over the period. But in terms of fixed capital per employee, SMEs and LEs have moved in opposite directions, with the former on average showing a rising capital intensity and the latter showing capital intensity falling significantly. Indeed, for all firm categories above 10-49 employees, except for the second largest size, usage of fixed capital has grown less rapidly than employment, so that fixed capital per employee has fallen. Secondly, despite the mentioned higher ratios of equipment or payment per employee, SMEs and each small firm size was still featured by virtually all poorer equipment indicators than LEs, except number of PCs per employee in the year 2005.

Table 6.3 Average intensity level of underlying production factors by firm size, 2000, 2002 and 2005

Firm sizes (number of employees)	Mean (standard deviation)								Number of observations	
	Fixed capital/ employee (millions dong)		Income/ employee (millions dong)		PC lan/1000 employees		PC net/1000 employees			
	2000	2005	2000	2005	2002	2005	2002	2005		
<5	91.9	138	9.03	11.8	10.5	24.4	31.3	56	580	995
	(304)	(485)	(49.9)	(21.9)	(96.2)	(229)	(128)	(250)		
5- 9	59.4	70.2	6.6	9.49	7.84	19.8	19.5	32.5	1962	3882
	(321)	(262)	(7.83)	(10.1)	(63.2)	(110)	(63.9)	(104)		
10-49	60.7	68.2	7.44	10.4	13.2	27.9	16.3	33.2	3661	8716
	(199)	(196)	(7.51)	(9.27)	(68)	(92.2)	(45.7)	(81.9)		
50-199	93	91.2	10.4	12.7	23	37.8	15.7	30.4	2203	4282
	(282)	(236)	(10.2)	(11.1)	(72.1)	(86.1)	(59.3)	(67.9)		
200-299	99.7	86.2	11.3	13.9	21	39.4	11.3	27	500	834
	(248)	(146)	(9.26)	(10.1)	(53.4)	(70.5)	(34.2)	(49.8)		
SMEs	**69.8**	**78.9**	**8.09**	**11**	**15**	**29**	**17.3**	**33.5**	**8906**	**18709**
	(262)	**(242)**	**(15.4)**	**(11)**	**(69.3)**	**(106)**	**(59.2)**	**(99.4)**		
300-499	110	96.3	11.7	14.2	22.7	37.5	24.3	25.5	496	841
	(608)	(283)	(9.68)	(10.7)	(68.1)	(77.7)	(363)	(66.7)		
500-999	102	101	12	14.7	19	35.3	24.5	21.1	409	730
	(484)	(308)	(10)	(10.6)	(45.7)	(65.8)	(406)	(46.4)		
1000-4999	64.2	72.7	11.8	14.9	14.7	29.1	45.8	15	268	487
	(194)	(206)	(7.77)	(10)	(38.9)	(48)	(502)	(21.4)		
>5000	43.9	41	11.8	13	9.69	21.4	2.21	7.36	15	37
	(31.8)	(33.2)	(4.46)	(4.48)	(9.56)	(17.3)	(2.65)	(8.3)		
LEs	**100**	**91.5**	**11.8**	**14.5**	**19.3**	**34.5**	**29.4**	**21.2**	**1188**	**2095**
	(494)	**(274)**	**(9.35)**	**(10.4)**	**(54.6)**	**(67)**	**(413)**	**(51.6)**		
Total	***75.9***	***79.4***	***8.72***	***11.3***	***15***	***29.5***	***48.3***	***32.3***	***10094***	***20804***
	(298)	***(246)***	***(14.9)***	***(11)***	***(68)***	***(103)***	***(155)***	***(95.7)***		

Source: As for Table 6.1.

Looking at the factor intensity ratios for each firm size, except the smallest, it is evident that the distribution of fixed capital per employee has a nearly normal or bell curve shape. The highest levels are to be found for the medium and upper-medium sizes, from 50-999 employees, with lower levels of capital intensity above and below this range. It sounds paradoxical that, as the data shows, the largest firms had the lowest fixed capital equipment ratio and the smallest firms showed the highest ratio. As noted earlier, the data for very small firms must be treated with caution. It needs to be kept in mind that this pattern of capital intensity may be influenced by the choice of firm size measure, which here is not capital but number of employees, so that the largest firm is the one with the largest number of employees. Hence it may be the case that many large firms

by this measure are labour-intensive ones, in labour-intensive industries. Additionally, in a plant or firm, a certain number of machines, depending on their technical characteristics, may be used with a range of employees, so that fixed capital required does not increase proportionally with number of employees. In such cases, the largest number of employees may be associated with the lowest fixed capital/employee ratio.

Turning to the ratio of payment per employee as a major proxy for skill levels, the average wage per employee in SMEs reached around 69 percent that of LEs in 2000 and 76 percent by 2005. Nonetheless, unlike contrasting pattern of capital intensity, the lowest paid groups were the second and third smallest, while the highest paid were the second and third largest in both 2000 and 2005. The gap between the lowest and the highest in terms of the wage/employee ratio or skill intensity also decreased significantly during 2000-05: payments per employee in the lowest category were 55 percent of those in the highest in 2000 and 65 percent in 2005.

Firms in Vietnam have been looking to use information and communication technology as a new type of competitive advantage. In the use of such technology SMEs in general stood behind LEs with regard to PCs connected to land-based systems, although the gap narrowed between 2000 and 2005, but were much more intensive in use of the internet. The higher status of LEs by the former indicator can perhaps be attributed to the greater demand for equipment-assisted communication within larger, complex firms, although usage is low in the very largest firms. The smaller firms, by contrast, have used the internet to enrich their information, diversify partners and expand firm networks to compensate for limitations of scale in terms of labour force and equipment. Indeed, the smallest firms had by far the greatest use of the internet. It should be noted that not only did SMEs have on average approximately 50 percent higher ratios of PCs connected to the internet per employee than LEs, but each of the small and medium firm size categories came well ahead of the three largest firm size categories by this indicator.

6.3.2 R&D pattern of firm

The R&D personnel intensity levels of different firm sizes, measured by ratio of R&D personnel to total employees, are depicted in Table 6.4. To begin with, for all firm sizes,

the share of R&D personnel in total employees tended to decrease between 2000 and 2002, as growth in R&D personnel did not keep pace with the growth in employees. Somewhat surprisingly this ratio was higher for SMEs than for LEs in both survey years, as a result of a generally higher researcher-employee ratio in each small size category as compared to each large size category, except for the smallest group with less than five employees. It should be noted that both the smallest and largest size group had the smallest ratio of researchers per total employee, followed by the second largest size category in both survey years. Again surprisingly, the proportion of R&D personnel in the second smallest size category (5-9 employees) was higher than in all larger firm sizes in both years and was the highest in any category in 2002, being around three times higher than that of the second largest firm size.

Table 6.4 Cross-size share of R&D personnel in total employees, and composition of R&D personnel by degree (%), 2000 and 2002

Firm sizes (number of employees)	R&D personnel per employee (% of employee)		Assoc. Diploma share (% of R&D personnel)		Bachelor share (% of R&D personnel)		Master share (% of R&D personnel)		PhD share (% of R&D personnel)	
	2000	2002	2000	2002	2000	2002	2000	2002	2000	2002
<5	1.04	2.02	0	50	100	50	0	0	0	0
5- 9	1.52	1.27	10.9	2.92	77.2	80.8	4.18	6.33	7.73	3.83
10-49	0.88	0.82	12	14.8	85.1	78.9	2.61	3.8	0.29	2.27
50-199	1.07	0.71	11.8	13	86.9	83.6	0.52	1.86	0.79	0.75
200-299	1.01	0.61	10.2	11.3	88.4	88	1.18	0.04	0.23	0.71
SMEs	**1.04**	**0.87**	**11.5**	**12.9**	**86.5**	**82.4**	**1.22**	**2.42**	**0.81**	**1.39**
300-499	0.86	0.66	11.5	21.3	87.2	78.2	1.15	0.35	0.16	0.04
500-999	0.81	0.53	17.6	8.77	81.7	90.3	0.51	0.69	0.21	0.19
1000-4999	0.57	0.41	10.6	14.5	88.8	84.3	0.47	1.14	0.09	0.07
>5000	0.09	0.06	46.1	12.5	53.9	86.6	0	0.34	0	0.24
LEs	**0.76**	**0.55**	**13.4**	**12.1**	**85.7**	**86.9**	**0.74**	**0.83**	**0.16**	**0.16**
Total	***0.99***	***0.81***	***12.2***	***12.6***	***86.2***	***83.9***	***1.05***	***1.36***	***0.57***	***0.97***

Source: As for Table 6.1.

With respect to the distribution of researchers by qualification, across all firm sizes those with bachelor degrees dominated, providing 86.2 percent of total R&D personnel in 2000 and 83.9 percent in 2002, followed by associate diploma holders, providing 12.2 percent in 2000 and 12.6 percent in 2002. The proportions of R&D personnel holding the different postgraduate degree qualifications were, of course, much smaller. However, while SMEs share in total associated diploma holders rose 3 percent and that of bachelors reduced correspondingly within two years, the opposite changes in R&D staff occurred for LEs. SMEs had a larger share of researchers holding postgraduate

degrees as compared to LEs in both years 2000 and 2002. The second smallest size also possessed the highest percentage of Master and PhD degree-holding researchers, above three times and four times higher than the average levels of all firm sizes correspondingly. On the other firm size end, the largest and second largest firm sizes indicated the least-intensive R&D by the lowest researcher-employee ratios in 2002. R&D features of these firm size categories thereby were consistent with those of other production factors, indicated in the previous section.

This R&D personnel distribution by firm size appears to differ from that common in developed economies. But this R&D pattern may be partly attributable to the fact that in Vietnam a number of PhD holders established small firms in higher technology industries such as chemicals and then directly engaged in and managed R&D activities in these firms. While this also occurs in developed countries, the context in Vietnam is of a considerable number of large firms, being either wholly FIEs or private limited domestic firms operating in resource or labour-intensive, low-technology industries, which undertake very little technological innovation, thereby having a correspondingly low ratio of R&D researchers to total employees.

R&D intensity is also widely analysed by two other important indicators, the ratio of R&D funding to total sales and distribution of spending on R&D activities between technology innovation and technology acquisition. The former covers the direct, independent research including process, product technology, minor and major innovation and the latter covers the indirect activities involved in acquiring and applying new technologies, such as purchasing of patents, royalty payments and the installation of modern equipment.

As indicated in Table 6.5, and by contrast to the position as shown by the personnel indicator, SMEs generally have lower ratios of R&D expenditure to sales than LEs. The former's ratio of R&D spending over sales was, respectively, about two-thirds and a half of that of the latter in 2000 and 2002, and tended to fall for SMEs while that of LEs increased. As evaluated by R&D personnel, the smallest and the largest were similar in the sense that both devoted very little funds for R&D.

Table 6.5 Ratio of R&D expenditure to total sales and the composition of R&D, by firm size, 2000 and 2002

Firm size (number of employees)	R&D/ total sales		Direct R&D/ total		Indirect R&D/ total	
	2000	2002	2000	2002	2000	2002
	(% of sales)		(share of total R&D, %)			
< 5	0.00	0.06				
5-9	0.56	0.58	19.9	32.2	80.1	67.8
10-49	0.32	0.37	29.9	27.4	70.1	72.6
50-199	0.42	0.46	36.0	26.4	64.0	73.6
200-299	0.42	0.36	40.0	41.0	60.0	59.0
SMEs	**0.41**	**0.38**	**36.5**	**30.0**	**63.5**	**70.0**
300-499	0.64	0.65	27.8	39.5	72.2	60.5
500-999	0.44	1.05	44.6	42.3	55.4	57.7
1000-4999	0.96	0.46	28.2	38.2	71.8	61.8
>5000	0.00	0.29				
LEs	**0.64**	**0.73**	**41.0**	**41.5**	**59.0**	**58.5**
Total	***0.44***	***0.44***	***35.9***	***33.5***	***64.1***	***66.5***

Source: As for Table 6.1.

With regard to the distribution of R&D spending, it is evident that all firm sizes had more than half of their total R&D expenditure going to technology acquisition in both years. SMEs had a lower emphasis on innovation, with a lower percentage spent on technology innovation than LEs. Additionally, for SMEs the share spent on acquisitions rose between 2000 and 2002 while that of LEs fell marginally. As a result the share of SME spending on innovation was 11.5 percentage points lower than that of LEs in 2002. Of all firm sizes, the 500-999 employees size (the third largest category) was the most innovative, since this firm size had the highest R&D/total sales ratio in 2002 and the highest proportion of innovation in total R&D expenditure (44.6 percent and 42.3 percent in 2000 and 2002 respectively).

Turning to the source of R&D funding, displayed in Table 6.6, self-raised funding is the most important source for all firm sizes, with the self-raised share ranging from over 50 percent to over 80 percent in both surveyed years. Nonetheless, there are still significant differences with regard to the importance of state funding of R&D expenditure. For LEs, the government funding share of around 20 percent was the second largest funding source, but for SMEs this type was merely the third, coming after loans from banks which were the second most important. Moreover, the proportion of state funding in total R&D spending for LEs increased from 15.6 percent to 24.1 percent between 2000 and 2002, while that of SMEs decreased from the low rate of 13.4 percent to only 8.1

percent. As a result the share of R&D funded from state sources was more than three times greater for LEs than for SMEs by 2002. This mechanism also contributed to a widening self-raised funding disparity between LEs and SMEs from 11.3 percent up to approximately 17 percent, since the latter had to spend more of their earned sources and bank loans on R&D activities.

Table 6.6 Sources of R&D expenditures across firm sizes (%), 2000 and 2002

Firm size (number of employees	State		Firm		Foreign		Loan	
	2000	2002	2000	2002	2000	2002	2000	2002
	(Share of total for each firm size in each year, %)							
5-9	6.3	5.0	66.6	81.3	16.5	5.0	10.7	8.7
10-49	6.1	2.9	82.9	78.2	0.0	0.0	11.0	19.0
50-199	10.8	7.6	67.8	68.9	1.1	0.0	20.3	23.5
200-299	31.3	19.6	68.7	61.7	0.0	2.6	0.0	16.1
SMEs	**13.4**	**8.1**	**70.3**	**72.0**	**0.5**	**0.8**	**15.8**	**19.1**
300-499	2.1	23.3	67.0	56.6	0.0	0.0	30.9	20.2
500-999	18.3	24.2	60.7	60.3	2.3	0.8	18.6	14.7
1000-4999	11.0	29.2	57.4	52.7	1.5	0.8	30.1	17.3
LEs	**17.2**	**25.1**	**52.4**	**56.6**	**4.3**	**0.5**	**26.0**	**17.8**
Total	***12.8***	***15.2***	***65.1***	***65.4***	***2.1***	***0.7***	***20.0***	***18.7***

Source: As for Table 6.1.

6.3.2 Distribution of firm numbers by broad industry and firm size

One important feature of Vietnam's industrial structure, which both helps to explain the pattern of capital intensity by firm size noted in relation to Table 6.3 and some of the competitiveness features discussed below, is the distribution of firms by size across industries. Table 6.7 demonstrates the features of the SME and LE sectors, the two ends of the firm size spectrum and of medium sized firms with respect to three broad industry sectors within manufacturing. Among all firms, labour-intensive ones had the largest share of 48.9 percent in 2000, but there was a strong shift to resource-intensive firms, which by 2005 accounted for 46.6 percent of all firms. Over the five-year period the proportion of labour-intensive firms within the SME sector dropped by around 10 percentage points, and the resource-intensive firms became the most dominant, accounting for nearly a half of total number of such firms. In LEs, the share of the labour-intensive firms dropped by around 4 percentage points, but this was due to a corresponding rise in the share of capital-intensive firms.

Table 6.7 Distribution of firm number in each industry group for every firm size (%), 2000 and 2005

Firm size	Labour-intensive		Resource-intensive		Capital-intensive	
<5	82.7	60.4	14.8	29.9	2.42	9.72
5- 9	64.4	42.5	26.9	44.3	8.65	13.2
10-49	36.2	29	48.7	53.5	15.1	17.5
50-199	30	32.2	50.5	48.7	19.5	19.1
200-299	41.1	38.2	42.3	41.4	16.6	20.5
SMEs	**44.5**	**34.37**	**41.5**	**48.94**	**14**	**16.69**
300-499	47.8	46.3	34.8	33.9	17.4	19.8
500-999	46.3	53.9	39.1	25.4	14.6	20.7
1000-4999	78.4	66.2	12.8	14.1	8.79	19.7
>5000	78.4	81.6	12.8	5.26	8.79	13.2
LEs	**58**	**54.01**	**26.7**	**25.57**	**15.3**	**20.42**
Total	***48.86***	***36.34***	***36.96***	***46.59***	***14.18***	***17.06***

Source: As for Table 6.1.

Across firm sizes, both the smallest and largest had a very high proportion of labour-intensive firms, around 80 percent in the year 2000. But during 2000-05, for firms employing less than 5 employees, the share of those operating in labour-intensive industries fell by over 20 percentage points, but that in the resource-intensive industries rose by 15 percentage points. Thus for the very smallest firms, and for SMEs more generally, there was a sharp shift from labour-intensive to resource-intensive industries over this period. By contrast, the share of firms employing 5000 or more employees operating in labour-intensive industries increased by 3.3 percentage points, to reach 81.6 percent by 2005. The upper-small and medium firm size, 10-49 and 50-199 employees, had the lowest proportion of labour-intensive firms and the highest proportion resource-intensive ones. Both upper-medium sizes, 300-499 and 500-999 employees, also had below-average ratios of labour-intensive firms to total and the highest share of the capital-intensive firms.

This distribution of firms of different sizes across industries helps to explain the different levels of competitive advantage in term of fixed capital, wages and R&D by firm size. For the largest firms, the very high and rising involvement in labour-intensive industries throws light on their low capital intensity, relatively low income per employee and low PC use (Table 6.3). In addition, the dominance of labour-intensive industry technology characteristics also provides a reason for the lack of R&D being a high-order competitive advantage within both the smallest and largest size firms.

6.4 Competitiveness indices of firm in different size categories

6.4.1 Labour productivity and capital productivity

6.4.1.1 Labour productivity

Labour productivity indices by firm size (measured in terms of numbers of employees) are presented in columns 2 to 5 of the upper panel of Table 6.8. The first characteristic noted is the relatively high annual growth rates of labour productivity, of around 8 percent in most cases, for both SMEs and LEs during the five years 2000-05. The second largest and the smallest firms showed the highest growth rates of 12.7 percent, while productivity among the largest firms grew by only 3.7 percent. However, the figures for the smallest, employing less than 5 employees, need to be evaluated cautiously since these firms normally lack professional accountants, so that their data as reported on the survey may not be entirely accurate.

Second, SMEs had both a slightly lower growth rate during the five-year period than LEs and were characterised by a lower average ratio of value-added per employee in both 2000 and 2005. Moreover over the five year period the extent of SMEs' relatively lower productivity tended to increase, with the differential rising from only 2.84 million dongs per employee in 2000 to 9.4 million dong in 2005, an increase of nearly fourfold.

Table 6.8 Annual growth rates (%) in 2000-05 and average levels of competitiveness across firm size (continued on the next page)

Firm size (number of employees)	Mean (standard deviation) Value-added per employee (million dongs at year 2000 prices)			Average annual growth (%)	Value-added/ wage			Average annual growth (%)
	2000	2002	2005		2000	2002	2005	
<5	31.7	66.2	57.6	12.7	4.39	8.68	6.74	8.97
	(138)	(224)	(226)		(14.1)	(30.2)	(25.5)	
5- 9	45	59.1	59.4	5.72	6.95	8.51	7.27	0.91
	(132)	(190)	(291)		(25.6)	(34)	(36.6)	
10-49	33.3	48	52.2	9.42	4.73	6.14	5.67	3.69
	(76.9)	(164)	(169)		(10.7)	(27)	(17.8)	
50-199	44	53.6	61.8	7.01	4.12	4.34	4.74	2.82
	(97.9)	(145)	(159)		(7.73)	(10.4)	(7.64)	
200-299	47.2	57	68.5	7.74	3.9	3.61	4.7	3.82
	(102)	(146)	(153)		(8.2)	(6.95)	(8.26)	
SMEs	**39.2**	**53**	**56.9**	**7.7**	**5**	**5.91**	**5.8**	**3**
	(103)	**(168)**	**(201)**		**(14.8)**	**(25.2)**	**(21.8)**	
300 -499	44.3	51.1	64.6	7.86	3.3	3.23	4.51	6.43
	(97.6)	(125)	(156)		(3.9)	(4.31)	(15.1)	
500-999	43.1	49	74.7	11.6	2.98	3.05	4.23	7.25
	(90.1)	(136)	(211)		(3.28)	(4.2)	(7.54)	
1000-4999	37	41.6	67.3	12.7	2.66	2.88	4.06	8.77
	(59.5)	(79.5)	(138)		(2.85)	(4.96)	(7.08)	
>5000	29	21.6	34.8	3.71	2.28	1.81	2.73	3.65
	(19.6)	(15.6)	(23)		(1.38)	(1.2)	(2.05)	
LEs	**42.1**	**47.7**	**68.2**	**10.1**	**3.04**	**3.06**	**4.28**	**7.04**
	(87.1)	**(119)**	**(172)**		**(3.46)**	**(4.42)**	**(11.1)**	
Total	***39.6***	***52.4***	***58***	***7.95***	***4.77***	***5.8***	***5.65***	***3.43***
	(101)	***(162)***	***(199)***		***(14)***	***(23.7)***	***(21)***	

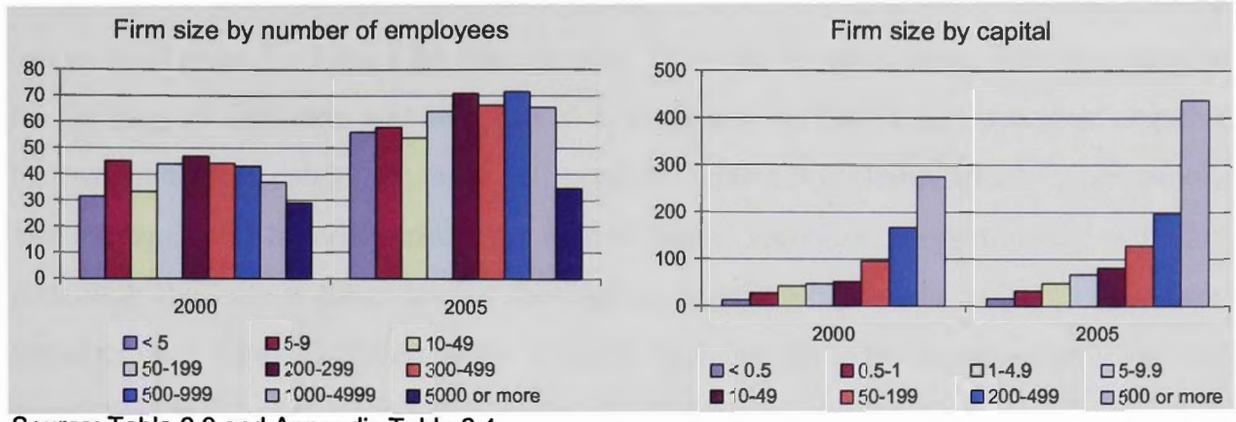
Table 6.8 (continued)

Firm size (number of employees)	Mean (standard deviation) Value -added/capital 2000	2002	2005	Average annual growth (%)	Value-added/ total cost 2000	2002	2005	Average annual growth (%)	Number of observations 2000	2002	2005
<5	0.29	0.33	0.34	3.12	0.18	0.25	0.33	12.7	580	501	995
	(1.14)	(0.94)	(0.86)		(0.13)	(0.07)	(0.54)				
5- 9	0.45	0.44	0.44	-0.3	0.27	0.26	0.32	2.83	1962	2181	3882
	(1.72)	(0.98)	(1.35)		(0.15)	(0.07)	(0.4)				
10-49	0.48	0.44	0.47	-0.6	0.3	0.26	0.32	1.72	3661	4689	8716
	(0.7)	(1.04)	(1.31)		(0.16)	(0.08)	(0.12)				
50-199	0.44	0.39	0.47	1.4	0.32	0.26	0.33	1	2203	2699	4282
	(0.56)	(0.46)	(0.71)		(0.15)	(0.09)	(0.1)				
200-299	0.42	0.4	0.49	3.09	0.34	0.28	0.35	0.17	500	577	834
	(0.55)	(0.52)	(0.53)		(0.1)7	(0.09)	(0.1)				
SMEs	**0.45**	**0.42**	**0.46**	**0.36**	**0.28**	**0.26**	**0.33**	**2.96**	**8902**	**10649**	**18709**
	(1.02)	**(0.89)**	**(1.16)**		**(0.16)**	**(0.08)**	**(0.24)**				
300 -499	0.45	0.38	0.49	1.93	0.34	0.28	0.35	0.91	496	614	841
	(0.48)	(0.38)	(0.58)		(0.16)	(0.1)	(0.1)				
500-999	0.46	0.41	0.5	1.53	0.35	0.29	0.37	1.39	409	489	730
	(0.57)	(0.41)	(0.56)		(0.16)	(0.11)	(0.1)				
1000-4999	0.48	0.4	0.52	1.77	0.32	0.3	0.38	3.35	268	366	487
	(0.45)	(0.31)	(0.38)		(0.14)	(0.12)	(0.11)				
>5000	0.4	0.45	0.52	5.69	0.35	0.32	0.41	3.54	15	21	37
	(0.24)	(0.27)	(0.29)		(0.1)	(0.09)	(0.11)				
LEs	**0.46**	**0.39**	**0.5**	**1.84**	**0.34**	**0.29**	**0.37**	**1.72**	**1188**	**1490**	**2095**
	(0.5)	**(0.37)**	**(0.53)**		**(0.15)**	**(0.11)**	**(0.11)**				
Total	***0.45***	***0.42***	***0.46***	***0.5***	***0.29***	***0.26***	***0.33***	***2.74***	***10090***	***12139***	***20804***
	(0.97)	***(0.84)***	***(1.11)***		***(0.16)***	***(0.09)***	***(0.23)***				

Source: As for Table 6.1.

The lower level of SMEs' labour productivity relative to that of the LE sectors is consistent with the findings from a number studies on SMEs in Singapore and Malaysia during industrialization in these countries. But the fact that the lowest levels of productivity were found in the largest firms in Vietnam over 2000-2005, is similar only to the pattern in Malaysia in 1979, the year of labour-intensive goods exports. Since then, in Malaysia in 1984 and 1988 and in Singapore in 1992, the ratio of value-added per worker has increased with firm size (Hill 1998).

Figure 6.1 Labour productivity by firm size, 2000 and 2005, by two measures of firm size



Source: Table 6.8 and Appendix Table 6.4.

The reason for the relatively normal distribution of value-added per labour across firm sizes in Vietnam can most probably be found in the similar pattern of production factors, as indicated earlier. Both the smallest firms and the largest firms were the least capital intensive and the least innovative. These features of large firms were subsequently related to the nature of the labour-intensive industries in which firms employing largest number of employees were concentrated. But the correlation between firm size and labour productivity is much affected by the size criterion used, and should thus be analysed and compared carefully, taking into account the measurement of the unit of size.

When firm size is categorised by total capital, as shown in the right hand panel of Figure 6.1 and in Appendix Table 6.4, the results are quite different, as the firm size measure has substantial impact on growth, and absolute and relative competitiveness levels across firm sizes. When the capital criterion is used, the ratio of value-added per employee is strongly positively correlated to firm size, so that the larger the firm the higher productivity level it achieved. In addition, the disparity between the productivity levels of the smallest and largest firms is very great, up to about thirty-six time and twenty-six times in 2002 and 2005 respectively, while the corresponding figures were only around twice if firm size is measured by number of employees. This marked differential in the highest-lowest gap in terms of labour productivity is again related to relevant differences with regard to important competitiveness determinants, fixed capital and wages per employee, between the two firm size measures.

6.4.1.2 Capital productivity

Unlike labour productivity, capital productivity (value-added per unit of capital) showed low growth rates for LEs, 1.84 percent over 2000-05, for most large firm sizes except for the largest. This ratio was very low at 0.36 percent for SMEs, and was even negative for two small size categories, as is indicated in Table 6.8 (column 10-12, upper panel). The average ratio of value-added per unit of capital increased proportionally with firm size, with the largest firms having the highest capital productivity in 2005. This even association of total estimated firms is firstly justified by even figures of value-added across firm sizes, since each was calculated averagely by multiplying output to an input-output ratio as stated in the data characteristics in Chapter 4.

But relative capital productivity shows an opposite pattern if firm size is measured by capital, with the smaller firms using capital more productively. This was since capital is negatively correlated with the ratio of value-added per capital, thereby the larger firm size with the greater capital are more likely to lower this ratio.

6.4.2 Wage and total cost competitiveness

6.4.2.1 Wage competitiveness

As for real value-added per employee, real value-added per wage unit increased over 2000-2005 for SMEs and LEs and the latter had its growth rate doubling the former, by 3 percent and 7.4 percent respectively. Additionally, the distribution of wage productivity was different from that of labour productivity, and indeed opposite to that of capital productivity, for firm size measured by number of employees. The smaller the size of the firm, the greater value-added its wage unit can produce; in other words, SMEs used lower wage payments to produce an equal value-added as compared to LEs. This pattern can be explained by two main reasons. Firstly, the firm size criterion is based on number of employees, thereby the larger firm was the more labour-intensive which thereby paid greater total wages. Secondly, these firms were less capital and R&D-intensive, thereby creating lower total value-added as indicated in Section 6.3.2.

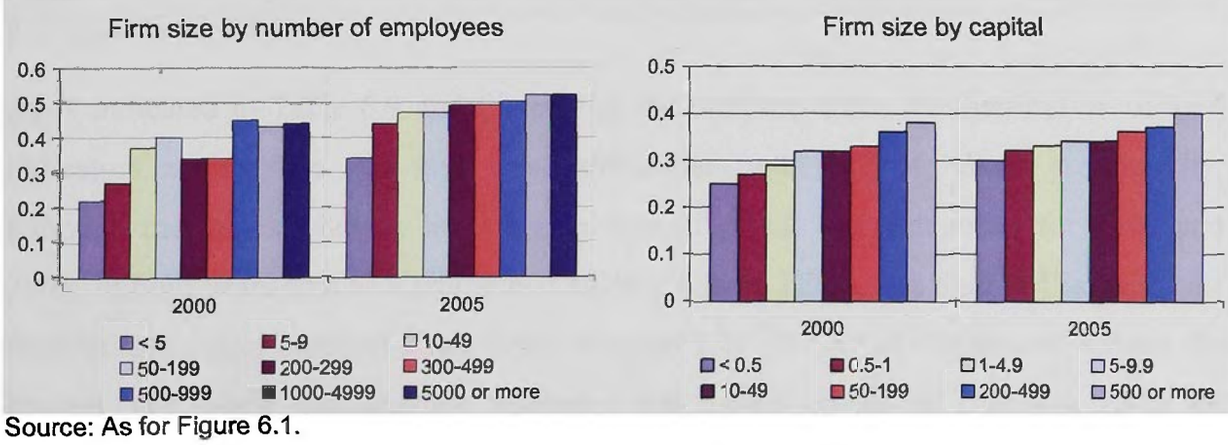
Nonetheless, like capital productivity, wage productivity levels by firm size measured by capital show a quite contradictory pattern to that revealed by use of the employment

criterion. On the capital basis, value-added per wage unit rises strongly with firm size, with the larger firms achieving the highest ratios of value-added per wage unit (Appendix Table 6.4). The justifications for this feature also relate to the characteristics of the firm size measure. In this case the larger sized firms were also the most capital-intensive, and hence used more capital per employee to create value-added from the efforts of a given employee. As a result, their ratio of value-added per wage unit was higher than that of smaller sized firms, and the larger firms made more effective use of a given unit of skill-adjusted labour.

6.4.2.2 Total cost competitiveness

Table 6.8 (columns 14 to 16, lower panel) and Figure 6.3, show that, as with labour productivity, firms of all sizes enjoyed rapid growth in cost efficiency between 2000 and 2005. But the level of cost productivity displayed a markedly different distribution from wage productivity, with the large enterprise (LE) sector and larger firms showing higher cost productivity, or lower average total cost per unit of value-added, as compared to SMEs and small firms. The resulting positive correlation between firm size, measured by number of employees, and cost efficiency levels was consistent with the theory of economies of scale. The contradictory pattern of wage competitiveness and cost competitiveness can be attributed to the very low share of labour cost within total cost, suggesting that not low wages but low material costs played a substantial role in higher total cost efficiency in larger firms.

Figure 6.2 Total cost competitiveness by firm size, 2000 and 2005, by two measures of firm size



Source: As for Figure 6.1.

Again the distribution of cost competitiveness ratios across firm size measured by capital is of considerable interest. In this case, and unlike the different results for the two size measures for previous competitiveness indicators, the total cost competitiveness pattern across firm size is similar when firm size is measured by number of employees or by capital. The result for the capital measure is what one would expect in theory – that for a given level of total cost, firms using a higher amount of capital tend to produce higher value-added or in other words have a greater cost efficiency.

6.4.3 Total factor productivity and overall competitiveness

6.4.3.1 Total factor productivity

Table 6.9 Distributions of TFP and overall competitiveness across firm sizes, 2000, 2002 and 2005

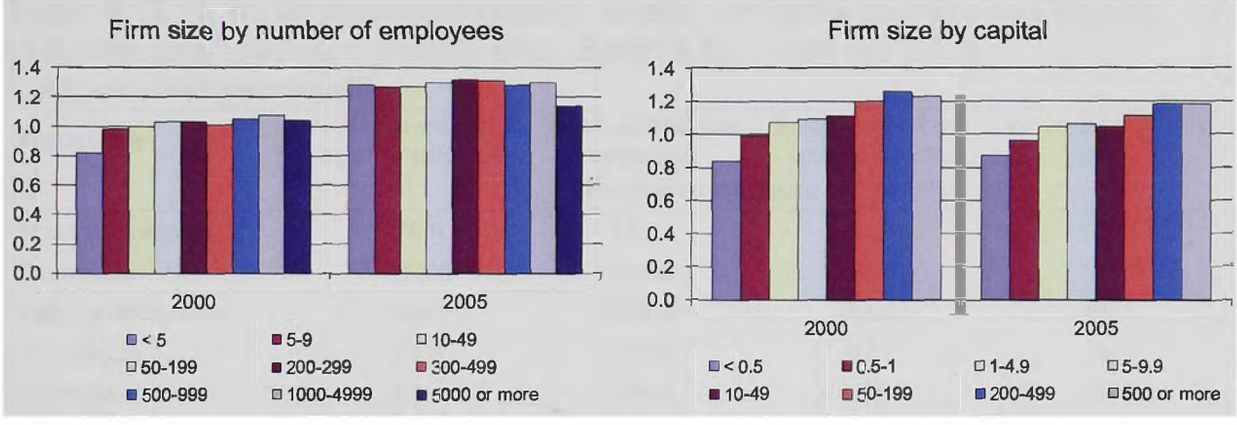
Firm size (number of employees)	TFP level			Relative TFP (%)			Overall competitiveness (%)		
	2000	2002	2005	2000	2002	2005	2000	2002	2005
<5	0.82	0.93	0.93	79	98.2	88.9	64.7	88	89
5- 9	0.98	1	0.97	94	106	93.4	78.1	93.2	98
10-49	1	1.01	1.03	96	107	98.4	89.9	93.7	101
50-199	1.03	1.02	1.03	99	108	99	94.9	95.4	103
200-299	1.03	1.03	1.03	99	109	98.8	88.3	98.3	105
SMEs	**1**	**1.02**	**1.01**	**96**	**108**	**97.1**	**79.6**	**95.1**	**100**
300 -499	1.01	1.02	1.02	97	109	98.3	86.4	98.9	105
500-999	1.05	1	1.04	101	106	100	101	98.7	104
1000-4999	1.08	1.02	1.08	104	108	103	100	101	107
>5000	1.04	0.94	1.04	100	100	100	100	100	100
LEs	**1.04**	**1.02**	**1.04**	**100**	**108**	**100**	**87.8**	**99.6**	**105**
Total	***1***	***1***	***1***	***96***	***106***	***95.9***	***88.9***	***94.1***	***101***

Source: As for Table 6.1.

As is indicated in Table 6.9 and Figure 6.3, by both measures the distribution of TFP indicators across firm size had some similarities with that of labour productivity, although the largest show a level higher than all small size categories for 2000 and 2005. In both years LEs as a whole had slightly higher TFP levels than SMEs, with the medium and upper medium-sized firms, measured by number of employees, having the highest TFP while the smallest displayed the lowest levels of TFP. By 2005 the differences across firm size were smaller, except for the very smallest firms whose TFP was 17 percent below the all firm average.

With size measured by capital (Figure 6.3), the pattern of TFP across different firm sizes shares common features with the other competitiveness indices shown on this basis in Figures 6.2 and 6.3. In both years 2000 and 2005, TFP increased consistently with firm size and in that year the gap between TFP for the largest and for the smallest firms was greater than that in the case of firm size measured by number of employees. There is thus considerable evidence that Vietnamese manufacturing competitiveness increases with size, when size is measured by capital, but this is not true when size is measured by number of employees.

Figure 6.3 Total factor productivity by firm size, 2000 and 2005, by two measures of firm size



Source: As for Figure 6.1.

6.4.3.2 Overall competitiveness

Table 6.9 displays overall competitiveness indicators across firm sizes which were constructed as the average sum of two most important and comprehensive competitiveness indices, cost efficiency as performance outcome and total factor productivity as the driver, for the three years 2000, 2002 and 2005. The competitiveness positions depend strikingly on the type of firm size measure used.

If the firm size measure was selected as number of employees, on average LEs demonstrated stronger competitiveness than SMEs and of all firm sizes, the second largest pronounced as the strongest and the smallest displayed as the weakest in 2002 and in 2005. In the case of firm size being measured by capital, either indicator of the two approaches in both of the years 2002 and 2005, confirmed LEs as the stronger

sector and the largest sized firm owning at least 500 billion dongs rank as the strongest. These ranks directly resulted from these firm sizes relevant positions with respect to total cost efficiency as analysed earlier.

6.4.4 Competitiveness of firm size sectors by group of industries

Table 6.10 shows the relativity between SMEs and LEs for four competitiveness indicators and for both measures of firm size. The value in any given indicator/industry cell is the value of that indicator for SMEs in that industry, relative to the value for LEs for that indicator and industry set equal to 100. It is thus a measure of the position of SMEs relative to LEs for that indicator in that industry.

Table 6.10 Ratio of competitiveness levels for SMEs relative to LEs, by industry and measure of firm size (SMEs/LEs = 100 for each indicator/industry cell)

Industries	Value-added per employee	Value-added per wage unit	Value-added per unit of capital	Value-added/total cost
		Employee measure of firm size		
Food & beverage	78.9	157.0	94.4	100.0
Garments	173.0	139.0	88.5	104.0
Labour-intensive	**126.0**	**204.0**	**91.3**	**89.1**
Chemicals	51.9	108.0	91.5	100.0
Fabricated metal	84.4	104.0	136.0	99.6
Resource-intensive	**66.0**	**107.0**	**133.0**	**93.9**
Automobiles	16.5	30.5	112.0	86.0
Furniture	84.7	120.0	91.4	95.8
Capital-intensive	**52.2**	**80.8**	**100.0**	**92.0**
Total	***86.0***	***136.0***	***91.0***	***91.3***
		Capital measure of firm size		
Food & beverage	38.4	66.0	123.0	95.0
Garments	78.5	81.2	129.0	94.2
Labour-intensive	**46.2**	**79.7**	**133.0**	**88.9**
Chemicals	17.9	40.9	109.0	96.0
Fabricated metal	28.4	46.3	165.0	93.3
Resource-intensive	**30.4**	**57.9**	**179.0**	**93.7**
Automobiles	29.2	66.5	110.0	95.4
Furniture	49.5	78.5	125.0	91.5
Capital-intensive	**25.9**	**53.5**	**138.0**	**92.6**
Total	***35.0***	***65.9***	***152.0***	***91.0***

Notes: 1: Value-added/labour. 2: Value-added/wage. 3: Value-added/capital. 4: Value-added/total cost. 5: TFP.
Source: As for Table 6.1.

The overwhelming feature that can be noted from the Table 6.13 is that the relative competitiveness levels between firms of different sizes depends substantially on the industry in which the firm operates, whether firm size is measured by the number of employees or by capital, and also on the competitiveness measure used. The competitiveness disparity between SMEs and LEs was largest for the labour productivity indicator within the more technology and capital-intensive industries such as chemicals and automobiles.

If size is measured by number of employees, the results show that, as compared to the average relative competitiveness level between the two size groups for the entire manufacturing sector, SMEs' labour productivity was higher than LEs for the labour intensive-group, but lower for the resource-intensive and for the capital-intensive groups. SMEs' cost efficiency relative to the latter also pointed greater for the intermediate-good industries and the resource-intensive industries.

SMEs operating in the garment industry had higher absolute competitiveness levels than LEs for three of the four comprehensive indicators, and the competitiveness of SMEs in the food and beverage sector was also strong. In contrast, SME labour productivity in the automobile industry equaled only one-sixth that of LEs, and was more than 80 percent lower than the average level for the whole manufacturing sector.

Even though the SME/LE competitiveness ratios are generally lower when firm size is measured by capital, the relativity between this ratio and the all manufacturing ratio is relatively similar for the three groups of industries and for the automobile industry on the two size measures. The SME/LE ratio was higher for the garment industry than that for all manufacturing for three of the four competitiveness indicators including cost efficiency.

In short, in terms of labour productivity SMEs had either higher absolute competitiveness than LEs (employee criterion) or higher competitiveness than LEs relative to the manufacturing average (capital criterion) for labour-intensive industries, but much lower competitiveness than LEs for capital-intensive and technology-intensive industries. For total cost efficiency, this relative competitiveness of SMEs was higher than the average level for resource-intensive and capital-intensive industries.

6.5 Key findings and overall conclusions

The tables and the analysis above reveal, for the first time to our knowledge, a complex and interesting picture of the role of firm size in the structure and growth of Vietnamese manufacturing. Some of the main trends that have emerged are pulled together below.

1. *Distribution by firm size.* Over the period 2000-05 there has been rapid growth in the number of SMEs in Vietnam but that trend to SMEs is not so pronounced for key input and output variables. Both total fixed capital and the number of employees grew somewhat faster for small and medium-sized firms, but value-added continued to grow more rapidly in larger firms.

2. *Patterns of capital intensity and of other production factors.* Contrary to normal thinking capital intensity (measured by real fixed capital per employee) showed a bell-shaped curve across the size distribution. The most capital intensive firms were in the middle of the size distribution (those with 50-1000 employees) while the larger firms were less capital intensive by this measure. In both cases these levels were below that of SMEs as a whole. Thus one critical feature of Vietnam's industrial structure appears to be relatively low capital intensity, on average, among the largest firms in case labour is a firm size measure.

   A similar pattern is evident in some other important inputs to production. In 2002 the ratio of R&D to total sales was highest in firms with 300-999 employees, and significantly below the overall average in both larger and smaller firms. Use of PCs (not networked) per employee showed much the same pattern, while use of networked PCs per employee declines steadily with firm size.

3. *Industry distribution by firm size.* These differences reflect in part the types of industries in which firms of different size are engaged. A high proportion of LEs, and especially of the largest firms, are in labour intensive industries, such as food, beverage and garment production, whereas SMEs have a much higher share in resource-intensive industries (such as chemicals and metal fabrication). In contrast only a small proportion of the largest firms are in capital intensive industries, such as automobiles and furniture manufacture.

4. *Labour productivity and capital productivity.* The productivity of labour (real value-added per employee) is heavily influenced by the level of capital per worker, and also shows a bell-shaped curve with firm size. The firms with the highest level of labour productivity in 2005 are those with 200-999 employees, and productivity in both larger and smaller firms is below the all-firm average. Again the largest firms had labour productivity only about one half of the average in 2005, and productivity growth in these firms for the period 2000-05 was lower than in any other size grouping.

   Value-added per unit of capital is the measure of capital productivity used, but its inverse is also often used as a measure of capital intensity. Hence it is difficult to distinguish efficiency in the use of capital from the capital intensity of the activities being undertaken. In 2005 value-added per unit of capital increased steadily with size, and was highest in the largest firms. Given that these firms had lower than average capital intensity (as measured by capital per employee) it is likely that they were the most efficient in using capital.

5. *Cost-based measures of productivity.* The main difference between these measures value-added per unit of wage cost and value-added per unit of total cost relates to the use of intermediate inputs, so that the gap between the first and the second will be greater when there is heavy use of intermediate inputs. The value-added/wage ratio falls steadily with rising firm size, whereas the value-added/total cost ratio rises with increasing firm size. This may reflect both greater efficiency in managing total costs and a rising reliance on intermediate inputs in larger firms.

6. *Total factor productivity and overall competitiveness.* The analysis of TFP by firm size leads to two main conclusions. TFP and overall competiveness increased virtually consistently with firm sizes in both 2000 and 2005 if firm size is measured by capital. But in time only for most firm sizes, except for firms employing between 300 and 500 workers and for the largest category with at least 5000 employees, in the case of firm size measured by number of employees.

7. *Relative performance by firm size and industry type.* The relative competitiveness of small and large firms varies across industry types. Using value-added per employee as the productivity measure, SMEs in the labour intensive garment industry are considerably more productive than LEs. However, in most other industries, and especially a capital intensive one such as automobiles, LEs are much more productive.

8. *Competitiveness levels by capital size measure.* The conclusions above mainly relate to firm size as measured by number of employees. Some important differences of both competitiveness drivers and performance are found if the data are analysed in terms of firm size defined by total capital. The labour productivity, TFP distribution had a bell-shape for competitiveness indicators of firm sizes measured by number of employees, but these increased strongly uniformly with firm size. Wage competitiveness and the capital productivity pattern had opposite patterns between the two measures. On the basis of number of employees, the strongest by labour productivity and TFP index was the firms of upper-medium size or 500-999 employees, but by cost efficiency index it turn to be the second largest-size firm. Nonetheless on the basis of capital, competitiveness of firms markedly increased with size by virtually all competitiveness indicators, except capital productivity.

9. *Different results delivered from four single competitiveness indices and firm size measures.* On the basis of one competitiveness index, the competitiveness results differed significantly between two firm size measures. Also by a similar firm size measure, distribution patterns varied between competitiveness indices and even were opposite for capital productivity and wage competitiveness. Theoretically, these results suggest that to assess relative competitiveness of firms across different size categories, in particular within an industrializing economy, one should use more comprehensive indices and take in to account different firm size measures.

Appendix Table 6.1 Number of firms, employees, capital, gross output and estimated value-added across firm sizes at the year 2000 current price, 2000 and 2005

Firm size (number of employees)	Number of firms		Number of employees ('000 persons)		Capital (billion dong)		Gross output (million dong)		Estimated value-added (billion dong)	
	2000	2005	2000	2005	2000	2005	2000	2005	2000	2005
<5	626	1354	2.1	4.4	270	1089	386	883	61	192
5-9	2077	4648	14.2	32.1	1615	4924	4363	6580	640	1412
10-49	3743	9462	84.1	207.6	10709	32046	15141	42430	3009	9467
50-199	2183	4379	221.8	432.5	41134	102652	44410	104981	10778	23805
200-299	496	840	120.1	204.3	22380	40406	23348	53230	5936	12015
SMEs	**9125**	**20683**	**442.3**	**880.8**	**76108**	**181117**	**87648**	**208104**	**20424**	**46891**
300-499	496	844	189.6	320.5	37308	66165	34056	75365	8864	18034
500-999	409	733	277.6	512.7	46735	105217	47207	123737	12306	31780
1000-4999	270	485	506.0	908.6	60691	135873	77785	187046	18691	46513
>5000	14	37	128.0	363.5	9337	27093	18941	35026	3538	10087
LEs	**1189**	**2099**	**1101.2**	**2105.2**	154071	334347	177989	421174	43399	106414
Total	***10314***	***22782***	***1543.6***	***2986.1***	***230180***	***515465***	***257417***	***629278***	***63822***	***153306***

Source: As for Table 6.1.

Appendix Table 6.2 Contribution of different firm sizes (capital size measure)

Firm size (billion dongs)	Number of firms (%)		Capital (%)		Labour (%)		Output value (%)		Value-added (%)	
	2000	2005	2000	20 05	2000	2005	2000	2005	2000	2005
< 0.5	29.7	13.9	0.34	0.13	3.04	1.3	0.83	0.23	0.64	0.22
0.5 - 1	12.9	15.1	0.39	0.37	2.05	2.07	1.11	0.5	0.75	0.47
1 - 4.9	24.5	35	2.54	2.7	10.5	8.74	5.17	3.74	4.4	3.47
5 -9.9	8.06	10.1	2.62	2.38	8.62	6.25	4.19	2.91	3.91	2.75
SMEs	**77.7**	**74.1**	**5.9**	**5.58**	**24.2**	**18.4**	**11.3**	**7.38**	**9.7**	**6.91**
10 -49	14.1	16.3	14.5	12.5	29.6	23.9	16.9	12.9	16.9	12.4
50 - 199	6.11	7	27	23.2	25.7	27.2	29.7	23.7	28.3	23.4
200 - 499	1.13	1.78	15.2	18.2	8.95	14.4	14.9	19.2	15.6	18.7
> 500	0.76	0.86	37.5	40.5	11.6	16.2	27.1	36.9	29.4	38.6
LEs	**22.3**	**25.9**	**94.1**	**94.4**	**75.8**	**81.6**	**88.7**	**92.6**	**90.3**	**93.1**
Total	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***

Source: As for Table 6.1.

Appendix Table 6.3 Relative competitiveness indices across firms by size (%), 2000, 2002 and 2005 (5000-employee size = 100)

Firm size (number of employees)	Value-added/ employee			Value-added/ wage			Value-added/ capital			Value-added/ total cost		
	2000	2002	2005	2000	2002	2005	2000	2002	2005	2000	2002	2005
<5	109	331	161	191	501	247	73.3	73.9	64.9	50.2	77.8	64.9
5-9	155	271	167	303	447	267	113.0	98.3	84.3	62.0	80.1	84.3
10-49	115	223	155	208	333	208	122.0	99.3	89.8	83.8	80.7	89.8
50-199	151	252	184	180	237	174	112.0	87.9	90.7	90.2	82.8	90.7
200-299	162	285	204	171	208	172	108.0	90.7	94.6	77.6	87.9	94.6
SMEs	**135**	**265**	**167**	**219**	**341**	**213**	**114.0**	**94.6**	**87.8**	**63.6**	**82.2**	**87.8**
300-499	152	255	190	145	178	165	113.0	84.5	94.0	76.0	89.4	94.0
500-999	149	233	206	131	167	155	117.0	90.9	95.7	102.0	91.4	95.7
1000-4999	128	198	188	116	159	149	121.0	88.9	100.0	96.8	93.4	100.0
>5000	100	100	100	100	100	100	100.0	100.0	100.0	100.0	100.0	100.0
LEs	**145**	**238**	**194**	**133**	**169**	**157**	**116.0**	**87.9**	**96.2**	**76.0**	**91.4**	**96.2**
Total	***136***	***248***	***169***	***209***	***320***	***207***	***114.0***	***94.5***	***88.6***	***81.6***	***82.2***	***88.6***

Source: As for Table 6.1.

Appendix Table 6.4 Competitiveness indicators across firm sizes by capital, 2000, 2002 and 2005

Firm size (billion dongs)	Value-added/labour (million dongs at year 2000 prices)			Average annual growth	Value-added/wage			Average annual growth
	2000	2002	2005	(%)	2000	2002	2005	(%)
< 0.5	12.9	14.8	16.3	4.8	2.8	2.6	2.5	-2.3
0.5-1	26.7	27.5	31.9	3.6	4.5	4.2	4.9	1.8
1-4.9	41.6	47	47.8	2.8	6.1	6	5.9	-0.6
5-9.9	46.4	54.7	66.8	7.6	5.4	6	7.1	5.5
SMEs	**28.5**	**37**	**39.6**	**6.8**	**4.5**	**5**	**5**	**2.2**
10 -49	51.5	77.8	81.1	9.5	4.9	7.9	7.4	8.6
50-199	96	107	129	6.1	6.1	6	7.1	3
200-499	167	182	196	3.3	8.3	7.9	8.3	-0.1
> 500	275	484	438	9.8	10.6	26.1	16.4	9.1
LEs	**77.4**	**105**	**114**	**8.1**	**5.7**	**8**	**7.6**	**6.2**

Firm size (capital)	Value-added/capital			Average annual growth	Value-added/total cost			Average annual growth
	2000	2002	2005	(%)	2000	2002	2005	(%)
<0.5	0.51	0.53	0.72	7.1	0.25	0.25	0.3	3.7
0.5-1	0.52	0.48	0.67	5.2	0.27	0.26	0.32	3.5
1-4.9	0.48	0.44	0.46	-0.8	0.29	0.26	0.33	2.6
5-9.9	0.4	0.35	0.41	0.5	0.32	0.27	0.34	1.2
SMEs	**0.49**	**0.46**	**0.55**	2.3	**0.28**	**0.26**	**0.32**	2.7
10-49	0.32	0.31	0.36	2.4	0.32	0.27	0.34	1.2
50-199	0.29	0.3	0.36	4.4	0.33	0.29	0.36	1.8
200-499	0.28	0.29	0.36	5.2	0.36	0.29	0.37	0.5
>500	0.24	0.28	0.39	10.2	0.38	0.32	0.4	1
LEs	**0.31**	**0.31**	**0.36**	3	**0.33**	**0.28**	**0.35**	1.2

Source: As for Table 6.1.

CHAPTER 7
FIRM-LEVEL MANUFACTURING COMPETITIVENESS BY OWNERSHIP

7.1 Introduction

In Vietnam's centrally planned, closed economy prior to the beginning of economic renovation in 1986, statistical indicators on industrial activities including manufacturing were only available by industry and by the two traditional types of ownership. However, to reflect the diversification of ownership types in the market-oriented, open economy since 2000, a number of new categories and indicators have been added to the enterprise survey and statistics. These data limitations partly explain why firm-level studies about Vietnamese industry have remained limited, not only in terms of firm size and but also in terms of ownership types. This chapter sets out to use the new data to address key issues relating to competitiveness by different sectors and types of firm ownership. The use of this new data allows this analysis to be of greater depth than previously possible. These issues are as follows:

- How did the growth in key input and output indicators vary across traditional and new firm ownership types during the economic reform period in Vietnam? What patterns of structural change by ownership type occurred within manufacturing? Which sector and firm ownership types (i.e. the large publicly-owned enterprises or the newer foreign-invested enterprises (FIEs)), was the largest contributor to manufacturing growth?
- What were the features of underlying competitive advantages – fixed assets, labour skills, ICT and R&D – for different sector and firm ownership types? Were FIEs the best-equipped and most capital and technologically intensive? Which sectors and firm ownership types had the strongest or the weakest levels of competitiveness?

- To what extent did the traditional and new determinants of competitiveness impact upon the competitiveness of manufacturing firms in Vietnam?

7.2 The growth and structural contribution of different firm ownerships

7.2.1 Growth and the change of structural role of firm ownerships during 1986-2005

7.2.1.1 Classification of firm ownerships in Vietnam

In the centrally planned economy in Vietnam before the DOI MOI policy, public ownership dominated in virtually all manufacturing enterprises, in the form of state-owned enterprises and enterprises owned by collectives. The state-owned enterprises (SOEs) are categorised into central and local, and managed respectively by central and provincial governments. However, since the transition to a more market-oriented and open economy beginning in late 1986, and even more intensly since the coming to effect of the Law on Enterprises in 2000, the ownership structure of firms has become more diversified in Vietnam, as shown in the Table 7.1 below.

7.2.1.2 The changes in structural role of firm ownerships during 1886-2005

Table 7.2 and Figure 7.1 display the great structural change in the manufacturing sector by ownership during the twenty years of economic transition in Vietnam (1986-2005). The results indicate the profound changes that have taken place in the ownership of Vietnamese manufacturing. These include the shift of SOEs from being the dominant sector to the smallest, the rise of FIEs from being a non-existent sector prior to 1986 to the largest sector by 2005 and the change in the position of non-SOEs from being discriminated against to becoming engines of growth. This structural transformation occurred steadily during the reform period, but has accelerated over ten years from 1995 to 2005.

Table 7.1 Classification of enterprise ownership in Vietnam in 1986-2005

The 1986-2000 types	The post-2000 types
GSO statistical year book	GSO statistical year book
State-owned sector	**State-owned sector**
Central (central SOEs)	*Central (central SOEs)*
Local (local SOEs)	*Local (local SOEs)*
Non-state-owned sector	**Non-state-owned sector**
Collective	*Collective*
Private sector	*Private sector*
Household	*Household*
Foreign-owned sector	**Foreign-owned sector**
	GSO annual enterprise survey book
	State-owned sector
	Central state-owned (central SOEs
	Local state-owned enterprise (local SOEs)
	One-member limited central state-owned company (central SOCs)
	One-member limited local state-owned company (local SOCs)
	Non-state-owned sector
	Collective enterprise
	Private limited enterprise
	Joint stock enterprise having capital of state (joint-stock1)
	Joint stock enterprises without capital of state (joint-stock 2)
	Foreign-owned sector
	Wholly foreign-owned enterprise
	Joint venture with state-owned enterprise (joint-venture 1)
	Joint venture with private enterprise (joint-venture 2)

Source: As for Table 6.1.

Initially, the SOE sector remained dominant, contributing around 52 percent of gross output during the first ten years of reform (1985-1995) when the new forms of enterprise were just starting to operate. But over the next ten years (1995-2005), a rapid decrease in the contribution of these enterprises was witnessed, with their share of gross output falling by an average of 2 percentage points per annum. This process resulted in the SOEs share in manufacturing gross output, at current prices, shrinking to be smaller than non-SOE for the first time in the year 2004. Consequently, after twenty years of economic renovation, the share of SOEs in manufacturing gross output in Vietnam had substantially decreased by around 30 percentage points. This has fundamentally changed the role of this sector. Importantly, it should be noted that such a marked

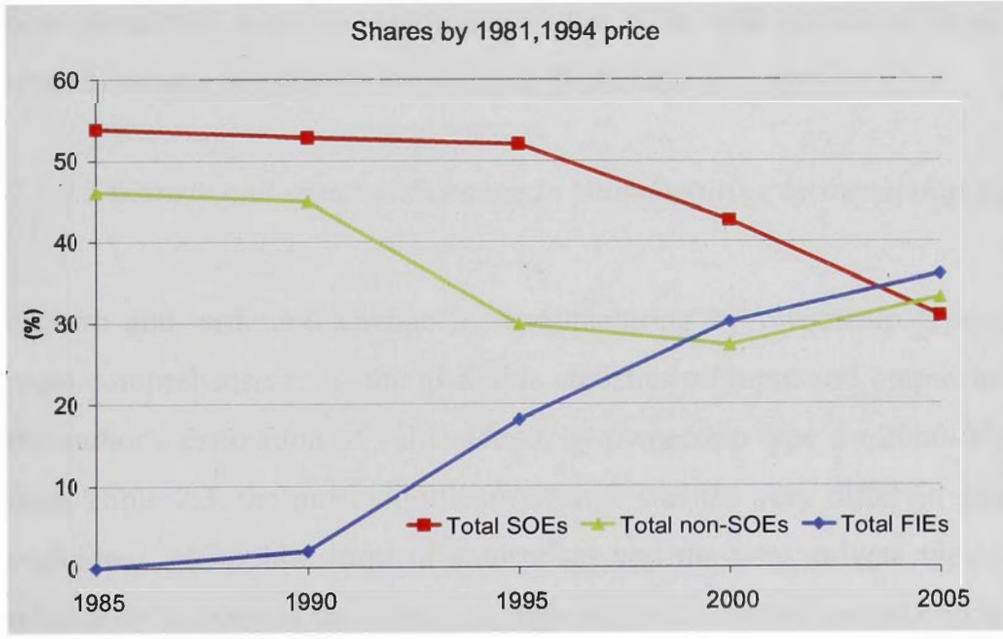
decline did not represent the stagnation of this ownership but its slower growth rate relative to that of the new firm ownership types as indicated later.

Table 7.2 Gross output shares by firm and sector ownership, 1985-2005, at 1981 and 1994 prices, (% per annum)

Firm ownership	Share by 1981 price	Share by 1994 price				
	1985	1995	2000	2003	2004	2005
Central SOEs	29.9	31.9	26.2	23.5	23.0	21.3
Local SOEs	24.0	20.2	16.5	13.5	12.2	9.6
Total SOEs	**53.9**	**52.1**	**42.7**	**37.0**	**35.1**	**30.9**
Collective		0.7	0.8	0.6	0.5	0.5
Private		7.9	12.1	17.9	20.0	22.1
Households		21.2	14.4	11.5	10.9	10.5
Total non-SOEs	**46.1**	**29.8**	**27.2**	**30.1**	**31.4**	**33.1**
Total FIEs	**0.0**	**18.1**	**30.1**	**32.9**	**33.4**	**36.0**
Total	***100***	***100***	***100***	***100***	***100***	***100***

Source: As for Table 6.1.

Figure 7.1 Changes in structure roles of different ownerships for total manufacturing gross output in Vietnam, 1985-2005



Source: Based on Table 7.2.

The share of non-SOEs in manufacturing output steadily decreased by around 16 percent, over 1985-1995. Given the unchanged share of SOEs in this period, the relative fall of non-SOE was in response to the expansion of FIEs, which started operating in Vietnam in 1988. During 1995-2000, the non-SOEs' share in gross output decreased further but at a slower pace. Nonetheless since 2000, the fast rise of private limited

enterprises has terminated this declining trend, beginning a reversal in the role of this sector in Vietnamese manufacturing. With a high rate of increase over 2000-2005, the share of non-SOEs has not only surpassed that of SOEs by 2005, but is expected to catch-up with the FIE share in the coming years.

Contrary to these trends for locally-owned firms, during 1989-1995, the share of FIEs rose rapidly with the current price share increasing by an average of three percentage points per annum and expanding even more rapidly over 1995-2000 to reach 27.2 percent by 2000 at constant 1994 prices and even about 14 percent higher at current prices (see Table 7.4). As a result, FIEs replaced SOEs as the largest sector of manufacturing in Vietnam in terms of gross output in 2000 in constant prices and even earlier in current prices. When measured at current prices the FIE proportion rose at a slower pace between 2000 and 2005, and even declined slightly in 2005 (although it increased strongly in constant prices in that year). This slowing rate of increase in the FIE share of gross output undoubtedly reflects in part the rapid rise of non-SOEs during this period. But the critical contribution of FIEs in the years since this ownership type was permitted provides evidence of the wide and profound impact of economic renovation and the open-door policy in Vietnam.

7.1.2.3 Growth and structural change in manufacturing by ownership type over 2000-05

Growth and structural change in manufacturing by ownership type can be analysed more comprehensively using available statistics on input and output indices, as well as the author's estimation of value added, by ownership type for 2000-05. As can be seen from Table 7.3, the most significant change was the very different growth rates of the traditional, old public form of enterprises and the new, private type of enterprises in relation to number of the firms, employment and all other indicators shown in the table. The former experienced much lower growth rates, in particular the local SOEs which suffered a sharp reduction in number of firms and in employment for the first time since the establishment of the socialist regime and of public-owned ownership of production factors in North Vietnam from the late 1950s and in South of Vietnam by the late 1970s. This was directly brought about by the government strategy to reform the SOEs, which aimed at raising the efficiency of public-owned firms via a range of different methods,

including merger and equitization (a form of partial privatisation, involving bringing in private capital, sale, lease) or simply closing down loss-making enterprises. Similarly, the number of collective enterprises showed virtually no growth between 2000 and 2005, and this ownership type also showed low growth rates on most other variables.

Table 7.3 Average annual growth rates of enterprises by ownership (% per annum), 2000-2005

Firm ownership	Number (%)	Labour (%)	Capital (%)	Gross output (%)	Value-added (%)	Tax payment (%)
Central SOEs	-1	1.5	17.4	11.1	10	10.4
Local SOEs	-13.6	-7.8	1.8	2.93	5	5.6
SOEs	**-8**	**-2.5**	**12.9**	**8.29**	**8.3**	**8.8**
Collective	0.2	0.7	9.2	6.1	5.3	-2.2
Private	9.5	15.1	26.2	15.4	22.6	20.6
Private limited	32.9	18	32.9	29.3	30.4	26.2
Joint stock 1	62.9	27.4	46.8	72.1	46.7	69.4
Joint stock 2	21.7	47.3	53.2	44.4	71.9	53.7
Non-SOEs	**19.8**	**19.5**	**34.7**	**29.9**	**32.8**	**32.6**
Wholly FIEs	25.5	29.1	22.1	26.9	29.5	27
Joint venture 1	-2.8	2.6	0.8	12.2	10.9	25.8
Joint venture 2	19.6	32.4	19.9	21	22.3	25.9
FIEs	**20**	**25.7**	**14**	**21**	**21.9**	**26.9**
Total	***17.2***	***14.1***	**17.5**	***19***	***19.9***	***18.9***

Source: As for Table 6.1.

In contrast, all new types of ownership enjoyed very high growth in firm numbers, employment and capital used, except joint-ventures with SOEs. The fastest growth rate for many variables was in both joint-stock enterprises with or without state-owned capital. This is partly explained by their very low starting level, as indicated in Appendix Table 7.1. For joint-stock enterprises with state-owned capital (most of which resulted from SOEs' privatisation) such a high growth rate is partly caused by their new ownership form inducing higher business efficiency. Beyond joint-stock, private limited firms emerged as the most rapidly expanding across all firm ownerships with regard to the number of firms, employment and value-added. This ownership type was followed by wholly FIEs in terms of growth rates of these variables.

Foreign joint-ventures with SOEs was the only non-traditional firm ownership that had an absolute reduction in the number of firms over the period, together with the lowest growth rates among the new ownership types on other variables, especially in job creation. This is a result of foreign firms switching away from joint-ventures with SOEs

to wholly foreign owned FIEs. This phenomenon can in turn be explained by a tendency among foreign firms to seek more independent business decisions and a less complicated firm organization structure, especially after accumulating sufficient knowledge of the local market and the legal system via a previous joint-venture. Foreign joint-ventures with non-SOEs partners have experienced rapid growth in terms of firm number, largely as a result of the impact of the Law of Enterprises (which will be analysed further below).

Opposing trends in growth rates for activity variables and tax rates are also of interest. While for most ownership types, the growth in tax payments is broadly in line with or a little below, the growth in value-added; for two types which involve joint ventures with state capital the growth in tax payments is well ahead of growth in value-added. While this might reflect different trends in profitability, it is likely to be largely due to the fact that joint-ventures with state capital, including with SOEs, were an earlier organization innovation, pre-dating by about ten years the later surging in forms such as private limited liability enterprises. As a result most of the former had completed the tax-exemption or reduction period of between 2-10 years, while the latter were still able to access these tax benefits.

Table 7.4 provides data on the distribution of the total value of each of six indicators by firm ownership type. Two notes should be made to this table as compared to Table 7.2. First, the financial variables are in current prices. Second, the figures merely cover registered firms, not households with manufacturing activities, thereby for all variables the shares of the non-SOEs sector are those in total manufacturing firms, or in the total manufacturing sector excluding the part of households. As a result the output proportion of this sector is somewhat lower, by about 3 percent, than those in Table 7.2.

On the one side of the growth spectrum, with a very high growth rate of firm numbers, private limited liability enterprises doubled their share of all firms, rising to almost one half (43.7 percent) of the total number of firms. The share of joint stock enterprises with state-owned capital in the total number of firms also rose steeply, jumping to over five times its 2000 share by 2005. On the other side, the firm share of joint-ventures with SOEs was very small in 2000 at 2.6 percent, but was still reduced by more than one half.

It is notable that of all firm ownership types and for all indicators, the sharpest structural change occurred for SOEs' employment share, which decreased from 43.0 percent to 19.6 percent within the five years of 2000-2005, turning SOEs from the greatest manufacturing employer among the three major ownership types to the smallest. This reduction occurred for both central and local SOEs but the employment share fell more heavily for the latter, whose share fell by 13.3 percentage points or by two-thirds in only five years. By contrast, non-SOEs replaced SOEs as the biggest employment sector, accounting for 42.8 percent of the total by 2005. Wholly foreign-owned FIEs doubled their share of total jobs over this period, with their share rising to 33.1 percent, making them the largest manufacturing employer of all ten firm ownership types in Vietnam by 2005. The exchanged roles of SOEs and FIEs for employment can be largely explained by the SOE reform program noted earlier and the massive expansion of FIEs in labour-intensive, export-oriented industries.

Capital was the only input by which SOEs still demonstrated a slightly greater level than non-SOEs whereas the latter doubled its share to 27 percent and FIEs remained as the largest sector from 2000. Across firm ownerships, central SOEs still remained as the second largest, with 21.8 percent in total despite its somewhat decline. The non-SOEs sector as a whole and the private limited sector doubled their capital share twice. Within FIEs, representing 30 percent of total capital, the wholly FIEs became the largest of all firm ownership types from 2000, but joint-venture with SOEs experienced the biggest reduction of up to 13.2 percent, and joint-venture with non-SOEs remained the second smallest with a very small capital share of 1.86 percent.

With respect to output indicators, it can be noted that gross output and value-added had similar distributions. FIEs was the greatest sector assessed by capital input, being responsible for up to 45 percent of total value-added by 2005 and central SOEs relinquished their long-held role in largest output of all firm ownership types to the wholly FIEs in 2005. Alternatively, private limited forms increased their output share by a smaller degree than in other indicators, but still replaced joint-venture with SOEs as the third largest type, nearly catching up with the level of the traditionally large central SOEs. Also, while wholly FIEs, the largest of all firm ownerships from 2005,

contributed 30 percent of total value-added, joint-venture with SOEs experienced a declining share of 6.5 percent.

Table 7.4 Contribution of enterprises by ownership (%), 2000 and 2005 (financial variables at current prices)

Firm ownership	Number of firms		Capital		Employment	
	2000	2005	2000	2005	2000	2005
Central SOEs	5.4	2.3	21.9	21.8	22.7	12.6
Local SOEs	9.0	2.0	11.6	5.6	20.3	7.0
Total SOEs	**14.4**	**4.3**	**33.4**	**27.4**	**43.0**	**19.6**
Collective	10.0	4.6	0.5	0.4	2.8	1.5
Private	39.8	28.3	2.2	3.2	6.5	6.7
Private limited	23.2	43.7	8.8	16.2	20.6	24.4
Joint stock 1	1.2	6.2	1.5	4.4	2.4	4.2
Joint stock 2	1.2	1.4	0.8	3.1	1.7	6.1
Total non-SOEs	**75.5**	**84.3**	**13.7**	**27.2**	**34.0**	**42.8**
Wholly FIEs	6.8	9.5	26.7	32.4	17.8	33.1
Joint venture 1	2.6	1.0	24.6	11.4	4.5	2.6
Joint venture 2	0.8	0.8	1.5	1.7	0.9	1.9
Total FIEs	**10.1**	**11.4**	**52.8**	**45.4**	**23.2**	**37.6**
Total	***100***	***100***	***100***	***100***	***100***	***100***
	Output		**Value-added**		**Tax revenue**	
	2000	2005	2000	2005	2000	2005
Central SOEs	23.3	17.6	25.8	18.8	35.0	24.2
Local SOEs	14.5	6.7	14.1	7.1	19.8	10.9
Total SOEs	**37.8**	**24.3**	**40.0**	**26.0**	**54.8**	**35.1**
Collective	0.8	0.4	0.9	0.4	0.4	0.1
Private	5.7	4.7	3.9	4.1	1.7	1.8
Private limited	11.7	16.9	11.1	15.6	7.5	10.0
Joint stock 1	0.7	4.8	0.7	4.3	0.4	2.5
Joint stock 2	1.9	4.0	1.7	3.7	1.4	5.0
Total non-SOEs	**20.8**	**30.8**	**18.2**	**28.1**	**11.3**	**19.4**
Wholly FIEs	21.8	28.7	20.6	29.5	11.2	15.5
Joint venture 1	18.3	14.3	19.5	14.5	21.8	28.8
Joint venture 2	1.9	1.9	1.8	1.9	1.0	1.3
Total FIEs	**42.0**	**44.9**	**41.8**	**45.9**	**32.9**	**45.5**
Total	***100***	***100***	***100***	***100***	***100***	***100***

Source: As for Table 6.1.

Lastly, in relation to tax revenue, SOEs contribution fell significantly, from 54.8 percent in 2000 to 35.1 percent within just five years. However, this sector still was the second greatest because other firm types indicated slower tax revenue growth. The non-SOEs

role for budget revenue was markedly asymmetric to those of other indictors with their tax revenue share being nearly 10 percent lower than in output and value-added. But with a increase in tax payment by 13 percent, FIEs replaced SOEs as the largest tax contributor. It should be emphasized that such an important role of FIEs was attributed to only joint-venture with SOEs, whereas this firm ownership type experienced significant decline in all other indices analysed. Wholly foreign-owned enterprises contributed a tax revenue proportion of merely half that of value-added. Both central SOEs and local SOEs contributions dropped by around 10 percent, while that of joint-ventures rose by 7 percent, thereby taking over the role from the most important to the second for the former and vice versa.

The decrease in tax revenue contribution of SOEs obviously was caused by its previous declines in all input and output. Nevertheless the reasons for opposite trends in the FIEs sector most probably should be found in different periods of tax exemption and reduction between joint-venture with SOEs and wholly FIEs. Since most of the latter were newly established, they accordingly still enjoyed the investment incentive – mostly in the form of tax exemption or reduction between two and eight years.

In short, since the introduction of economic renovation in Vietnam, in particular during recent ten years of 1995-2005, the most important structural roles had correspondingly been transferred from SOEs to FIEs with respect to capital, value-added, tax revenue and to local non-SOEs with respect to employment. Likewise, central SOEs changed from the largest and most important contributor to second place; it was replaced by wholly FIEs, based on virtually all indices of input and output.

7.2.2 The structural roles of firms by ownerships combining sizes

The major characteristics of the cross-ownership structure role within each sector size can be identified, based on Table 7.5. First, SOEs are characterized by their large size with two-thirds of the number being central and more than half of the local being large-sized firms. These were also the highest shares in number of LEs across all ownerships. The proportion of LEs in total employment, capital, and value-added within both central and local SOEs pointed even higher in number, around between 15 and 20 percent higher than the average level in total enterprises (94, 83.1 and 92.5 compared to 72.7,

77.3 and 77.9). This larger average size of SOEs reflected the result of restructuring SOEs, many of whom were merged into larger enterprises.

Table 7.5 Shares of each ownership combining sector size in each type of ownership' number, employment, capital and value-added, (%) 2005

Firm types	Firm number		Employment		Capital		Value-added	
	SMEs	LEs	SMEs	LEs	SMEs	LEs	SMEs	LEs
Central SOEs	30.6	69.4	4.8	95.2	18.2	81.8	6.9	93.1
Local SOEs	44.7	55.3	8.1	91.9	11.5	88.5	8.7	91.3
Total SOEs	**37.0**	**63.0**	**6.0**	**94.0**	**16.9**	**83.1**	**7.5**	**92.5**
Collective	95.6	4.4	61.0	39.0	72.5	27.5	70.1	29.9
Private	97.8	2.2	64.8	35.2	67.1	32.9	67.0	33.0
Private limited	92:3	7.7	40.9	59.1	50.9	49.1	47.1	52.9
Joint stock 1	78.7	21.3	30.0	70.0	42.3	57.7	34.0	66.0
Joint stock 2	51.8	48.2	13.1	86.9	17.6	82.4	15.3	84.7
Total non-SOEs	**92.6**	**7.4**	**41.1**	**58.9**	**47.9**	**52.1**	**44.1**	**55.9**
Wholly FIEs	61.4	38.6	9.8	90.2	21.7	78.3	16.5	83.5
Joint venture 1	53.9	46.1	13.4	86.6	17.8	82.2	15.0	85.0
Joint venture 2	67.5	32.5	15.0	85.0	35.3	64.7	26.5	73.5
Total FIEs	**61.2**	**38.8**	**10.3**	**89.7**	**21.2**	**78.8**	**16.5**	**83.5**
Total	***86.7***	***13.3***	***22.6***	***75.8***	***27.3***	***72.7***	***22.7***	***77.3***

Source: As for Table 6.1.

Secondly, in contrast, the majority of firm ownerships belonged to non-SOEs, except joint-stock enterprises having state-owned capital, which were of small and medium size. Particularly, collective, private and private limited enterprises were the highest proportion of SME firms, up to 97.8 percent, 95.6 percent and 95.2 percent respectively, by 2005. This feature mainly resulted from restraints in capital mobilization and scale expansion of non-SOEs as the new ownership. The small size of non-SOEs explained why this sector ownership accounted for the dominant rate in total firm numbers but still played the smaller role in total capital, value-added and tax revenue as compared to other sectors. Within non-SOEs, only joint-stock enterprises having state-owned capital consisted of nearly a half of total enterprises being LEs, the highest ratio of LEs of all non-SOEs firm. The large size of this ownership was attributed to their establishment history as a result of equalizing large SOEs and continuously expanding their scale through the issuing of bonds.

Table 7.6 Shares of major firm ownerships combining major firm sizes in total manufacturing input and output, 2005

Firm types & sizes	Employment		Capital		Gross output		Value-added	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Central SOEs & selected sizes	**63.40**	**13.90**	**63.70**	**7.99**	**66.20**	**10.80**	**67.30**	**11.30**
1000-4999	34.90	7.00	32.10	4.40	37.70	6.15	38.60	6.50
500-999	12.10	4.10	18.80	1.53	12.40	2.03	12.80	2.15
≥5000	9.98	1.37	6.32	1.26	8.21	1.34	8.14	1.37
300-499	6.34	1.39	6.41	0.80	7.91	1.29	7.73	1.30
Private limited &	**73.50**	**12.10**	**74.80**	**17.90**	**73.80**	**12.90**	**73.90**	**12.50**
50-199	24.50	4.87	30.10	5.98	29.20	5.10	27.50	4.65
200-499	14.00	2.77	17.10	3.42	17.50	3.05	16.90	2.86
500-999	15.30	1.82	13.20	4.26	13.20	1.99	14.70	2.09
1000-4999	17.50	2.14	11.30	3.73	11.40	2.29	12.40	2.48
≥5000	2.06	0.50	3.10	0.50	2.42	0.42	2.41	0.41
Wholly FIEs &	**76.50**	**18.90**	**58.30**	**25.30**	**65.00**	**19.20**	**67.40**	**20.40**
1000-4999	34.60	10.10	31.10	11.40	35.10	10.40	34.70	10.50
500-999	15.80	5.48	16.90	5.22	17.90	5.28	18.50	5.59
≥5000	26.10	3.33	10.30	8.64	12.00	3.53	14.20	4.29
Joint-venture &	**76.40**	**8.06**	**70.60**	**2.01**	**68.40**	**9.22**	**71.60**	**9.45**
500-999	26.30	4.02	35.20	0.69	30.40	4.10	32.00	4.23
1000-4999	35.40	2.08	18.20	0.93	23.70	3.19	23.90	3.16
300-499	14.70	1.96	17.20	0.39	14.30	1.93	15.60	2.06
Total above firm types		**52.90**		**53.20**		**52.10**		**53.70**

Source: As for Table 6.1. Note: (1); share in the relevant sector ownership's total employment, capital, gross output and value-added. (2): share in the total manufacturing sector's employment, capital, gross output and value-added.

Looking to FIEs, in contrast to normal thinking on their potential of capital and relevant firm size, this sector ownership constituted a relatively high SMEs fraction in total number, nearly doubled that of SOEs. But the shares of SMEs in total FIEs input and output were still significantly lower than those in non-SOEs.

Analysing the structural role of the firm combining nine firm sizes with ten firm ownerships, we define 90 types of firms. Of these firms, it is evident from Table 7.6 that wholly FIEs with the second largest size (employing 1000-4999 workers) was identified as the largest, with a contribution of above 10 percent to total enterprises' employment, capital, gross output and value-added. Such a role for this firm type is an inevitable combination of wholly FIEs' largest role across ownerships types and its second-largest portion in terms of firm size, as indicated in previous sections. The second most

important firm type was the central SOEs (also with 1000-4999 employees) size by all indicators, except employment. The next in order was the private-limited firm, reflecting the importance and properties of both size and ownership. Joint-ventures with SOEs employing 500-999 workers came as the fourth, using both size and ownership classifications.

7.3 Characteristics of underlying production factors of firms in different ownership categories

7.3.1 Capital, labour skill, information and communication technology (ICT)

Table 7.7 displays intensity levels of capital, skill and ICT as supply-side competitive advantages of different sector firm ownerships in Vietnam, over the period 2000-2005. A number of underlying characteristics can be seen.

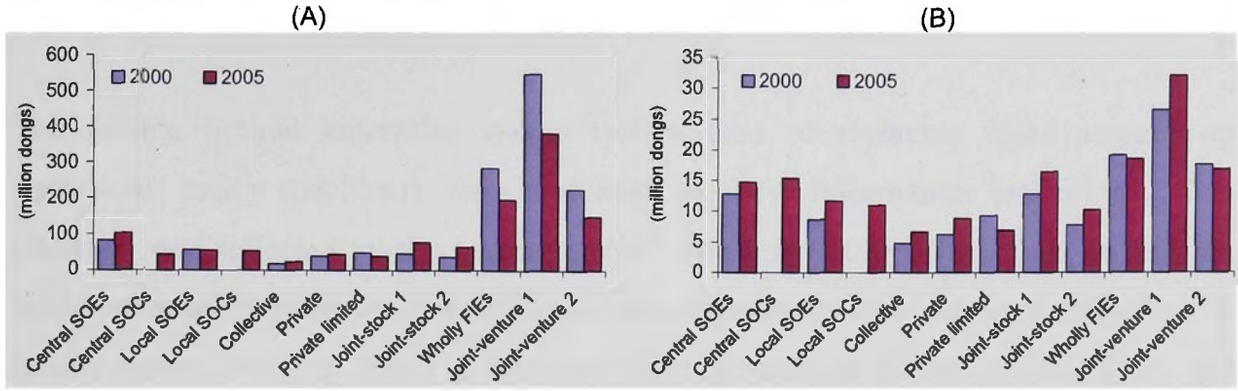
Firstly, over the five years of 2000-2005, the equipment gap had been considerably narrowed since virtually all Vietnamese-owned firms, especially capital-employee ratios of central SOEs and joint-stock with SOEs increased above 20 percent per annum while that of all foreign firms reduced. As a result, that ratio of wholly-foreign firms reduced from being 400 percent higher than central SOEs in 2000, to merely around 12 percent by 2005. In particular, joint-venture with non-SOEs turned from nearly three times richer than central SOEs to the poorer over these five years. Within capital-intensive industry like transport equipments excluded automobile (ISCI 35), the capital convergence between private limited and FIEs took placed rather rapidly as capital equipment per employee of private limited increased from 5 percent of joint-venture to close 25 percent after only five years.

Table 7.7 Characteristics of supply-side factors of firm by ownership, 2000-2005

Firm ownership	Mean (standard deviation)								Number of observations	
	Fixed asset employee (million dongs)		Wage/employee (million dongs)		PC-lan employee		PC-internet employee			
	2000	2005	2000	2005	2002	2005	2002	2005		
Central SOEs	82.9	176	12.8	20	17.5	38.6	9.98	26.3	522	326
	(250)	(535)	(8.67)	(15.7)	(48.6)	(97.1)	(35.5)	(74.6)		
Central SOCs		107		16		38.3		29.8	945	291
		(315)		(11.7)		(95.4)		(79.9)		
Local SOEs	57.2	101	8.66	20.6	10.6	32.2	7.01	19.9		35
	(148)	(119)	(6.46)	(9.66)	(32.3)	(30.9)	(27.5)	(27.9)		
Local SOCs		80.7		14.9		36.4		16.3		45
		(99.3)		(8.23)		(63.8)		(44.2)		
SOEs	**65.4**	**124**	**10.1**	**17.7**	**13.2**	**37.9**	**8.37**	**26.2**	**1467**	**975**
	(187)	**(368)**	**(7.54)**	**(12.9)**	**(40)**	**(85.9)**	**(1596)**	**(70.1)**		
Collective	18.5	25.9	4.84	6.71	0.75	1.88	1.51	4.07	1007	1045
	(29)	(41.3)	(3.89)	(5.56)	(8.43)	(16.8)	(7.39)	(19.9)		
Private	40.3	50.3	6.25	8.65	2	4.67	5.88	10.4	4009	6362
	(56.9)	(127)	(7.94)	(8.83)	(24.3)	(38.4)	(28.1)	(44.1)		
Private limited	48.7	63.3	9.3	10.6	16.1	30.9	20	37.2	2418	9848
	(97.3)	(179)	(8.22)	(9.18)	(71.9)	(117)	(48.6)	(110)		
Joint-stock 1	48.1	66.4	12.8	16.3	17	34.5	6.93	26.6	126	328
	(118)	(97.5)	(9.51)	(11)	(30)	(63.6)	(11.4)	(56.4)		
Joint-stock 2	38.1	84	7.66	10.3	25.3	37.8	17.6	33.6	127	1391
	(67.6)	(432)	(5.41)	(10)	(85.2)	(104)	(47.1)	(88.4)		
Non-SOEs	**39.9**	**58.4**	**6.78**	**9.78**	**9.31**	**20.4**	**12.3**	**26**	**5295**	**17243**
	(70.9)	**(191)**	**(7.72)**	**(9.12)**	**(54.3)**	**(78.8)**	**(453)**	**(74.9)**		
Wholly FIEs	285	236	19.2	15.9	43.4	75.9	38	73.4	694	2130
	(605)	(584)	(705)	(37.6)	(97.7)	(126)	(90.7)	(122)		
Joint-venture 1	548	454	26.5	22	107	144	60.1	111	279	226
	(706)	(944)	(1140)	(15.4)	(172)	(177)	(110)	(149)		
Joint-venture 2	226	149	17.6	16.8	19.8	65.2	30.7	66.2	76	186
	(447)	(263)	(11.7)	(10.8)	(59.9)	(105)	(47.1)	(100)		
FIEs	**350**	**209**	**21**	**19.5**	**54.2**	**80.6**	**42.9**	**75.6**	**1049**	**2542**
	(837)	**(502)**	**(38.4)**	**(19.6)**	**(121)**	**(134)**	**(101)**	**(123)**		
Total	***76***	***79.4***	***8.72***	***11.3***	***15***	***1732***	***48.3***	***32.3***	***10090***	***20804***
	(298)	***(246)***	***(14.9)***	***(11)***	***(68)***	***(2033)***	***(155)***	***(3187)***		

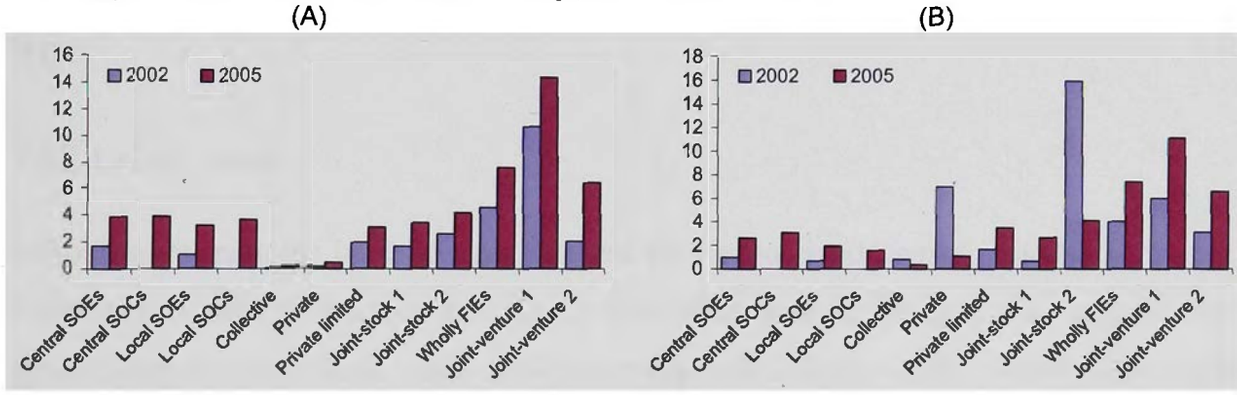
Source: As for Table 6.1.

Figure 7.2 Fixed capital (A), wage per employee (B), across firm ownerships, 2000 and 2005



Source: Table 7.7.

Figure 7.3 PC connected land (A) and PC connected internet (B) per 1000 employees, across firm ownership, 2000 and 2005



Source: Table 7.7.

Likewise, a contrasting distribution of information and communication technology (ICT) as a typically new competitive advantage, marked a distinction between foreign competitors and the domestic enterprises. Except for the number of PCs connected to the internet in 2000, the most-equipped was joint-venture with SOEs, followed by two other types of FIEs. Central SOEs stood as the medium IT-intensive and the non-SOEs and collective came in as the lowest sector.

Nevertheless, IT intensity patterns differed from the fixed capital by two main features. First, non-SOEs sectors were more intensive in terms of using the internet than SOEs and joint-stock without state-owned capital and private limited showed the highest ratio of PCs connected to the internet to employees of all locally-owned firms. This suggests that, non-SOEs actively utilized ICT as new technology to overcome their other disadvantages which came from a small business scale. Second, the ICT intensity divergence between FIEs and SOEs slightly reduced after five years (2000-05), but did

so to a lesser degree than in capital disparity. Such slower IT catching-up occurred since both PC-using indicators of FIEs rapidly increased, while the capital-using absolutely lowered.

The private limited enterprise was a typical case of replacing disadvantages on traditional, heavy machinery and equipment by new information technology. This tendency was reflected by the two highest PC applying ratios of this firm ownership, land connected PC/employee by 2000 and internet connected PC/employee of across all locally-owned firms by 2005. In this year, the highest ratio of land-connected PC per 1000 employees was achieved by central SOEs, but was still nearly 50 percent lower than internet-connected PCs. In particular, the local state-owned companies (SOCs) displayed as the lowest in relation to both IT application indicators of all analysed firm types.

7.3.2 Labour wage

Labour wage patterns have several features similar to fixed capital. Firstly, FIEs and joint-venture with SOEs had the highest rate while non-SOEs, collective and private limited had the least. Such wage distribution suggested that by 2005, joint-venture with SOEs still employed more skilful, better-trained employees and therefore possessed competitive advantages in not only machinery and equipment as analysed above, but also better human capital. Secondly, wage per employee increased markedly for SOEs while that in both joint-venture with SOEs and wholly FIEs declined about one third, leading the former, as compared to wholly FIEs, from paying around half the wage rate to becoming the better-paid type by the end of 2005. Thirdly, of the locally-owned firms, both central SOEs and central SOCs, traditional and new firm ownership respectively, demonstrated as the strongest growth. In contrast, non-SOEs, the largest employer presented as both the lowest and slowest growth in relation to average wage payment to employee with private limited being the typical ownership.

The low wage rates paid by the non-SOE sectors, implied partly that this sector still could not attract a well-trained and highly-skilled labour force, especially for workers being initially employed between 2000-05. This phenomenon, together the sharply declined wage rate in FIEs as the second largest employer, however partly reflected the

context of labour market in Vietnam in which the wage increased slowly since labour supply rose faster than labour demand owing to a relatively large and fast growing population. This justified why the average ratio of wage per employee of the whole manufacturing sector in Vietnam increased slowly during the five years of 2000-05.

7.3.3 R&D personnel and activities

Table 7.8 demonstrates the R&D pattern of different firm ownerships, measured by two indicators, ratio of number of R&D staff to total employee and composition of R&D personnel by qualification levels among firm types. As compared to patterns of traditional production factors, R&D was more complicated. First, the ratios of R&D personnel in total employee in all firm types were not only small but even steadily fell, reflecting partly that the increase in the number of firms was not proportional to their R&D capacity. In other words, more newly established firms did not have R&D activities at all. Second, among firm ownerships, central SOEs and joint-venture with SOEs had the highest ratio of R&D personnel over total employees, while collective and private enterprises and FIEs with non-SOEs had almost no researchers. It should be noted that, in contrast to wholly FIEs substantial advantage on fixed asset as compared to locally-owned firms, wholly FIEs markedly showed markedly lower and even equaled to one-fourth and a half that of central SOEs.

The intensity level of R&D personnel in firms additionally could be further assessed by their structure of qualifications categorised in to four levels, namely associate diploma, bachelor, master and doctor of philosophy (PhD). Two notable features can be seen. Firstly, as to firm size categories, whereas more staff with a diploma degree or bachelor-degree had been slightly replaced by those with post-graduate qualifications, bachelor holders remained as the majority in all ownership categories, constituting around three-quarters of total R&D personnel. The share of master and PhD degree holders remained only very small in all firm types. Secondly, the largest proportion of bachelor, master and PhD degrees recorded correspondingly in all SOE, non-SOE and FIE sectors whereas the master proportion tended to rise in non-SOEs.

Table 7.8 R&D personnel and qualification structure of different sector and major firm ownerships (%), 2000 and 2002

Firm ownership	R&D personnel/ employee		Assoc. diploma share		Bachelor share		Master share		PhD share	
	2000	2002	2000	2002	2000	2002	2000	2002	2000	2002
Central SOEs	2.45	2.12	9.89	7.00	91.10	88.80	0.75	1.21	0.56	0.51
Local SOEs	1.09	1.08	14.20	17.30	81.90	85.00	0.52	0.71	0.28	0.03
SOEs	**1.55**	**1.46**	**12.00**	**11.40**	**87.00**	**87.00**	**0.63**	**1.19**	**0.42**	**0.29**
Collective	0.00	0.00								
Private	0.00	0.00								
Private limited	0.58	0.74	14.20	15.20	78.10	83.20	1.41	3.32	1.21	1.81
Joint-stock 1	1.51	1.07	7.47	6.48	92.70	91.30	1.16	0.51	0.10	0.33
Private limited	0.58	0.74	14.20	15.20	78.10	83.20	1.41	3.32	1.21	1.81
Joint-stock 1	1.51	1.07	7.47	6.48	92.70	91.30	1.16	0.51	0.10	0.33
Non-SOEs	**0.55**	**0.68**	**13.90**	**15.20**	**84.10**	**79.60**	**1.18**	**2.72**	**0.86**	**1.26**
Wholly FIEs	0.84	0.41	14.90	13.90	83.80	82.60	2.35	1.70	0.10	0.61
Joint-venture 1	3.19	2.07	7.42	7.12	87.60	91.30	0.83	3.23	0.47	1.92
Joint-venture2	0.00	0.00								
FIEs	**1.57**	**0.77**	**10.80**	**10.20**	**86.60**	**85.10**	**2.00**	**1.92**	**0.60**	**2.26**
Total	***0.99***	***0.81***	***12.20***	***12.60***	***83.90***	***86.20***	***1.04***	***1.88***	***0.57***	***0.97***

Source: As for Table 6.1.

Table 7.9 demonstrates the alternative figures for evaluating cross-ownership R&D intensity levels, and ratios of R&D expenditure over sales. The first distinct characteristic was that SOEs' percentage of firms undertaking R&D activities was a lot higher than that of non-SOEs and FIEs, 18 compared to 3.21 and 4.24 percent. But the proportion of R&D spending to total sales fell in the SOE sector, while that in non-SOEs and FIEs increased by around threefold between 2000 and 2002. As result, whereas SOEs still remained as the most R&D intensive sector, its average R&D spending to sales ratio was only slightly higher than that of FIEs in 2002.

SOEs' reduction in R&D intensity was a result of the significant declines of these activities in both central SOEs and local SOEs. This consequently changed SOEs from being the second most R&D intensive to the second least of all major firm ownerships and local SOEs shifted from the most intensive to the second intensive by the year 2002. Raising most rapidly was the ratio of expenditure over total sales, by nearly sixfold, joint-venture with SOEs R&D intensity levels still nearly doubled that of wholly FIEs after only two years.

With regard to the proportion of firms conducting R&D, central SOEs again was the largest, followed by joint-venture with SOEs and local SOEs while wholly FIEs showed as the least. It should be noted that, while the differential between SOEs firm ownerships was not considerable, between firm ownerships belonging to the non-SOEs or FIEs sector were very large and even increased over the period. The gaps existing between private limited and joint-stock having state-owned capital and between wholly FIEs and joint-venture with SOEs was fivefold and ninefold respectively.

In respect to sources of R&D funding, the major source for all firm ownerships came from their own funds. But SOEs and other related SOEs, namely central, local and joint-stock with state-owned capital, still relied considerably on the State budget, which accounted for 20 percent of total R&D sources for the two former and 10 percent for the latter by 2000. The source from State even tended to be higher for central SOEs by 2002. In contrast, private limited received very low funding from the State, accounting for only 2 percent of its total R&D expenditure and foreign firms obviously had no funds from the host country government. That is why these firms mostly sought non-state funding such as self-raised and other external resources most of which were bank loans. Borrowing patterns tended to expand with an increased proportion of R&D funds coming from domestic sources. Joint-ventures, in particular, raised R&D bank loan funding from zero to nearly 10 percent of total R&D spending within merely two years, thereby increased significantly this sector's R&D intensity by all indicators.

Looking into R&D destinations (see Table 7.9), SOEs indicated as the only sector spending the majority of its funding on direct R&D or technology innovation while non-SOEs and FIEs had approximate more than one-third of their R&D expenditure on indirect activities or technology acquisition. The central SOE sector was the most innovative in 2000 and the second, behind joint-stock being state-owned in 2002. It should be noted, joint-venture with SOEs came as the third in 2000 but this place was replaced by local SOEs in 2002 since the former's funding share on direct R&D fell from 37 percent to 23 percent in only two years.

Table 7.9 R&D funding sources and destinations across ownerships (%), 2000 and 2002

Firm ownership	State		Self-raised		Foreign		Loan	
	2000	2002	2000	2002	2000	2002	2000	2002
Central SOEs	21.40	34.60	61.70	47.60	1.85	0.00	15.10	17.80
Local SOEs	17.90	25.40	50.10	56.70	0.00	0.00	32.00	17.80
SOEs	**19.20**	**28.80**	**55.70**	**53.50**	**0.80**	**0.00**	**24.30**	**17.80**
Private limited	2.44	2.25	82.60	83.30	0.54	0.00	14.50	14.50
Joint-stock 1	11.00	23.80	60.90	65.60	0.00	0.00	28.10	10.60
Non-SOEs	**3.25**	**6.52**	**79.00**	**75.50**	**0.24**	**0.29**	**17.50**	**17.70**
Wholly FIEs	0.00	0.00	78.90	75.60	21.10	6.19	0.00	18.20
Jont-venture 1	0.00	0.00	93.80	70.30	6.25	0.00	0.00	29.70
FIEs	**0.00**	**0.00**	**84.20**	**72.40**	**15.80**	**3.63**	**0.00**	**24.00**
Total	***12.80***	***15.20***	***65.10***	***65.40***	***2.13***	***0.68***	***20.00***	***18.70***

Firm ownership	Firms had R&D/total		R&D/total sales		Direct R&D/total		Indirect R&D/total	
	2000	2002	2000	2002	2000	2002	2000	2002
Central SOEs	20.60	18.40	0.75	0.57	46.40	47.80	53.60	52.20
Local SOEs	14.60	16.50	1.69	1.29	33.00	38.20	67.00	61.80
SOEs	**16.60**	**17.00**	**1.32**	**1.03**	**41.50**	**44.00**	**58.50**	**56.00**
Collective	0.00	0.00	0.00	0.00				
Private	0.00	0.00	0.00	0.00				
Private limited	2.59	3.01	0.67	1.01	27.50	22.50	72.50	77.50
Joint-stock 1	10.00	15.00	0.22	0.38	40.00	52.40	60.00	47.60
Non-SOEs	**3.31**	**3.21**	**0.30**	**0.85**	**31.00**	**28.50**	**67.00**	**71.50**
Wholly FIEs	2.97	2.12	0.46	0.79	27.20	24.80	72.80	75.20
Joint-venture 1	5.95	16.80	0.35	1.82	37.00	23.00	63.00	77.00
Joint-venture 2	0.00	0.00	0.00	0.00				
FIEs	**3.94**	**4.74**	**0.30**	**0.97**	**33.00**	**23.50**	**67.00**	**76.50**
Total	***8.44***	***7.00***	***0.44***	***0.44***	***35.90***	***33.50***	***64.10***	***66.50***

Source: As for Table 6.1.

All findings from both measures on R&D activities across ownerships indicated that SOEs and joint-venture with SOEs engaged more direct research activities and technology innovation. But wholly FIEs and all ownerships in non-SOEs focused more on technology acquisition and exploited equipments and machinery. SOEs-relating enterprises' behaviours were considerably justified by the State involvement in both supply and demand sides, financial, personnel supports and strategic planning requirements in order to strengthening national R&D capacity. While the wholly FIEs' decision was explained by their global value-added strategy in general and R&D in

particular according to which R&D in low or middle-low income developing countries was limited in serving to adapt technology to meet local market features.

For non-SOEs, the reason should be found in their limited capital and human resources and typical short-term profit motivation that restrained risky, costly research, which most probably would be beneficial in the long term. But the contrasting ratios between the lower number of private limited involved in R&D in total and their average higher R&D expenditure on total sales as compared to SOEs, primarily suggested these firm ownership spending on R&D was more concentrated, realistic and efficient than the traditional average and formal pattern of R&D in SOEs. The identified R&D characteristics of firms with different ownerships in Vietnam showed that SOEs of locally-owned firms was the best equipped and central SOEs, joint-venture and joint-stock were the most R&D-intensive, relatively similar to the cross-ownership R&D pattern in China's manufacturing sector by 1995 or in a similar phase of industrialization (Xuan and Jin 2002).

7.4 Competitiveness indices of firms in different firm ownership categories

7.4.1 Labour and capital productivity

Table 7.10 Competitiveness levels of different sector and firm ownerships, 2000, 2002 and 2005, at the 2000 year price (continued next page)

Firm ownership	Mean (standard deviation) Value-added/labour (million dongs)			Annual growth (%)	Value-added/capital			Annual growth (%)
Central SOEs	41.6	66	109	21.3	0.343	0.3	0.32	-1.4
	(65)	(135)	(352)		(0.348)	(0.4)	(0.24)	
Local SOEs	28.4	44	71.8	20.4	0.369	0.3	0.38	0.68
	(51.1)	(139)	(202)		(0.378)	(0.3)	(0.41)	
Central SOCs			105				0.5	
			(133)				(0.47)	
Local SOCs			64.1				0.4	
			(118)				(0.29)	
SOEs	**33.1**	**52**	**86.3**	**21.1**	**0.36**	**0.3**	**0.39**	**1.38**
	(56.8)	**(134)**	**(242)**		**(0.367)**	**(0.4)**	**(0.33)**	
Collective	16.9	15	21.9	5.36	0.675	0.5	0.63	-1.4
	(95.3)	(40)	(106)		(2.304)	(0.6)	(1.17)	
Private	33.3	56	52.3	9.44	0.492	0.5	0.55	2.19
	(90)	(187)	(242)		(0.883)	(1.3)	(0.9)	
Private limited	39.9	47	48.3	3.88	0.428	0.4	0.44	0.47
	(102)	(156)	(137)		(0.506)	(0.4)	(1.19)	
Joint-stock 1	37.9	38	59.4	9.37	0.451	0.4	0.43	-0.8
	(75.6)	(42)	(121)		(0.457)	(0.2)	(0.3)	
Joint-stock 2	26.1	41	47	12.5	0.452	0.3	0.34	-5.4
	(38.5)	(69)	(183)		(0.599)	(0.3)	(0.35)	
Non-SOEs	**30.1**	**47**	**49.1**	**10.3**	**0.524**	**0.5**	**0.48**	**-1.9**
	(89.9)	**(160)**	**(186)**		**(1.272)**	**(0.9)**	**(0.7)**	
Wholly FIEs	62.5	73	80.4	5.16	0.264	0.2	0.36	6.13
	(103)	(179)	(145)		(0.305)	(0.2)	(0.44)	
Joint-venture 1	176	251	363	15.6	0.269	0.3	0.42	9.48
	(243)	(375)	(606)		(0.261)	(0.4)	(0.33)	
Joint-venture 2	90.1	77	96.3	1.33	0.253	0.2	0.35	6.46
	(152)	(190)	(221		(0.208)	(0.1)	(0.27)	
FIEs	**94.7**	**103**	**107**	**2.47**	**0.265**	**0.2**	**0.36**	**6.46**
	(164)	**(233)**	**(247)**		**(0.287)**	**(0.3)**	**(0.42)**	
Total	***39.6***	***52***	***58***	***7.95***	***0.451***	***0.4***	***0.46***	***0.5***
	(101)	***(162)***	***(199)***		***(0.969)***	***(0.8)***	***(1.11)***	

Source: As for Table 6.1.

Table 7.10 (continued)

Firm ownership	Mean (standard deviation) Value-added/wage			Annual growth (%)	Value-added/ total cost			Annual growth (%)	Number of observation		
Central SOEs	3.22	3.731	5.09	9.6	0.33	0.27	0.35	1.46	522	454	326
	(3.75)	(6.341)	(12.8)		(0.16)	(0.11)	(0.12)				
Local SOEs	3.41	3.234	3.78	2	0.35	0.28	0.38	2.03	945	635	291
	(5.69)	(4.606)	(6.15)		(0.16)	(0.1)	(0.11)				
Central SOCs			4.63				0.43				35
			(4.96)				(0.19)				
Local SOCs			3.13				0.38				45
			(3.62)				(0.11)				
SOEs	**3.34**	**3.413**	**4.74**	**7.3**	**0.34**	**0.28**	**0.35**	**0.88**	**1467**	**1089**	**697**
	(5.08)	**(5.337)**	**(15.5)**		**(0.16)**	**(0.11)**	**(0.12)**				
Collective	3.61	2.461	3.12	-3	0.3	0.25	0.31	0.57	1007	851	986
	(27.1)	(5.092)	(7.91)		(0.12)	(0.08)	(0.1)				
Private	5.39	7.608	7.05	5.5	0.25	0.26	0.31	4.46	4009	3930	5848
	(14.1)	(27.33)	(31.8)		(0.16)	(0.07)	(0.14)				
Private limited	5.35	6.029	5.4	0.2	0.31	0.26	0.34	1.94	2418	4169	8767
	(12.3)	(28.89)	(16.6)		(0.15)	(0.09)	(0.14)				
Joint-stock 1	3.2	2.734	3.71	3	0.31	0.27	0.34	2	126	200	328
	(5.54)	(3.794)	(5.2)		(0.17)	(0.08)	(0.31)				
Joint-stock 2	4.48	4.878	4.7	1	0.33	0.28	0.33	0.32	127	370	1319
	(8.02)	(8.884)	(111)		(0.18)	(0.09)	(0.13)				
Non-SOEs	**4.96**	**6.258**	**5.75**	**3**	**0.27**	**0.26**	**0.32**	**3.32**	**7687**	**9520**	**17248**
	(17.1)	**(26.11)**	**(22.5)**		**(0.16)**	**(0.08)**	**(0.24)**				
Wholly FIEs	3.48	4.305	4.85	6.9	0.31	0.28	0.35	2.75	694	1185	2130
	(4.66)	(15.01)	(8.27)		(0.16)	(0.1)	(0.1)				
Joint-venture 1	7.21	7.258	9.56	5.8	0.33	0.28	0.36	2.2	279	255	226
	(13.9)	(9.9)	(12.1)		(0.18)	(0.1)	(0.12)				
Joint-venture 2	4.5	3.344	5.49	4.1	0.31	0.27	0.34	1.99	76	110	186
	(5.13)	(4.074)	(8.28)		(0.17)	(0.09)	(0.27)				
FIEs	**4.55**	**4.723**	**5.32**	**3.2**	**0.31**	**0.28**	**0.35**	**2.45**	**1049**	**1564**	**2542**
	(8.4)	**(13.82)**	**(8.78)**		**(0.17)**	**(0.1)**	**(0.14)**				
Total	***4.77***	***5.796***	***5.65***	***3.4***	***0.29***	***0.26***	***0.33***	***2.74***	***10203***	***12173***	***20487***
	(14)	***(23.65)***	***(21)***		***(0.16)***	***(0.09)***	***(0.23)***				

Source: As for Table 6.1.

7.4.1.1 Labour productivity

Looking initially to labour productivity, it is evident from Table 7.10 that over the five years 2000-05, most sectors and firm ownership types enjoyed high annual growth in labour productivity (real value-added per employee). Productivity grew by the highest rate of around 21 percent for the whole SOEs sector, reflecting its continued growth in value-added in spite of falling employment (see Table 7.2), while for the overall FIEs labour productivity increased at low rates of 2.47 percent per annum. Of all ownership types, growth was most rapid for central SOEs, local SOEs and joint-venture with SOEs, 21.3, 20.4 and 15.6 percent correspondingly. Productivity also increased relatively rapidly for most private ownership types, with joint-stock without state-owned capital and limited enterprises moving at the highest pace (12.5 percent and 9.44 percent per annum respectively). Joint-ventures with local private firms productivity increased most slowly across all firm ownerships, by merely 1.33 percent.

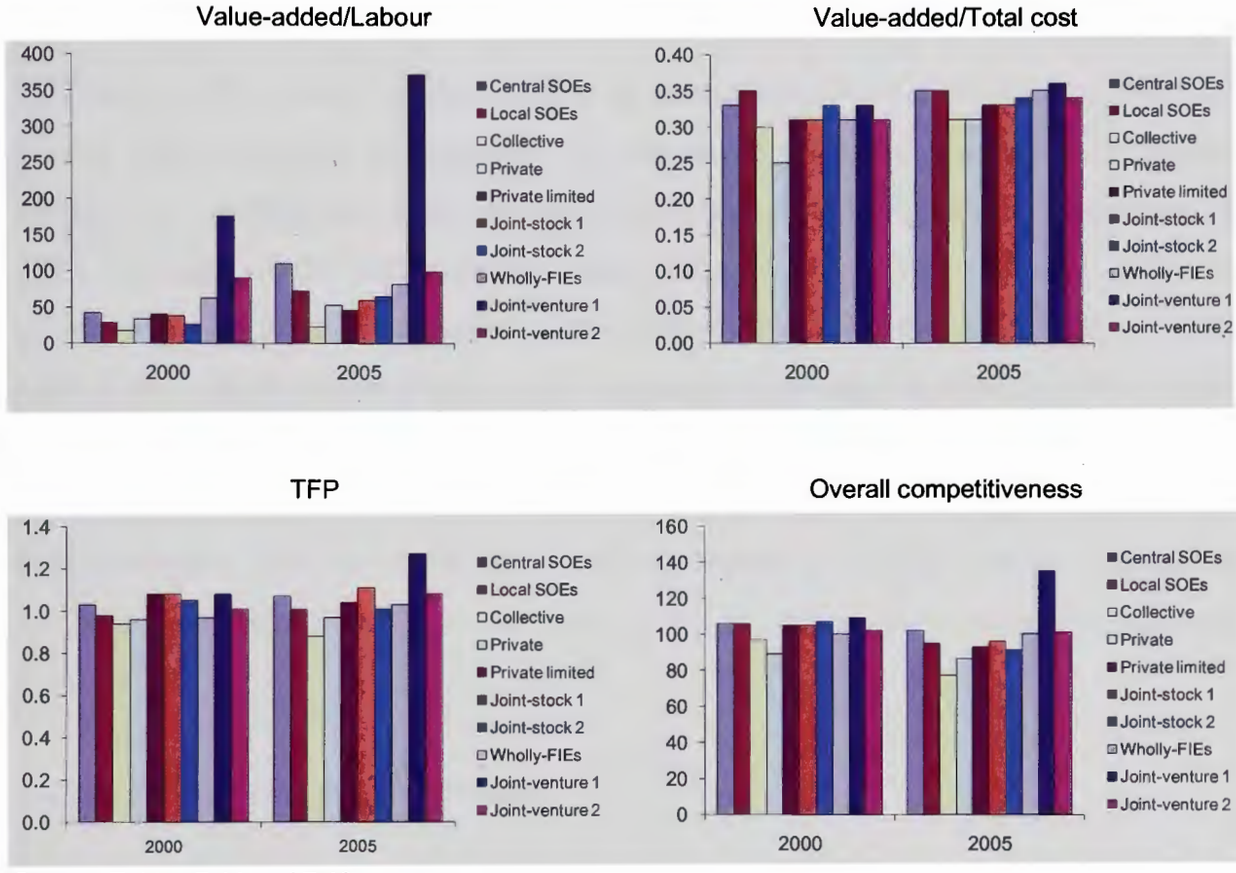
The highest labour productivity growth rates of both central SOEs and local SOEs as noted above, raised the relative productivity level of SOEs compared to FIEs by around 30 percent over the five years. By 2005, SOE labour productivity was somewhat higher, while in 2000 it had been little more than half of the FIE level. Moreover, the level of central SOE competitiveness relative to that of wholly FIEs enterprises reversed over the five years, from around 33 percent lower in the year 2000 to 35 percent higher in the year 2005. Central SOCs came behind central SOEs as the third highest of all firm ownerships in this year.

The productivity of collective enterprises remained the weakest in each of the three years and the next was private limited enterprises in 2000 and other private enterprises in 2005. On the other end of labour productivity distribution, with further strong growth between 2000-2005 joint-ventures with SOEs recorded an outstanding labour productivity level in 2005, which was more than three times higher than that of the next highest category, being foreign joint ventures with Vietnamese private capital and central SOEs in 2000 and 2005 respectively. It should also be noted that the gap between the highest and the lowest in terms of labour productivity (that between joint-

venture with SOEs and collective enterprises) widened from about fourteen fold in 2005 to seventeen fold in 2005.

In short, as with firm size, cross-ownership distribution of labour productivity was very consistent with that of fixed capital, reflecting the strong impact of this production factor.

Figure 7.4 Cross-ownership labour productivity, cost competitiveness, TFP and overall competitiveness levels, 2000 and 2005



Source: Tables 7.11 and 7.12.

7.4.1.2 Capital productivity

Both the cross-ownership capital productivity growth pattern and level of distribution were the opposite to those of labour productivity, except joint-venture with SOEs. While FIEs pointed the highest growth, SOEs showed a very slow pace and non-SOEs demonstrated a drop. At firm level, central SOEs' declined capital productivity was explained directly by its capital growth rates being faster than value-added as indicated

in the first section. Joint-venture with SOEs emerged as the fastest ownership while joint-stock without state-owned capital showed as the slowest.

Nonetheless, in spite of negative growth, the highest capital productivity level was still recorded for non-SOEs and the lowest remained for FIEs in all three years, 2000, 2002 and 2005. The disparity between the former and the latter, however reduced from 99 percent or two times to 32 percent between 2000-2005. Similarly, over the same period, the relative capital productivity differential between non-SOEs and SOEs shrank from 63 percent to 25 percent by 2005.

Likewise, at firm level, on the contrary to labour productivity, despite the negative growth rate, collective demonstrated as the most productive in terms of capital productivity in 2000 and 2005, followed by private, and the positions exchanged in 2002. The least capital productive was joint-venture with non SOEs in 2000, 2002 and central SOEs in 2005. In contrast, central SOCs demonstrated a high position, third highest and highest in labour and capital productivity ranking respectively. While joint-venture with SOEs was the strongest by labour productivity, but stood at the medium-low level by capital productivity. Such pattern of capital productivity showed that as for R&D resources, local non-SOEs tried utilizing capital most efficiently to compensate for their substantial advantages of fixed capital PC-net as analysed in the previous sections.

7.4.2 Wage and cost competitiveness

7.4.2.1 Wage competitiveness

As for labour productivity, over the 2000-05 period all three ownership sectors experienced relatively high growth rates of wage competitiveness. However, only in FIEs did all firm ownerships have approximate growth rates, while the opposite patterns featured in both locally-owned sectors. For SOEs, the growth rate of central SOEs was ten times higher than local SOEs. In particular, for non-SOEs, wage competitiveness of joint-stock without state capital and private rose most rapidly that of collective which fell.

Distribution of value-added per wage presented rather similar for three sectors but varied across twelve ownerships. Results from both estimation methods showed that, whereas applying the highest payment rate, joint-venture with SOEs exploited wage most productively or spent the lowest wage payment to produce one value-added unit, in 2000, 2005 and presented as the second in 2002. On the contrary, collective paid the lowest rate to employees as indicated earlier, but obtained the lowest wage productivity or had to spend the highest total wage payment per value-added unit, in 2002 and 2005. These results provided a more empirical basis for the theory of using high labour cost or skilled labour to strengthen competitiveness of firms in industrializing countries. But like capital productivity, wage competitiveness for private recorded relatively high, appearing in the top three in all three years. Joint-stock without state-owned capital and private had been significantly improved from the middle to the second and the third highest position in 2005 as a direct result of the rapid growth mentioned above.

Within FIEs, wholly FIEs showed substantially lower wage productivity, only around a half of the joint-venture, whereas the formers' labour cost was around two-thirds of the latter. This can be partly explained by a higher proportion of FIEs in labour intensive, low value-added industries like garments, leather and furniture, than that of joint-venture with SOEs.

7.4.2.2 Cost competitiveness

As to capital productivity, in general, low cost competitiveness growth rates occurred for all three sectors of which non-SOEs raised cost efficiency fastest, about three times that of the SOEs which were the slowest. Most firm ownerships also experienced a slow improvement in cost productivity and even a fall occurred. The fastest, nevertheless was the locally-owned private firm,

The distinct property of cost efficiency distribution was that variations between the three sectors and firm ownerships did not posed as large as by the three previous competitiveness indices, whereas that of non-SOEs was slightly lower than SOEs and FIEs. Across firm ownerships, again the highest position was hold by joint-venture with SOEs if one did not take into account both SOCs as new ownerships consisting of very

small number of firms compared to the others. The lowest level was also held by collectives in 2002 and privates in 2000 and 2005.

It should be noted that local SOEs showed stronger levels than central SOEs by only the cost competitiveness indicator. The two new SOEs firm ownerships, central SOCs and local SOCs, demonstrated that not only were their spent costs more efficient than traditional SOEs, but they were even the most productive of all ownerships. But SOCs competitiveness levels relative to the other need to be translated and used cautiously because of their small number as noted above and the very short time of operation compared to all other ten ownership types.

In non-SOEs, as by all previous competitiveness indices except capital productivity, joint-stock without state-owned capital had the highest cost productivity, followed by private limited in 2000 and 2005 and another type of joint-stock in 2002. For FIEs, wholly FIEs achieved medium cost competitiveness in 2000, and upper-medium in 2005. Joint-venture with non-SOEs, was the lowest within this sector and below medium level on the cost competitiveness ladder across all firm ownership types. This once again implied that wages only accounted for a small portion of the total cost.

7.4.3 Total factor productivity

Unlike all previous competitiveness indices by which one sector ownership held the highest position in all three years, based on TFP, each ownership sector presented the first, second and third place each year. Nevertheless, for firm ownerships, the distribution was similar to labour productivity with joint-venture with SOEs standing out as the strongest in all three years, followed correspondingly by central SOCs, joint-stock with state-owned company and central SOEs in 2000, and 2005. Local SOEs and local SOCs however remain at considerably lower levels. Similarly, collective and private presented as the weakest and the next in all three years of 2000, 2002 and 2005.

It is notable that, compared to the relative competitiveness levels of labour productivity or total cost efficiency, those of TFP exchanged for firm ownerships in the same sector. Of non-SOE firms, joint-stock having state-owned capital displayed the highest TFP

level, followed by private limited and joint-stock without state capital. Within FIEs, joint-venture with non-SOEs indicated a higher TFP than wholly FIEs in all three years.

Table 7.11 TFP and overall competitiveness of sectors and firm ownerships, 2000, 2002 and 2005

Firm ownership	TFP level			Overall competitiveness (%)		
	2000	2002	2005	2000	2002	2005
Central SOEs	1.03	1.11	1.07	106	105	102
Local SOEs	0.98	1.01	1.01	106	101	94.8
Central SOCs			1.12			114
Local SOCs			1.01			97.2
SOEs sector	**1**	**1.05**	**1.07**	**106**	**103**	**99**
Collective	0.94	0.85	0.88	97.1	87.6	77
Private	0.96	0.97	0.97	89	95.6	86.4
Private limited	1.08	1.03	1.04	105	99.4	92.7
Joint-stock 1	1.08	1.06	1.11	105	101	96
Joint-stock 2	1.05	1.03	1.01	107	102	91.1
Non-SOEs	**1.01**	**0.99**	**1.01**	**96.3**	**96.9**	**89.6**
Wholly-FIEs	0.97	1	1.03	100	100	100
Joint-venture 1	1.08	1.26	1.27	109	114	135
Joint-venture 1	1.01	1.01	1.08	102	100	101
FIEs	**1.01**	**1.05**	**1.05**	**103**	**102**	**103**
Total	***1***	***1***	***1***	***89***	***94***	***101***

Source: As for Table 6.1.

Higher TFP level of FIEs, central SOEs and joint-stock firms were most probably associated with their stronger technology embodied in fixed capital, labourers who are better qualified and higher-paid . The technological strength of these firm ownerships also resulted from higher tech industries in which most of them operated, advantages of their larger firm size or economy of scales.

7.4.4 Overall competitiveness

The three last columns of Table 7.11 presents the overall competitiveness indicators for all sectors and firm ownerships. The SOE sector was the strongest in 2000 and 2002, followed by FIEs, but in 2005 these two sectors exchanged positions. Non-SOEs, accordingly, the largest in terms of numbers and employment, displayed as the least competitive in all three years. Moreover, it tended to lag further from the strongest in competitiveness by less than 7 percent in 2000 to 13 percent in 2005.

Of all firm ownerships and in all three years, 2000, 2002 and 2005, joint-venture with SOEs was evaluated as the strongest in the overall competitiveness indicator exceeding the lowest 20 percent by 2000, increasing to 55 percent by 2005. Central SOEs held the second strongest position by 2002 and the third in 2000 and 2005. Limited central SOCs showed its potential with the second position by 2005. Local SOEs however reached a moderate ranking level, only above some non-SOEs, except for both types of joint-stock.

In the other end of competitiveness ranking spectrum, collective and private was the lowest by 2002, 2005 and 2000 correspondingly. Private limited also reached indicators generally lower than SOE and FIE types. Of the non-SOEs, both types of joint-stock were the strongest and these firm ownerships also held medium-high positions in the ranking across all firm ownerships. Joint-stock with state-owned capital achieved the second and the third highest position by 2000 and 2002. The medium positions were held by wholly FIEs, the largest ownership by virtual criteria as analysed earlier, except in number and joint-venture with non-SOEs. In sum, the positions in competitiveness ranking by single and overall indicators for sector and firm ownership types were mainly consistent with their relative levels of competitive advantages as analysed in the previous part of the chapter.

7.4.5 Cross-ownership competitiveness indicators within industries and sector sizes

7.4.5.1 Cross-ownership competitiveness indicators within industries

Table 7.12 displays the estimated comparative competitiveness of major types of firm ownerships within four industries, with food, garment, chemicals and automobiles representing the resource-intensive, labour-intensive, intermediate and capital, and technology-intensive groups of industries. The overwhelming feature was that cross-ownership relative competitiveness levels within each industry differed from those in the whole manufacturing sectors and in another industry with the disparity degree posing greatest by labour productivity. For the food and beverage sector (ISIC15) as with the natural resource-intensive industry, these differentials were not commendable. But for garment labour-intensive industries, the relative competitiveness levels

significantly differed from those of the whole manufacturing sector. Both FIEs types did not show a significantly higher level by virtual indices. In contrast, non-SOEs and private limited pointed to the highest labour productivity levels across all firm ownerships and other stronger competitiveness records as compared to that of SOEs and central SOCs respectively.

Table 7.12 Relative competitiveness of all sectors and the major firm ownerships in four two-digit industries: (%), 2005

Firm ownership	Value-added/employee				Value-added/wage			
	15	18	24	34	15	18	24	34
Central SOEs	77.3	87.8	59.3	71.6	69.0	60.7	50.8	48.1
SOEs	**63.4**	**68.7**	**52.2**	**116.0**	**78.0**	**69.0**	**58.7**	**53.2**
Private limited	40.9	112.0	23.1	39.6	103.0	99.7	68.9	76.0
Non-SOEs	**48.3**	**101.0**	**22.3**	**39.4**	**128.0**	**97.3**	**62.3**	**64.7**
Wholly FIEs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Joint-venture	184.0	99.8	259.0	1199.0	125.0	103.0	142.0	541.0
FIEs	**107.0**	**98.9**	**121.0**	**268.0**	**101.0**	**98.7**	**106.0**	**167.0**
	Value-added/capital				**Value-added/total cost**			
	15	**18**	**24**	**34**	**15**	**18**	**24**	**34**
Central SOEs	97.4	97.4	114.0	128.0	108.0	100.0	90.7	109.0
SOEs	**127.0**	**90.5**	**129.0**	**150.0**	**110.0**	**101.0**	**92.2**	**106.0**
Private limited	130.0	85.8	130.0	140.0	101.0	99.3	100.0	98.5
Non-SOEs	**164.0**	**94.0**	**134.0**	**190.0**	**97.0**	**98.1**	**96.7**	**97.1**
Wholly FIEs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Joint-venture	116.0	80.3	150.0	221.0	109.0	102.0	101.0	136.0
FIEs	**103.0**	**98.3**	**108.0**	**118.0**	**102.0**	**99.9**	**100.0**	**106.0**

Notes: 15: Food & beverage; 18: Garments; 24: Chemicals; and 34: Automobiles.
Source: As for Table 6.1.

It should be noted in addition that the firm ownership competitiveness levels also differed between different segments of one two-digit industry. As showed in Table 7.13 for wearing apparel except fur (ISIC 181), the relative productivity levels of non-SOEs and private limited were around 10 percent lower than FIEs and joint-venture, but for dressing, dying and processing fur (ISIC 182), that of the former equalled to only about one-third of the latter.

Within higher technology industries like chemicals and automobiles, the FIEs sector and both wholly foreign-owned and joint-venture demonstrated higher relative competitiveness levels than those in the whole manufacturing sectors and in low-technology industries in three of four indicators, especially labour productivity. Joint-venture with SOEs highest records were in all four competitiveness indicators while

those in entire manufacturing were two. The largest cross-ownership competitiveness gap within chemicals and automobiles also exhibited between labour productivity levels of joint-venture with SOEs and private limited, but it was up to about 11 times and 40 times, much higher than the disparity of the sector as the whole.

Table 7.13 Relative competitiveness of all sectors and the major firm ownership in the branches of the garment industry (D18), 2005

Firm ownership	Relative productivity				Relative productivity			
	Labour	Wage	Capital	Cost	Labour	Wage	Capital	Cost
	Wearing apparel except fur				Dressing, dying, processing fur			
Central SOEs	113.96	164.70	102.60	99.94				
Local SOEs	191.26	146.40	153.10	98.34				
SOEs	**145.55**	**145.00**	**110.50**	**98.62**				
Private limited	89.11	100.20	116.40	100.60	31.30	45.00	133.00	86.90
Non-SOEs	**99.38**	**102.70**	**106.80**	**102.10**	**27.60**	**44.70**	**193.00**	**58.80**
Wholly FIEs	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Joint-venture	100.24	97.52	124.50	97.94				
FIEs	**105.83**	**103.40**	**100.90**	**101.20**	**93.60**	**83.20**	**123.00**	**46.90**

Source: As for Table 6.1.

7.4.5.2 Competitiveness of firm ownerships combining firm size

Table 7.14 Competitiveness indicators of sector sizes combining with all sector and major firm ownerships (%), 2005

Firm ownership	Productivity				Productivity				Number of firms	
	Labour	Wage	Capital	Cost	Labour	Wage	Capital	Cost		
	SMEs				LEs				SMEs	LEs
Central SOEs	145.0	6.4	0.3	0.3	94.7	4.5	0.3	0.4	93.0	237.0
Local SOEs	65.0	3.3	0.4	0.3	76.6	4.1	0.4	0.4	134.0	159.0
Central SOCs	228.0	10.0	0.7	0.5	74.9	3.3	0.5	0.4	7.0	28.0
SOEs	**95.5**	**4.8**	**0.4**	**0.3**	**80.2**	**4.7**	**0.4**	**0.4**	**363.0**	**618.0**
Private limited	46.2	5.3	0.4	0.3	41.5	4.1	0.6	0.4	9180.0	771.0
Joint-stock 1	54.3	3.6	0.4	0.3	64.8	3.8	0.5	0.4	170.0	158.0
Non-SOEs	**48.7**	**5.9**	**0.5**	**0.3**	**42.3**	**3.8**	**0.6**	**0.3**	**17877.0**	**1317.0**
Wholly FIEs	92.8	5.3	0.3	0.3	60.0	4.2	0.5	0.4	1333.0	838.0
Joint-venture	344.0	8.3	0.3	0.3	384.0	11.0	0.5	0.4	124.0	108.0
FIEs	**115.0**	**5.6**	**0.3**	**0.3**	**94.1**	**4.9**	**0.5**	**0.4**	**1586.0**	**1008.0**

Source: As for Table 6.1

From the figures in Table 7.14, the interesting features of relative competitiveness across ownerships within each sector size can be identified. Non-SOEs with small and medium-sized firms achieved the highest wage competitiveness but the lowest cost

competitiveness. In contrast, non-SOEs with large size recorded the highest capital productivity but lowest labour and wage productivity. The contrasting competitiveness indicators also occurred for FIEs within the SMEs sector, which achieved the highest labour productivity level but showed the lowest capital productivity, while FIEs within LEs indicated as the most efficient sector.

When examining firm ownerships combined with firm size, labour productivity and wage competitiveness, joint-venture with SOEs employing between 500 and 999 labours emerged as strongest, followed by local SOEs with the same size. But by capital productivity and cost competitiveness SOCs being SMEs stood out as the strongest and the next was local SOEs with 1000-4999 employees.

On the other end of firm competitiveness ranking, the lowest labour productivity records were consequently found in private limited with 1000-4999 employees and with 500-999 employees. The least competitive in terms of wages, capital and cost productivity were correspondingly local SOEs, central SOEs and joint-venture with SOEs which all had the small size of 10 to 49 employees.

In other words, with the exception of SOCs, the joint-venture and central SOEs with 500-999 employees were the strongest, while several ownerships with 10-49 employees or private limited with 1000-4999 employees were seen mostly as the weakest by virtually all indicators or labour productivity correspondingly. The competitiveness positions of these firms reflected the incorporation of the highest competitive positions of larger firms especially the second and third largest and joint-venture with SOEs and newly established SOCs as analysed in the previous chapter and sections.

7.5 The impact of production factors on cross-ownership competitiveness

7.5.1 The impact of principal production factors

7.5.1.1 Correlation analysis results

Two matrixes present the correlation coefficients between three competitiveness indices, labour productivity, cost efficiency, TFP and determinants in two years 2002 and 2005.

LN: Logarithm

C: Cost efficiency

L: Labour productivity

M: Input material per employee

F: Fixed capital per employee

W: Wages per employee

FDI: Dummy variable = 0 if firms are FIEs, otherwise = 1

PC: Number of PCs/employee

LAN: The degree to which firm uses PC connected with local area network, measured by 0, 1, 2

NET: The degree to which firm uses PC connected to internet, measured by 0, 1, 2

S: Number of employees of the firm

Three main features can be stated from these results.

Firstly, most variables highly correlated with each other, except year, internet and website-using level. Secondly, in term of demand-side factors, export degree showed negative association with labour productivity, total cost efficiency and a significantly positive interaction on TFP in 2002, however all three coefficient estimations were statistically insignificant. The correlation results also indicated that all three competitiveness indices positively correlated with fixed capital, wage, PC per employee as well as technology-intensive industries and negatively related to year or the newly-established firms. Thirdly, the correlation coefficients were not sufficiently large enough to cause the substantial multicollinearity, which is a potential problem for the regression coefficients since some these variables related to each other.

Table 7.15 Correlation matrix, 2002

	LNL	LNC	LNTFP	LNF	LNW	LNM	LNS	FDI	LNPC	LAND	NET	WEB
LNL		0.44	0.73	0.45	0.61	0.65	0.02	0.23	0.42	-0.3	-0.16	-0.11
LNC	0.44		0.44	-0.1	0.04	-0.38	0.09	-0	-0.04	-0	-0.03	0.01
LNTFP	0.73	0.44		-0	0.41	0.37	0.04	0.07	0.17	-0.1	-0.1	-0.06
LNF	0.45	-0.1	-0.03		0.41	0.5	0.02	0.36	0.44	-0.3	-0.18	-0.12
LNW	0.61	0.04	0.41	0.41		0.55	0.15	0.39	0.4	-0.3	-0.28	-0.15
LNM	0.65	-0.4	0.37	0.5	0.55		-0.1	0.21	0.46	-0.2	-0.12	-0.11
LNS	0.02	0.09	0.04	0.02	0.15	-0.08		0.17	-0.5	-0.4	-0.38	-0.25
FDI	0.23	-0	0.07	0.36	0.39	0.21	0.17		0.19	-0.2	-0.29	0
LNPC	0.42	-0	0.17	0.44	0.4	0.46	-0.5	0.19		-0.2	-0.1	-0.09
LAND	-0.3	-0	-0.13	-0.3	-0.3	-0.23	-0.4	-0.2	-0.22		0.38	0.23
NET	-0.2	-0	-0.1	-0.2	-0.3	-0.12	-0.4	-0.3	-0.1	0.38		0.26
WEB	-0.1	0.01	-0.06	-0.1	-0.2	-0.11	-0.2	0	-0.09	0.23	0.26	

Source: Author's calculations.

Table 7.16 Correlation matrix, 2005

	LNL	LNC	LNTFP	LNF	LNW	LNM	LNS	FDI	LNPC	LAND	NET	WEB
LNL		0.5	0.47	0.42	0.55	0.59	0.01	0.18	0.41	-0.13	-0.08	-0.06
LNC	0.5		0.5	-0.1	-0	-0.39	0.06	-0	-0.01	-0.02	-0	0.01
LNTFP	0.47	0.5		-0.5	0.18	0.01	0.05	-0.1	-0.01	0.02	0.01	0.01
LNF	0.42	-0.1	-0.45		0.39	0.52	0.01	0.3	0.43	-0.15	-0.12	-0.06
LNW	0.55	-0.01	0.18	0.39		0.52	0.14	0.36	0.44	-0.13	-0.15	-0.02
LNM	0.59	-0.39	0.01	0.52	0.52		-0.1	0.18	0.43	-0.12	-0.08	-0.08
LNS	0.01	0.06	0.05	0.01	0.14	-0.06		0.21	-0.43	-0.24	-0.22	-0.09
FDI	0.18	-0.02	-0.06	0.3	0.36	0.18	0.21		0.21	-0.12	-0.16	0.06
LNPC	0.41	-0.01	-0.01	0.43	0.44	0.43	-0.4	0.21		-0.06	-0.05	0.02
LAND	-0.1	-0.02	0.02	-0.2	-0.1	-0.12	-0.2	-0.1	-0.06		0.61	0.61
NET	-0.1	-0	0.01	-0.1	-0.1	-0.08	-0.2	-0.2	-0.05	0.61		0.51
WEB	-0.1	0.01	0.01	-0.1	-0	-0.08	-0.1	0.06	0.02	0.61	0.51	

Source: Author's calculations.

7.5.2 Regression analysis findings

Table 7.17 presents the regression results on each competitiveness indicator using consecutively two sets of explanatory variables. The first or model I consist of some underlying traditional and new competitive advantages. The second is constructed as the first added TFP which is widely regarded as the technology level in order to explain

more sufficiently labour productivity. Similarly, for fully explaining other competitiveness indices being cost efficiency and TFP, the first data panel was labour productivity which is widely regarded as the combination of levels of labour skill and modern equipment.

The results of regressions from model I indicated wage and material cost as the only variables having the largest and statistically significant coefficient on firm competitiveness. But the findings from model II, featured by more dependent variables and high power of explanation, showed that disembodied and embodied technology, correspondingly presented by TFP and fixed capital equipment per unit of labour, were the most important determinants of labour productivity measured by value-added per employee. These findings confirmed the reasons why the best-equipped FIEs reached the highest labour productivity, stated in Section 7.4.1. However, the level of fixed-assets negatively correlated with cost efficiency and especially with TFP.

Payment to an employee also had a significantly positive effect on labour productivity but to a smaller extent than that in model I since TFP partly reflected labour quality or the payment rate. It should be noted, whereas labour cost directly negatively related to cost efficiency or the ratio of value-added over total cost, it substantially positively correlated to labour productivity which was a combination of technology degree of machinery and equipment as well as labour skills, thereby subsequently had a very strong impact on cost efficiency. The wage rate also had a positive coefficient on TFP to a small extent, but strong statistical significance. In other word, contrary to the normal thinking and traditional comparative advantage theory, the finding supported the theory of new or competitive advantage relying on high rather than low labour cost or achievement of cost competitiveness through using high paid labour.

Unlike labour costs, material cost was only positively associated with labour productivity and had negative relation with cost efficiency and TFP. It should be emphasized that a positive coefficient of the material cost on labour productivity was about a half of that of labour cost but the negative impact of the former on cost efficiency was about seven times larger than that of the latter. Thereby, unlike labour cost, these results recommended cutting material cost as a method of increasing firm competitiveness.

Based on model I, it was found that as the first factor in the group of new competitive advantages, firm organization had a small positive effect on three competitiveness indices but was statistically significant. Nevertheless, from model II with a more powerful explanation of variables, firm size impact and its negative correlation on labour productivity in 2005, pointed to being small and statistically insignificant.

The findings on ICT, as an essential component of new manufacturing and potential strong competitive advantages, show that ICT initially played a commendable role in improving manufacturing firm competitiveness in Vietnam. Personal computers, the first popular IT instrument, had a positive effect on all competitiveness indices, labour productivity, cost efficiency and TFP in both 2002 and 2005, except TFP in 2002. PC network within a firm showed a considerably positive and significant effect on cost competitiveness and TFP. In addition, the other PC-related distant communication equipment such as internet and websites appeared to be positively associated with firm competitiveness with virtual coefficients having positive signs. However, these quantified impacts of communication technology on firm competitiveness were still very small and insignificant. ICT thereby should be evaluated as the potential competitive advantages of manufacturing firms in Vietnam rather than substantial, as in developed countries.

As far as ownership was concerned, it was found that foreign ownership had non-substantial negative relations with all three indices of competitiveness in both of the two regressions. The only differential was that coefficients in the full model were smaller than the primary. These results supported the evaluation that overall foreign ownership was not a significant contributor to competitiveness of the manufacturing sector in Vietnam.

Table 7.17 Regression results of the impact of production factors on firm competitiveness, 2002 and 2005

Independent variable	Labour productivity		Cost efficiency		TFP	
	Coeff.	t	Coeff.	t	Coeff.	t
C	-0.375	-1.57	-1	-4.24	-0.41	-4.32
LNF	0.072	4.1	0.04	2.325	-0.11	-16.1
LNW	0.633	15.1	0.49	11.75	0.17	10.3
LNM	0.367	20.1	-0.4	-25	0.09	12.4
LNS	0.067	2.93	0.07	3.273	0.02	2.62
FDI	-0.128	-2.26	-0.1	-2.65	-0.03	-1.42
LNPC	0.122	3.93	0.13	4.33	0.03	2.28
LAN	-0.049	-0.93	-0.1	-0.96	-0.02	-1.12
NET	0.049	0.97	0.06	1.239	0.01	0.33
WEB	0.064	0.96	0.06	0.847	-0	-0.01
$\overline{R^2}$	0.525		$\overline{R^2}$	0.246	$\overline{R^2}$	0.22
C	1	8.27	-0.6	-17.7	-0.46	-11.6
LNF	0.276	22.3	-0	-20.1	-0.11	-27.7
LNW	0.209	7.2	-0.1	-10	0.03	3.22
LNM	0.174	13.7	-0.8	-244	-0.01	-1.17
LNS	0.011	0.81	0.01	1.598	0	0.99
FDI	-0.058	-1.62	-0	-3.53	-0	-0.22
LNPC	0.057	2.85	0.01	2.663	-0	-0.47
LAN	-0.019	-0.54	-0	-0.1		-0
LNTFP	2.241	51.2				
LNL			0.97	267.2	0.25	51.2
$\overline{R^2}$	0.79		$\overline{R^2}$	0.979	$\overline{R^2}$	0.69

Table 7.17 (continued)

Independent variable	Labour productivity		Cost efficiency		TFP	
	Coeff.	t	Coeff.	t	Coeff.	t
C	0.6399	3.19	-0.03	-0.14	0.33	2.466
LNF	0.08	4.32	0.06	3.12	-0.2	-14.1
LNW	0.5487	13.9	0.35	9.12	0.18	7.07
LNM	0.319	17.4	-0.46	-25.5	0.01	0.844
LNS	0.048	2.73	0.05	2.97	0.02	2.079
FDI	-0.138	-2.5	-0.16	-2.99	-0.1	-2.56
LNPC	0.1658	5.68	0.17	6.06	0.07	3.711
LAN	-0.104	-2.1	-0.11	-2.25	-0	-0.44
NET	0.1211	2.16	0.11	2	0.04	1.126
WEB	-0.013	-0.3	-0.01	-0.32	-0	-1.42
$\overline{R^2}$	*0.4416*		$\overline{R^2}$	*0.23*	$\overline{R^2}$	*0.09*
C	0.082	0.73	-0.67	-22	0.07	1.95
LNF	0.5788	39.2	-0.02	-6.09	-0.2	-59.5
LNW	0.1291	4.88	-0.18	-24.1	0.04	4.957
LNM	0.2044	17.1	-0.76	-220	-0	-7.42
LNS	-0.011	-1	0	1.53	0.01	3.585
FDI	-0.053	-1.5	-0.03	-3.07	-0	-0.2
LNPC	0.0302	1.6	0.01	2.56	0.02	2.656
LAN	-0.086	-3	-0.02	-2.36	0.02	1.758
NET	0.0857	2.44	-0.01	-0.77	-0	-1.39
LNTFP	2.4681	57.7				
LNL			0.96	263	0.24	57.73
$\overline{R^2}$	*0.7667*		$\overline{R^2}$	*0.97*	$\overline{R^2}$	*0.72*

Note: Dependent variables: labour productivity, cost efficiency and TFP.
Source: Author's calculations.

7.5.3 The impact of R&D personnel and activities

RDP: number of R&D personnel/employee

RDEX: R&D expenditure/sales

DIP: number of degree-holders/employee

To examine whether human capital, researchers and R&D activities had impact on firm competitiveness, ratios of degree holders, R&D personnel over total employee and R&D expenditure over total sales were selected as explanatory variables in both

regression models. In model I, the regression findings indicated that only the share of degree-holders regarded as human capital had considerable significant interaction with all three competitiveness indices. In model II with more power of explanation, degree-holding staff however had insignificantly very little effect on both labour productivity and cost efficiency, but only significantly positive unsubstantial association with TFP.

Table 7.18 Regression on the impacts of R&D on firm competitiveness, 2002

	Labour productivity		Cost efficiency		TFP	
	Coeff.	t	Coeff.	t	Coeff.	t
C	-0.44	-2.56	-1	-5.9	-0.6	-10
LNF	0.088	4.75	0.05	2.87	-0.09	-14
LNW	0.67	16	0.5	12.2	0.19	13.9
LNM	0.36	17.4	-0.4	-21.5	0.09	12.4
LNPC	0.013	0.48	0.03	0.98	-0.01	-1.3
DIP	0.479	2.62	0.41	2.26	0.2	3.19
RDP	-0.03	-0.25	0.05	0.35	-0.02	-0.3
RDEX	-0.09	-1.32	-0.1	-1.27	-0.02	-0.9
$\overline{R^2}$	*0.52*		$\overline{R^2}$	*0.22*	$\overline{R^2}$	*0.28*
C	0.893	7.51	-0.6	-20.3	-0.49	-13
LNF	0.278	21.3	-0	-10.9	-0.11	-26
LNW	0.238	8.07	-0.1	-20.4	0.03	2.71
LNM	0.169	11.7	-0.8	-216	-0	-0.7
LNPC	0.039	2.16	0.01	3.1	-0.02	-2.5
DIP	0.044	0.36	-0.1	-1.95	0.08	1.86
RDP	4E-04	0	0.08	3.61	-0.01	-0.2
RDEX	-0.04	-0.95	0	0.14	0	0.1
LNTFP	2.218	46.2				
LNL			0.97	247	0.25	46.2
$\overline{R^2}$	*0.786*		$\overline{R^2}$	*0.98*	$\overline{R^2}$	*0.68*

Source: Author's calculations.

In addition, the findings show that R&D activity did not play a considerable role in upgrading competitiveness of manufacturing firms in Vietnam. R&D personnel appeared to have more significant positive correlation with labour productivity and cost efficiency while R&D expenditure associated positively with only TFP. A negative relationship was even found between the share of research in total staff and TFP, between R&D expenditure-total sale ratio, and labour productivity and TFP. The low impact of R&D on competitiveness indices can be firstly explained by a very earlier

indicated small percentage of firms having R&D activities, especially non-SOEs and wholly FIEs. Another plausible reason is the limited quality of R&D staff and their research work that in turn was caused by the poorly-qualified training, ineffective incentives for R&D staff and inefficient monitoring mechanisms on R&D expenditure. These findings in Vietnam were similar to results of a study on the role of R&D activities for firm productivity performance in China (Liu & Zhang, 2002) and other ASEAN countries.

7.6 Key findings and overall conclusion

1. During the 20 years of economic reform in Vietnam (1986-2005), virtually all firm ownerships within the manufacturing sector grew steadily. The highest annual average growth rate was pronounced by FIEs over 1990-2000 and by non-SOEs between 2000 and 2005. As a result, the composition of the manufacturing sector by ownership changed very dramatically and profoundly, following two remarkable opposite directions. The SOEs sector moved from the dominant to the smallest, while FIEs moved from the excluded before 1988 to the largest only within ten years. Non-SOEs shifted from the discriminated sector to the larger than SOEs. Simultaneously, at firm level, wholly-owned FIEs replaced central SOEs as the largest firm ownership in terms of all input and output indicators.

2. With respect to fixed assets, wage payment, ICT and R&D activities as the sources of competitiveness, of firm ownerships, the most and the least intensive was respectively joint-venture with SOEs and private-limited. There was a marked rise for SOEs in term of both equipment and wage rates with the opposite occurring for all FIEs ownerships within 2000 and 2005, resulting in poorer levels of wholly FIEs for these variables. R&D activities were very weak for collective, private and joint-venture with non-SOEs. There remained a considerable equipment gap between foreign and locally-owned firms of which central SOEs narrowed the equipment gap substantially and invested most on R&D.

The cross-ownership competitiveness distributions found were pronounced consistent with relative competitive advantages. Overall competitiveness levels were only slightly different between sectors, but there remained significant disparity between joint-venture with SOEs as the highest, and collective and private as the lowest in terms of most indicators except capital productivity by which the positions completely reversed for these firm ownerships. Central SOEs came in as the second and the third strongest by labour productivity, TFP and overall competitiveness, and local SOEs was second in terms of total cost efficiency. These results provided additional empirical evidence on the relative simplicity of a popular opinion that SOEs had very low efficiency and privatization was a mainstream solution to deal with this firm ownership type.

3. For non-SOEs, both joint-stock types performed most strongly, suggesting the development of this firm type in the coming years. Private limited, the most crowded and the second largest in terms of number of labourers, only stood on the below medium level by all indicators and both estimations methods. Collective and private had opposite ranks depending on the competitiveness indicators; the weakest by labour productivity and TFP, but the strongest by capital productivity, and the latter took the second place by wage competitiveness. These results again emphasize that, as to firm size, to evaluate and interpret firm-level competitiveness ranking, it is essential to highlight measures or indicators to avoid misleading conclusionss since the estimations based on the indices sound similar, labour productivity and capital productivity and cost efficiency, led to opposite comparative results. Similarly, relative competitiveness levels between ownerships also substantially varied depending on the industry in which the firm operated.

4. The results of this chapter also contribute to enrich knowledge on different characteristics between the two ownership types of the FIEs sector, joint-venture with SOEs and wholly FIEs, in terms of all competitiveness determinants and levels. It is emphasized that between the five years of 2000-05s wholly FIEs has become the largest firm ownership within the manufacturing sector, but both its competitiveness drivers and performance had rapidly degraded, implying the

unsustainability of Vietnamese manufacturing growth in the coming years if these trends are not reversed.

5. Correlations and regression results additionally confirmed that competitiveness of different manufacturing sectors and firm ownerships in Vietnam still largely relies on quantity of traditional factors rather than on new technology and R&D activities. The findings also implied the strong positive impact of more knowledge-intensive inputs on firm competitiveness by any measures.

Appendix Table 7.1 Total manufacturing number of firms, labour, capital, estimated value-added across ownerships and tax payment (at the year 2000 price), Vietnam, 2000 and 2005

Firm ownership	Number of firms		Number of employees		Capital (millions dong)		Estimated value-added (millions dong)		Tax payment	
	2000	2005	2000	2005	2000	2005	2000	2005	2000	2005
Central	561	533	349849	376806	50340940	112277545	16020594	25796084	6104117	10026340
Local SOEs	925	445	313475	208850	26636831	29053686	8766324.8	11168532	3449754	4521293.4
Total SOEs	**1486**	**978**	**663324**	**585656**	**76977771**	**141331231**	**24786918**	**36964616**	**9553871**	**14547633**
Collective	1036	1046	43379	44995	1158469	1796014.5	528233.88	685391.82	60572	54152.896
Private	4105	6457	99688	201355	5087610	16257660	2431679.1	6736751.7	292525	745849.78
Private limited	2397	9955	317938	727372	20167003	83498736	6877488.9	25941502	1300043	4164516.8
Joint-stock 1	124	1421	37038	124144	3337265	22752676	408633.02	7189457.4	73007	1017874.4
Joint-stock 2	123	328	26106	180937	1870905	15765945	1059064	6129775.4	241633	2072530.7
Total private	**7785**	**19207**	**524149**	**1278803**	**31621252**	**140071032**	**11305099**	**46682878**	**1967780**	**8054924.5**
Wholly FIEs	697	2172	275119	987279	61493459	167020153	12744697	46461162	1943732	6420318.5
Joint-venture 1	268	232	69035	78533	56652538	58874846	12061966	20249563	3789397	11925032
Joint-venture 2	78	191	13858	56310	3434680	8498659.5	1111248.7	3041661.7	167155	527995.59
Total FIES	**1043**	**2595**	**358012**	**1122122**	**121580677**	**234393658**	**25917911**	**69752387**	**5733129**	**18873346**
Total	***10314***	***22780***	***1543590***	***2986581***	***230179700***	***515795921***	***62009929***	***153399882***	***17422006***	***41475904***

Source: As for Table 6.1.

Appendix Table 7.2 Share of each ownership combining sector size in total input and output of manufacturing SME and LE sectors, in Vietnam, 2005

Firm types	Firm number		Employment		Capital		Value-added	
	SMEs	LEs	SMEs	LEs	SMEs	LEs	SMEs	LEs
Central SOEs	0.72	1.62	0.61	17.1	3.97	17.8	1.16	15.7
Local SOEs	0.87	1.08	0.57	4.73	0.65	4.99	0.63	6.65
Total SOEs	**1.59**	**2.7**	**1.18**	**21.8**	**4.62**	**22.8**	**1.8**	**22.3**
Collective	4.39	0.2	0.92	0.09	0.25	0.1	0.31	0.13
Private	27.7	0.61	4.37	0.68	2.11	1.04	2.94	1.45
Private limited	40.3	3.38	9.96	7.56	8.23	7.95	7.96	8.95
Joint stock 1	0.75	0.69	0.54	2.08	0.54	2.52	0.61	3.39
Joint stock 2	4.91	1.33	1.82	2.17	1.87	2.54	1.59	3.09
Total non-SOEs	**78.1**	**6.22**	**17.6**	**12.6**	**13**	**14.1**	**13.4**	**17**
Wholly FIEs	5.85	3.68	3.22	29.9	7.03	25.4	5.01	25.3
Joint venture 1	0.55	0.47	0.35	10.6	2.03	9.38	1.98	11.2
Joint venture 2	0.57	0.27	0.28	1	0.58	1.07	0.53	1.46
Total FIEs	**6.97**	**4.42**	**3.86**	**41.5**	**9.64**	**35.8**	**7.52**	**38**
Total	***86.7***	***13.3***	***22.6***	***75.8***	***27.3***	***72.7***	***22.7***	***77.3***

Source: As for Table 6.1.

Appendix Table 7.3: Average of production factor of major ownerships within transport equipment (excluded automobile) (ISIC 35)

Firm ownership	Fixed capital/employee		Wage per employee		Number of firms	
	2000	2005	2000	2005	2000	2005
Central SOEs	220	146	13.48	17.5	**31**	**45**
Local SOEs	45.1	57.5	11.18	14.5	**37**	**11**
Private limited	27.4	63.6	10.36	11.3	**45**	**196**
Joint-venture	456	232	29.26	27.4	**11**	**10**

Source: As for Table 6.1.

Appendix Table 7.4 Relative competitiveness of different sector and firm ownerships, 2000, 2002 and 2005

Firm ownership	Average value/employee			Average value/wage			Average value/capital		
	2000	2002	2005	2000	2002	2005	2000	2002	2005
Central SOEs	66.5	90.0	135.0	92.0	86.7	103.0	130.0	143.0	89.8
Local SOEs	45.5	60.0	88.0	98.0	75.1	76.7	140.0	142.0	112.0
Central SOCs			129.0			94.0			140.0
Local SOCs			79.0			**63.6**			112.0
Total SOEs	**52.9**	**71.0**	**106.0**	**96.0**	**79.3**	**96.4**	**136.0**	**145.0**	**109.0**
Collective	27.0	21.0	27.0	104.0	57.2	63.5	256.0	201.0	177.0
Private	53.3	76.0	64.0	155.0	177.0	138.0	186.0	228.0	154.0
Private limited	63.8	64.0	56.0	154.0	140.0	105.0	162.0	163.0	123.0
Joint stock 1	60.7	51.0	73.0	92.0	63.5	75.3	171.0	149.0	122.0
Joint stock 2	41.8	56.0	79.0	128.0	113.0	154.0	171.0	143.0	99.1
Total non-SOEs	**48.1**	**65.0**	**57.0**	**143.0**	**145.0**	**110.0**	**199.0**	**193.0**	**134.0**
Wholly FIEs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Joint venture 1	281.0	342.0	456.0	207.0	169.0	199.0	102.0	135.0	122.0
Joint venture 2	144.0	106.0	120.0	129.0	77.7	114.0	96.0	87.0	97.4
Total FIEs	**151.0**	**140.0**	**133.0**	**131.0**	**110.0**	**110.0**	**100.0**	**105.0**	**102.0**

Firm ownership	Average value/total cost			Total factor productivity			Overall		
	2000	2002	2005	2000	2002	2005	2000	2002	2005
Central SOEs	106.0	100.0	100.0	107.0	111.0	104.0	106.0	105.0	102.0
Local SOEs	112.0	101.0	97.0	101.0	101.0	92.1	106.0	101.0	94.8
Central SOCs			121.0			107.0			114.0
Local SOCs			106.0			88.5			97.2
Total SOEs	**110.0**	**101.0**	**100.0**	**103.0**	**105.0**	**98.0**	**106.0**	**103.0**	**99.0**
Collective	97.7	91.0	88.0	97.0	84.7	66.2	97.0	88.0	77.0
Private	79.3	95.0	86.0	99.0	96.7	86.7	89.0	96.0	86.4
Private limited	99.2	96.0	94.0	112.0	103.0	91.0	105.0	99.0	92.7
Joint stock 1	99.1	97.0	94.0	111.0	106.0	98.1	105.0	101.0	96.0
Joint stock 2	106.0	101.0	96.0	108.0	103.0	86.6	107.0	102.0	91.1
Total non-SOEs	**88.7**	**95.0**	**91.0**	**104.0**	**98.6**	**87.9**	**96.0**	**97.0**	**89.6**
Wholly FIEs	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Joint venture 1	106.0	103.0	103.0	111.0	126.0	168.0	109.0	114.0	135.0
Joint venture 2	99.5	99.0	96.0	104.0	101.0	106.0	102.0	100.0	101.0
Total FIEs	**101.0**	**100.0**	**100.0**	**104.0**	**104.0**	**107.0**	**103.0**	**102.0**	**103.0**

Note: Wholly FIEs =100 percent.
Source: As for Table 6.1.

CHAPTER 8
INDUSTRY- AND NATIONAL-LEVEL MANUFACTURING COMPETITIVENESS

8.1 Introduction

For a long time, from the start of the economic renovation in 1986 to the year 2000, studies on Vietnam industrial development were virtually all carried out at an aggregate industry level, e.g. one the combining mining and manufacturing sectors. In addition, due to the immature market economy in Vietnam and its low degree of openness, issues concerning the competitiveness of the whole national economy and of the manufacturing sector were given little attention. Merely since the beginning of 2000, with the economy confronting increased competition and issues arising from international trade liberalization and economic integration, has the international competitiveness of different industries been placed on the research and policy agendas. Nevertheless, studies on industry, including those at the firm-level, have been often based on traditional simple indicators and methods, and have rarely approached the Vietnamese manufacturing sector from a comparative perspective in relation to its regional counterparts.

Given such research limitations, this chapter is aimed at shedding light on the competitiveness of Vietnam manufacturing industries and segments, covering the following issues:

- How did different industries in Vietnam develop and to what extent structural change took place in manufacturing since the start of economic renovation policy in 1986?
- What were the characteristics of underlying competitive factors, fixed assets and labour skills, in Vietnam compared to comparable regional countries or ASEAN-4?

- Which of Vietnam's manufacturing industries or segments had higher, equal or lower competitiveness levels than their counterparts in ASEAN-4 over the period 1998-2005?
- To what extent did differentials in competitiveness drivers affect Vietnam's industry-level relative manufacturing competitiveness?

8.2. The growth and structural changes of manufacturing by industry

8.2.1 The growth trends of different industries

Table 8.1 presents the growth of twenty three industries (two-digit ISIC) with respect to three major indicators – number of firms, fixed capital employed and value-added – over the period 1998-2005. These industries are categorised into three groups. The first is labour-intensive or basic goods (group I), including industries from ISIC 15 to ISIC 19. The second is resource-intensive or intermediate goods (group II), constituting industries from ISIC 20 to ISIC 28. The third is technology-intensive or capital goods (group III), comprising industries from ISIC 29 to ISIC 37. It should be noted that this standard classification is based on the characteristics of the final good produced, and not on the nature of the activity involved in the production of the goods.

There are major noteworthy trends from this table. First, growth rates are very high for all three groups, for all three variables and for virtually all industries in the first sub-period 1998-2000. This is clearly a period in which many enterprises were starting up, including the surge in private firms as analysed in the previous chapter. The data also reflect percentage changes over a low initial base. Over the 2000-05 period the growth in total firm numbers and in fixed capital slowed down, but still remained relatively high (17.2 percent per annum for firm numbers and 15.7 percent per annum for fixed capital) and was fairly widespread across industries. Reflecting the 'start-up' character of the initial years, the growth in value-added was lower over 1998-2000 but was considerably higher than for the other two variables (26.7 percent) over 2000-05, again with rapid growth widely spread across industries.

Table 8.1 Vietnam's growth rate of industries by number of firm, fixed capital and value-added, 1998-2005

Industries	Number of firms (%)			Fixed capital (%)			Value added (%)		
	1998-2000	2000-2005	1998-2005	1998-2000	2000-2005	1998-2005	1998-2000	2000-2005	1998-2005
Food and beverages	90.9	7.0	26.2	208.3	9.8	47.4	35.7	23.7	27.0
Tobacco	23.8	0.9	6.9	311.7	14.3	64.9	14.8	23.5	20.9
Textiles	43.5	19.0	25.6	145.3	20.2	47.4	-2.6	29.6	19.5
Clothing	25.7	23.5	24.1	286.9	19.2	66.9	53.4	16.9	26.3
Leather and footwear	34.3	17.2	21.8	134.2	16.8	42.5	36.6	22.1	26.1
Group I	**68.3**	**11.3**	**25.3**	**182.7**	**14.4**	**48.1**	**30.3**	**23.0**	**25.0**
Wood (excl. furniture)	71.0	17.3	30.6	308.7	26.1	76.4	44.1	31.6	35.0
Paper	41.8	19.6	25.6	162.9	26.8	56.2	19.5	25.6	23.8
Printing and publishing	31.4	36.1	34.8	144.7	23.3	50.0	16.7	17.6	17.4
Petroleum refining	41.4	-3.6	7.6	401.7	-8.0	49.3	41.4	16.6	23.2
Chemicals	31.4	19.6	22.9	156.6	21.1	50.1	25.2	29.6	28.3
Rubber and plastic	33.2	24.1	26.6	97.0	18.6	37.1	27.9	29.8	29.2
Non-metallic minerals	33.6	9.4	15.8	529.1	6.8	77.3	33.9	15.2	20.3
Basic metal	34.5	24.1	27.0	121.8	28.7	50.4	11.5	40.2	31.3
Fabricated metal	51.1	32.7	37.7	186.4	21.0	54.8	39.2	39.8	39.6
Group II	**41.3**	**21.3**	**26.7**	**228.0**	**15.1**	**55.3**	**28.0**	**26.4**	**26.8**
Machinery	22.3	22.0	22.1	170.9	16.5	48.3	4.6	27.9	20.8
Computer manufacturing	15.5	39.3	32.0	38.7	17.8	23.5	43.0	48.3	46.7
Electric machinery	30.1	19.5	22.4	153.4	17.3	46.2	47.1	32.6	36.6
Electronics	9.5	18.8	16.1	268.4	5.6	51.0	11.7	29.0	23.8
Medical and optical	25.6	16.2	18.8	253.3	5.1	48.6	55.6	12.6	23.5
Automobile	33.9	17.1	21.7	431.1	17.8	81.1	70.8	34.7	44.2
Other transport equipment	37.9	15.6	21.6	608.6	23.3	103.2	172.4	40.1	69.4
Furniture	42.5	26.2	30.7	153.3	41.4	67.1	58.4	42.4	46.8
Recyclables	58.1	47.6	50.5	na	86.4	na	103.2	46.6	60.9
Group III	**32.7**	**21.7**	**24.8**	**203.4**	**19.8**	**56.3**	**49.5**	**35.8**	**39.6**
Total	***50.3***	***17.2***	***25.8***	***203.2***	***15.7***	***52.4***	***32.4***	***26.7***	***28.3***

Source: Author's calculations based on UNIDO *Industrial Statistics Database* and Vietnam GSO' published and unpublished annual enterprise surveys.

Second, in terms of growth in firm numbers and capital, the three sectors were very similar over the whole period, except that the number of firms in the labour intensive sector grew very rapidly over 1998-2000, but growth was more subdued over 2000-05. The strong growth in value-added in the high-tech sector, relative to the other two sectors, is notable. This may reflect a low base, but it is sustained in 2000-05 and was widely spread across industries in the sector. In terms of both fixed capital and value-added over 1998-2005, the other transport equipment industry showed the most rapid growth, but the growth in fixed capital was also very high in automobiles, non-metallic minerals, wood, clothing and tobacco.

More detailed analysis, not reported here, shows that it should be noted, as is shown in Appendix Table 8.1, the impressive growth of most industries did not necessarily reflect equally rapid growth in all three-digit industries within the two-digit industry. The most typical case in 1998-2000 was transport equipment within which ship building (ISIC 351) reached very high fixed capital and value-added growth of 481 and 94 percent per annum, but aircraft (ISIC 352) experienced a negative growth rate of 12 and 9 percent by corresponding indicators. Railway (ISIC 352) was also the sixth slowest with regard to value-added growth. Similarly, electric machinery and electrical equipment (ISIC 319) recorded the highest of all fifty five three-digit industries with an annual growth rate of 6508 percent and 339 percent, which was a "rocket" in terms of fixed capital and very high by value-added in the 1998-2000 sub-period. Nonetheless, electricity distribution and control apparatus (ISIC 312) had a negative value added growth rate and accumulators (ISIC 314) during a similar period. Two other sub-industries including accumulators and battery, light equipment showed the second and fourth lowest growth rate during the seven-year period of 1998-2005.

Table 8.2 presents information concerning structural changes in each industry's role, measured here as the share of that industry in total gross output value at different time periods. Because of the need for a longer time period we here revert to official Vietnamese data. A number of striking patterns should be noted from those data. First, there has been considerable structural change by industry in manufacturing in Vietnam, mostly characterised by the steady rise of the high-tech group's share in total output, rising by over 15 percentage points, from 9.7 percent in 1986 to 25 percent by 2005. By contrast, the proportion of the labour-intensive group remained slightly above 50 percent over the first five years of 1986-1991, but fell by nearly ten percentage points during the next fourteen years of 1991-2005. The transformation in industrial structure was not as large as in the case of ownership structure (see Chapter 7), mostly due to the opposing trends in the role of the resource-intensive group between two sub-periods, with a steady decline during the post-reform first 14 years, 1986 to 2000, and an increase from 2000 onwards. As a result, the share of this group only decreased by around 6.5 percentage points between 1986 and 2005.

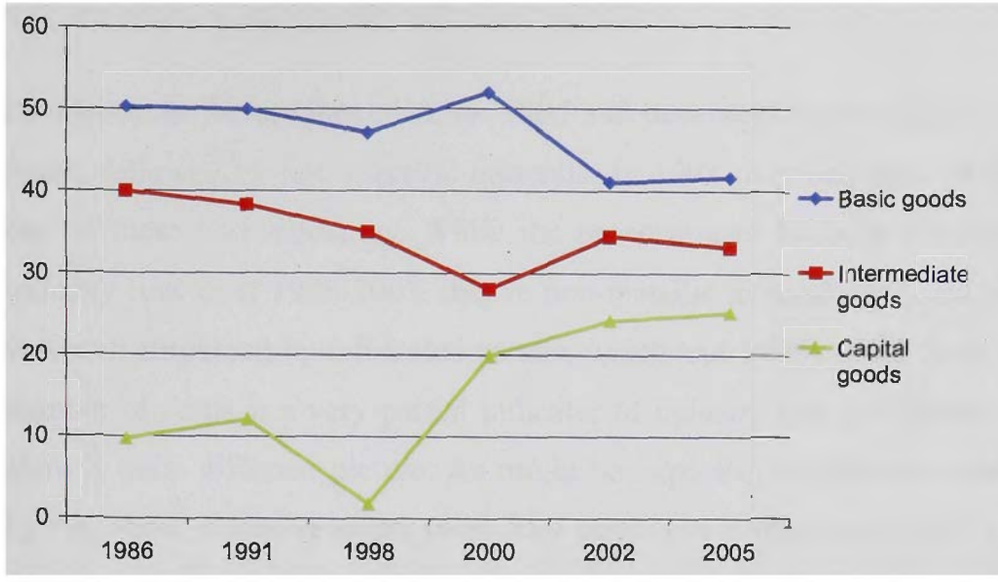
Table 8.2 Structural roles of industries in Vietnam manufacturing by gross output, at current prices, 1986-2005

Industries		Share in output (%)					
		1986	1991	1998	2000	2002	2005
Food and beverages	15	29.0	29.8	24.5	32.0	24.9	24.8
Tobacco	16	3.0	2.8	4.1	3.0	2.8	2.9
Textiles	17	14.6	12.5	7.3	5.0	4.2	4.8
Clothes	18	2.5	3.5	4.1	5.6	4.1	4.2
Leather and footwear	19	1.3	1.4	7.0	6.5	5.4	5.0
Group 1		**50.3**	**50.0**	**47.1**	**52.0**	**41.4**	**41.7**
Wood (excl. furniture)	20	10.6	5.9	1.1	1.4	2.0	1.7
Paper	21	3.9	3.8	2.9	2.2	2.4	2.5
Printing and publishing	22	0.4	0.7	2.5	1.8	1.8	1.6
Coke & petroleum				0.6	0.4	0.3	0.3
Chemicals	24+25	9.2	11.7	8.5	6.8	7.1	7.0
Rubber and plastic				3.8	3.6	5.2	4.5
Non-metallic minerals	26	8.9	9.5	7.9	6.3	8.3	6.2
Basic metal	27	1.9	2.1	5.0	2.9	3.9	4.6
Fabricated metal	28	5.1	4.7	2.7	2.7	3.5	4.8
Group 2		**40.0**	**38.3**	**35.0**	**28.1**	**34.5**	**33.2**
Machinery	29	7.2	8.5	2.2	1.9	2.8	1.9
Computer manufacturing	30	0.0		4.0	3.5		1.9
Electric machinery	31			2.7	2.8	4.0	4.3
Electronics	32	1.6	2.5	4.6	3.0	3.0	2.6
Medical and optical	33			0.4	0.5	0.4	0.3
Automobile manufacturing	34			1.5	2.2	4.3	4.3
Other transport	35			0.8	4.3	6.2	6.0
Furniture	31+33+ +34+35	1.0	1.2		1.9	3.5	4.0
Recyclables					0.01	0.01	0.02
Group 3		**9.7**	**12.1**	**1.8**	**19.9**	**24.2**	**25.2**

Source: Author calculations based on Vietnam GSO *Vietnam Statistical Data in the 20th Century* and GSO annual enterprise surveys.

Across industries, food and beverages remained as the largest two-digit industry in terms of gross output, despite its falling share from 2000, and it still accounted for one quarter of gross output in 2005. Such a persistently significant role for this industry can be explained by two reasons. For one thing, food and beverages made up a very high proportion of output before the economic reform starting in 1986. For another, as seen in Table 8.1, of the twenty three industries, this industry had a high annual average growth rate in terms of firm numbers and fixed capital, especially in the initial years of 1998-2000.

Figure 8.1 Share of the three major industry groups in Vietnamese manufacturing by gross output (%), at current prices, 1986-2005



Source: Based on Table 8.1.

In 1986 the second largest industry was textiles, followed by wood, chemicals and non-metallic minerals. After 1991 textiles was displaced from this position by both chemicals and non-metallic minerals which, together with food and beverage, formed the top three largest industries through to 2005. This was despite a 7 percent in their share in total output within the seven years of 1998-2005, as the structure of Vietnamese manufacturing became more diversified.

Secondly, the industry upgrading its structural role most rapidly was transport equipment (excluding automobiles), with its output share jumping from 0.8 percent in 1998 to 6.0 percent in 2005. By 2005, this industry had nearly caught up with non-metallic minerals, producing 6.0 percent as opposed to 6.2 percent of total output respectively. Other industries whose share of output rose rapidly included leather and footwear, automobiles, basic metals and electric machinery. By contrast, textiles and wood were the two industries whose output shares reduced most during 1986-2005, falling by 9.7 and 8.9 percentage points respectively over the period 1986-1998.

Structural change in manufacturing and the role of different industries during 1998-2005 can be highlighted more adequately by examining data on the number of firms, employees, fixed capital and value-added as the most substantial indicators. These data

are provided in Table 8.3, where again the percentage change calculations are based on data in US dollars, other than for firm numbers.

In relation to the number of firms, food and beverages had the largest number in both years, followed by non-metallic minerals. In 1998 over one-third of all firms were in one of these two industries. While the proportion of firms in the food and beverage industry rose over 1998-2005, that in non-metallic minerals fell, and by 2008 its share was well surpassed by fabricated metals, which had 10.8% of all firms in 2005. But the number of firms is a very partial indicator of industry size, and shares by employment show a quite different picture. As might be expected, employment remains dominated by the labour-intensive sector (with 55.4 percent of employees in 2005). The leather and footwear industry remained the largest employer in 2005, accounting for over 18 percent of employees, followed clothing (16.8 percent) and food and beverages (14.0 percent). With tobacco being a very small employer, four of five industries in the labour-intensive group still employed 55 percent total manufacturing labourers until 2005, despite a 4.5 percentage point reduction in the textile share. Over the period the employment share of high-tech industries increased by four percentage points, while that of intermediate goods remained nearly unchanged.

With regard to fixed capital, the position of being the largest group shifted from the basic-goods to intermediate-goods in 1998-2005. The capital-goods, high-tech group however still made the lowest contribution in both years. The share of total fixed capital employed in the food and beverages industry was still the largest of any two-digit industry in both 1998 and 2005. Fixed capital employed in the non-metallic minerals industry rose sharply over the 1998-2005 period, to be the second biggest industry in 2005, with 14.7 percent of total fixed capital.

With respect to value-added, arguably the most important indicator, the labour-intensive group still held the largest share in 2005, followed by the resource-intensive group, despite the reduction of 9 percentage points for the former and of 2 percentage points for the latter within 1998-2005. In contrast, the share of the tech-intensive group rose considerably, by over 11 percentage points over this seven-year period, but was still the lowest of these three sectors, accounting for just over 25 percent of total manufacturing value-added by 2005.

Table 8.3 Structural roles of different industries within Vietnam manufacturing sector by number of firms, employee, fixed assets and value-added, 1998 and 2005

Industries	Firm numbers		Employees		Fixed asset		Value added	
	Share of total (%)							
	1998	2005	1998	2005	1998	2005	1998	2005
Food and beverages	20.9	21.4	12.2	14.0	20.5	16.3	23.8	22.2
Tobacco	0.3	0.1	1.1	0.5	0.4	0.6	6.9	4.6
Textiles	4.5	4.4	10.6	6.1	12.4	9.8	8.4	5.1
Clothing	7.9	7.2	15.6	16.8	2.4	4.6	6.5	5.8
Leather and footwear	3.1	2.5	19.2	18.1	10.6	6.6	7.3	6.4
Group I	**36.8**	**35.6**	**58.6**	**55.4**	**46.3**	**37.9**	**52.9**	**44.0**
Wood (excl. furniture)	5.4	7.1	2.5	3.6	0.6	1.7	1.1	1.6
Paper	4.2	4.2	2.7	2.3	2.9	3.5	2.2	1.7
Printing and publishing	3.3	5.4	1.8	1.4	1.6	1.5	2.8	1.5
Petroleum refining	0.13	0.04	0.05	0.04	0.17	0.15	0.36	0.27
Chemicals	5.1	4.3	4.0	2.6	6.3	5.7	7.0	7.0
Rubber and plastic	5.8	6.0	3.5	3.7	10.6	5.1	3.7	3.9
Non-metallic minerals	13.4	7.5	7.1	7.0	5.1	14.7	10.3	6.6
Basic metal	1.6	1.7	2.9	1.4	4.0	3.7	3.1	3.6
Fabricated metal	5.7	10.8	2.3	4.0	4.3	4.7	2.4	4.3
Group II	**44.7**	**47.0**	**26.7**	**26.1**	**35.6**	**40.6**	**32.9**	**30.4**
Machinery	3.5	2.8	2.8	1.7	2.4	2.0	2.4	1.6
Computer manufacturing	0.1	0.1	0.3	0.4	4.8	1.1	0.7	1.9
Electric machinery	2.2	1.8	2.4	2.7	4.5	3.4	2.7	4.1
Electronics	1.5	0.9	1.5	1.2	2.1	1.9	3.5	2.8
Medical and optical	0.6	0.4	0.4	0.4	0.6	0.5	0.4	0.3
Automobile manufacturing	2.0	1.6	1.0	1.2	0.8	2.8	1.8	4.1
Other transport equipment	2.9	2.3	2.3	2.8	0.8	5.7	0.9	6.5
Furniture	5.7	7.4	4.0	8.2	2.2	4.2	1.7	4.4
Recyclables	0.04	0.15	0.01	0.04	0.00	0.03	0.00	0.01
Group III	**18.5**	**17.4**	**14.6**	**18.5**	**18.0**	**21.5**	**14.2**	**25.6**
Total	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***

Source: As for Table 8.1.

Among industries, food and beverage was also the largest in spite of declined value-added share in total, from one-fourth by 1998 to one-fifth by 2005. This industry's top position, as indicated in the Appendix Table 8.2, as attributed evenly to four of its five segments which formed the top ten largest of total fifty-five three-digit industries. Non-metallic minerals and chemicals respectively came in as the second and third largest industries in the three years of 1998, 2000 and 2002; and in 2005, it contributed around 10 and 7 percent of total value-added.

The fastest growing industry, as measured by changes in value-added share, was the transport equipment industry (excluding automobiles), increasing the greatest value-added share in total of nearly 6 percentage points during 1998-2005. However, as noted earlier, the growth rates of three-digit components of this industry have been very diverse, with shipbuilding (ISIC 351) and motorcycle production (ISIC 359) growing rapidly, but railway equipment (ISIC 352) and aircraft production (ISIC 359) remaining subdued. By contrast, the industries experiencing the biggest declines in value-added share were non-metallic minerals and textiles, both with falls of 3-4 percentage points. The case of non-metallic minerals is particularly interesting, as it experienced both the biggest rise in fixed capital share and the largest fall in value-added share, implying a sharp rise in capital per unit of value-added, a rise of around 9 percent. This could reflect either low efficiency of exploiting fixed capital or a sharp change in the nature of production to more capital intensive methods (or both).

8.2.2 Comparative structural changes in the context of ASEAN-4

This analysis shows that, since the transition of the economy had started in 1986, the industrial composition of manufacturing in Vietnam had made certain progress, with a significant shift from an industrial structure dominated by basic-goods, labour-intensive industries toward more capital-goods and technology-intensive industries, especially since 2000. In this section we place this finding in the context of the ASEAN-4 countries, analysing data for selected years on industry share of value-added for the ASEAN-4 and Vietnam (see Table 8.4). The availability of data varies across countries, and two years of data are provided for each country.

In 1998 the share of the capital-goods, high-tech group in total manufacturing value-added in Vietnam was much lower than in any of the ASEAN-4, but it had nearly approached that of Indonesia by the same year 2005, with the disparity between two countries in this share being reduced by 5 percentage points. However, with respect to structural change towards the level of the industrialized economies as compared to all reasonably comparable countries or to the ASEAN-4, Vietnam's manufacturing structure remained less advanced. On the one hand it is still most concentrated on the labour-intensive industries. On the other hand, the share of the technology-intensive group in total value-added by 2005 was still lower than that of the Philippines and

Thailand in 1998. Of all the regions' countries including ASEAN and China, in addition to Singapore, Malaysia is widely regarded as being an industrialized economy since the economy meets two critical indicators of this stage of industrial development, as indicated in Chapter 2. In comparison, Vietnam's value added share for the basic-goods group was 3.5 times greater in 2005 than that of Malaysia, with its high-tech share a little more than one half, at 25.6 percent in 2005 against 42.7 percent in Malaysia in 2003.

With the exception of Malaysia, which had several industries with a larger share than food and beverages, in particular electronics providing nearly 20% of value-added in 2003, in each of the other countries food and beverages remained the largest industry in the latest year for which data are available. In two of these four countries (the Philippines and Thailand), the food and beverage share fell significantly over the period. Another feature of the Vietnamese case was the diversification of value-added outside of food and beverages: in 2005 Vietnam had six industries in which the value-added share was the highest for the five countries (two in each group) while the second highest value added share was only 7.0 percent (chemicals). This contrasts strongly with Indonesia and the Philippines, which had three additional industries with a share of over 10 percent, but shows some similarities to the relatively even distribution of industries in Thailand.

The five industries, other than food and beverages, in which Vietnam had a higher share of manufacturing value than any of the ASEAN-4 were clothing (5.8 percent of value-added in 2005), leather and footwear (6.4 percent), non-metallic minerals (6.6 percent), basic metals (3.6 percent), other transport equipment (6.5 percent) and furniture (4.4 percent). For capital-goods, other transport equipment has been described as a new emerging industry in the region since its size in terms of value-added became larger than that of Thailand and the Philippines, but remained a half of that of Malaysia and just 14 percent of that of Indonesia by 2003.

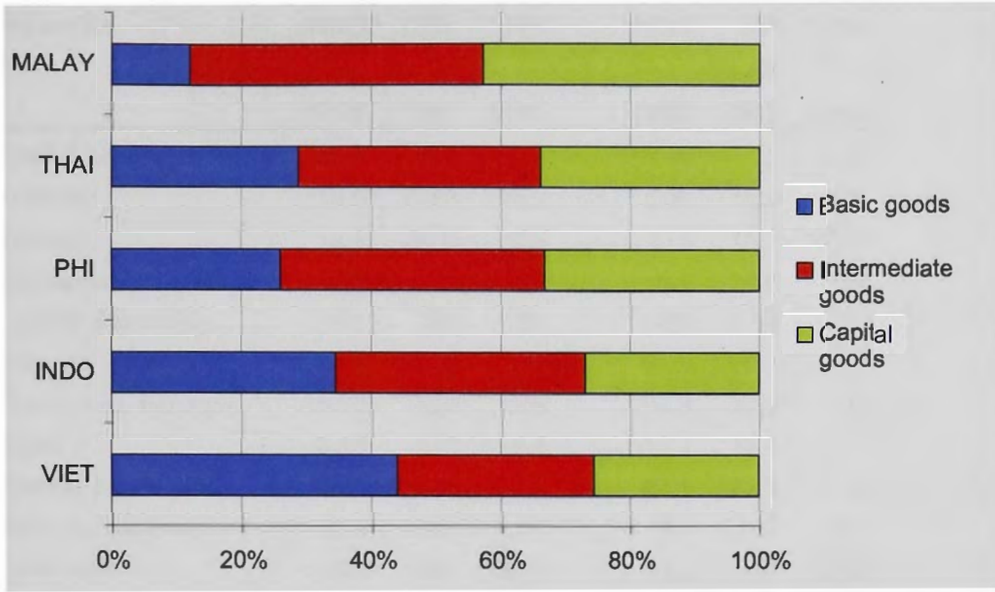
Table 8.4 Value-added manufacturing structure by industry of Vietnam and ASEAN-4 (%), 1998-2005

Industries	VIET 1998	INDO 1998	PHI 1998	THAI 1998	MALAY 2000	VIET 2005	INDO 2005	PHI 2003	THAI 2000	MALAY 2003
Food & beverage	23.8	13.0	22.4	24.9	7.7	22.2	13.6	16.8	12.8	8.4
Tobacco	6.9	9.2	3.8	0.1	0.3	4.6	10.4	2.5	4.1	0.3
Textiles	8.4	10.9	2.0	6.9	2.3	5.1	6.1	1.8	7.3	1.6
Clothes	6.5	3.6	4.8	3.3	1.6	5.8	2.6	4.0	2.7	1.6
Leather &footwear	7.3	3.8	0.9	2.2	0.2	6.4	1.8	0.9	1.9	0.2
Group I	**52.9**	**40.4**	**33.9**	**37.4**	**12.1**	**44.0**	**34.5**	**26.0**	**28.8**	**12.0**
Wood (excl furniture)	1.1	7.0	0.8	0.9	3.9	1.6	4.3	0.6	1.1	3.4
Paper	2.2	3.6	2.0	1.8	2.0	1.7	6.3	1.9	2.8	2.0
Printing & publishing	2.8	2.8	1.8	1.3	2.0	1.5	1.4	1.0	1.7	2.0
Petroleum refining	0.4	0.2	9.0	0.0	8.9	0.3	0.2	15.5	3.3	9.1
Chemical	7.0	14.0	11.0	4.4	7.9	7.0	10.2	10.3	5.9	9.2
Rubber & plastic	3.7	4.0	2.3	6.8	7.1	3.9	5.9	2.6	5.8	8.0
Non-metallic mineral	10.3	0.0	4.4	8.7	4.7	6.6	4.7	3.8	6.1	5.0
Basic metal	3.1	4.1	3.6	1.6	2.8	3.6	2.8	3.1	2.2	3.4
Fabricated metal	2.4	2.7	1.6	3.3	3.2	4.3	2.6	1.9	8.3	3.2
Group II	**32.9**	**38.5**	**36.6**	**28.7**	**42.5**	**30.4**	**38.5**	**40.7**	**37.3**	**45.2**
Machinery	2.4	1.3	1.6	5.4	3.4	1.6	2.2	3.2	3.6	3.2
Computer	0.7	0.0	2.9	3.2	5.3	1.9	0.0	4.0	5.3	5.5
Electric machinery	2.7	1.5	3.1	2.9	3.6	4.1	2.2	2.8	4.9	3.2
Electronics	3.5	5.0	15.3	6.6	25.2	2.8	4.9	14.4	9.1	19.6
Medical & optical	0.4	0.4	1.1	0.6	1.2	0.3	0.1	1.7	0.7	1.1
Automobile	1.8	1.4	1.9	11.2	2.7	4.1	12.2	4.4	6.3	5.6
Other transport equip.	0.9	7.1	1.7	0.0	1.2	6.5	3.6	1.3	0.5	1.7
Furniture	1.7	4.2	1.8	3.9	2.9	4.4	2.0	1.5	3.5	2.8
Recyclables	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Group III	**14.2**	**21.1**	**29.5**	**33.9**	**45.5**	**25.6**	**27.0**	**33.3**	**33.9**	**42.7**
Total	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***	***100***

Source: As for Table 8.1.

While comparisons of the absolute size of industries must be treated carefully, because of differences in years and in size and development levels of countries, it is notable that Vietnamese manufacturing had no industry outside the basic-goods industries in which it was the largest (in terms of value-added) compared to the ASEAN-4, while each of these countries had several industries in which they were the largest in the region. For the basic-goods industry, only leather and footwear (ISIC 19) was larger than in the four ASEAN-4 and also ranks eighth in top ten largest among developing countries in 2004 (UNIDO 2006).

Figure 8.2 Value-added manufacturing structure by three major group industries, Vietnam, 2005 and ASEAN-4: Indonesia 2005, Thailand 2000, Philippines 2003 and Malaysia 2003, 1998-2005 (group share of total, %)



Source: As for Table 8.2.

8.3 Competitiveness driver differentials

In Section 8.4, the relative competitiveness of industries in the five countries will be analysed, using a range of indicators. Here, as a precursor to that discussion, the position of industries in Vietnam relative to those in the ASEAN-4 on these potential drivers of differences in competitiveness – capital intensity (fixed capital per employee), labour costs and firm size – will be examined. For this analysis Tables 8.5 to 8.7 present indices of Vietnam's relative position for these indicators, for selected years for which data are available. For each industry, country and year, these indices present Vietnam's level relative to the foreign country level set equal to 100. Thus a value of 50 for Indonesia means that, for that industry in that year, the value of the indicator for Vietnam was half that of its value for Indonesia.

8.3.1 Capital intensity

As is suggested by the regression results of the impact of competitiveness drivers on the firm in Vietnam in Chapter 7, cross-industry relative capital intensity ratios, displayed in Table 8.5, will play a significant part in explaining the findings of Section 8.4 concerning Vietnam's relative competitiveness to ASEAN-4.

Table 8.5 Vietnam cross-industry capital intensity (fixed capital per employee) relative to ASEAN-4 (foreign country = 100 for each year and industry), selected years, 1998-2003

Industries	INDO	THAI	PHI	INDO	MALAY	PHI
	1998	1998	1998	2002	2002	2003
Food & beverage	52.5	199	141	116	22	249
Tobacco	19.5	5123	23.3	236	18.6	308
Textiles	18.8	88.5	405	119	18.3	1539
Garments	32	21	120	9.4	34.6	764
Leather & footwear	71.1	298	333	165	22	1173
Group I	**25.4**	**90.5**	**152**	**51.1**	**16.1**	**370**
Wood (excl. furniture)	4.53	153	12.8	69.6	10.3	599
Paper	8.43	249	42.1	16.2	12.4	431
Printing & publishing	8.72	741	77.8	83.1	23.1	1210
Petroleum refining	13.4	5.47	4	759	6.32	807
Chemicals	17.9	59.7	67.1	31.3	4.88	342
Rubber & plastic	68	123	161	201	43.1	1137
Non-metallic minerals		41.6	24.7		20.6	170
Basic metal	4.16	15.8	153	18.9	15.6	569
Fabricated metal	58.3	546	281	18.2	28.9	381
Group II	**16.8**	**66**	**53.3**	**57.3**	**18**	**400**
Machinery	17.2	22.6	20.9	26.5	27.2	417
Computer	410	577	351			
Electric machinery	39.7	160	109	51.6	30.9	434
Electronics	14.1	44.2	45.8	358	47.8	413
Medical & optical	53	42.2	81.5	1931	67.9	636
Automobile	13.8	11.9	47.5	151	48.3	262
Other transport equipment	7.08	25.5	9.96	202	51.3	180
Furniture	65.5	186	82.6	91.5	24.6	568
Recyclables		0		212	33.7	
Group III	**31.2**	**45.4**	**48.9**	**85.7**	**27.5**	**252**
Total	***21***	***60***	***56.1***	***56***	***16.4***	***275***

Source: As for Table 8.1.

It is apparent from Table 8.5 that Vietnam was generally disadvantaged in terms of fixed assets per employee compared to ASEAN-4 (that is, an index value of less than 100), particularly in relation to Malaysia. In 1998, Vietnam's fixed capital/employee ratios were lower than those of Indonesia and the Philippines for all three groups except the labour-intensive industries for the Philippines. In 2002, the ratios for all three groups were still markedly below those of Indonesia and Malaysia, but by 2003 they had become significantly higher than the Philippines. It is also clear that the degree of capital intensity disadvantage varied between groups and across comparator countries. It

is notable that the capital-intensive group was the least capital disadvantaged compared to Indonesia and Malaysia, and that the labour-intensive group was the most disadvantaged. This implies that, relative to these regional countries, the labour-intensive industries in Vietnam still relied much more on low labour cost rather than embodied technology. The differences between Vietnam and Malaysia in 2002 are particularly striking, with overall capital per employee in Vietnam only one-sixth of that in Malaysia, with the ratio above 50 in two industries.

Although overall manufacturing capital per employee in Vietnam in 2002 was little more than half of that in Indonesia, a half of all industries had a higher ratio than their counterpart in Indonesia. The group of industries which were least capital intensive consisted of garments, paper and basic and fabricated metals, where in each case capital per employee was less than 20 percent of that in Indonesia. The corresponding group for Malaysia was chemicals, oil refining and wood.

The second feature of the fixed capital per employee data is that there was some evidence of a tendency for convergence of Vietnam to some ASEAN-4 countries within 1998-2003, although the limited data makes any full analysis impossible. The clearest case is that of the Philippines, where Vietnam's relative fixed capital intensity even dramatically reversed for virtually all industries over the five years 1998-2003 as the result of the rapid growth in fixed capital in Vietnam (52.4 percent over 1998-2005) (see Table 8.1).

8.3.2 Labour cost differences

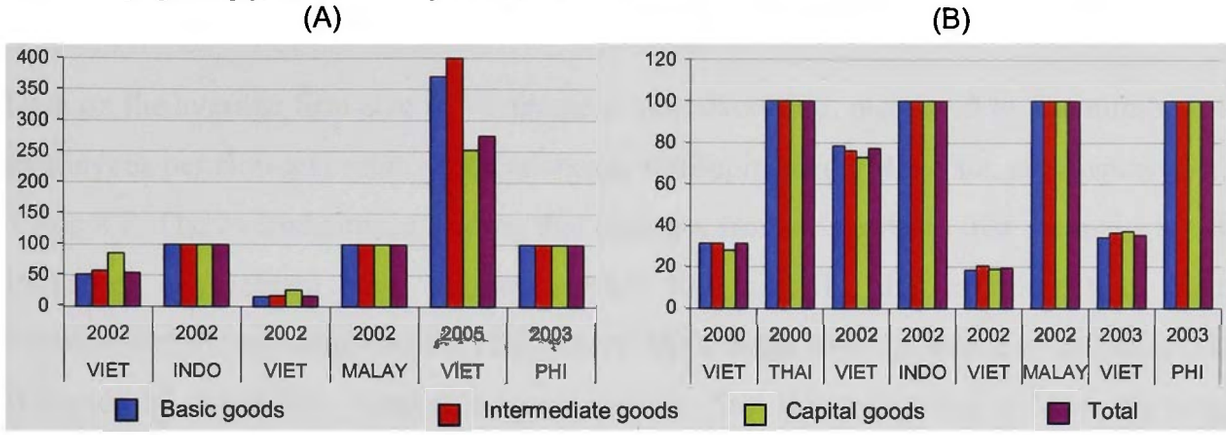
Based on the figures provided in Table 8.6, two striking features of Vietnamese across-industry labour costs relative to ASEAN-4 can be seen. First, except for Indonesia in the crisis year 1998, wages per employee in Vietnamese manufacturing as a whole, and also for every group, were lower than for the countries of ASEAN-4. With the further exception of Indonesia in 2002, this was true also for virtually all industries, with Vietnamese industries having lower labour cost levels than their counterparts in ASEAN-4. As for fixed assets, Vietnamese wages per employee was slightly lower than Indonesia in 2002 and much lower than in Malaysia – in 2002 wages per employee in Vietnam were only 27 percent of those in Malaysia. Nonetheless, and contrary to the

case of fixed assets per employee, Vietnam's average labour costs only represented 30-40 percent of those in Thailand and Philippines in all comparative years.

Second, whereas Vietnam's wage level per employee in manufacturing increased at the modest rate of 1.9 percent per annum over 1998-2005 with growth at a comparable rate in all three groups and most industries, the evidence in Table 8.5 suggests that Vietnam's wage levels fell relative to comparable countries between 1998 and 2003. More concretely, in 2000, Vietnam's labour cost levels were about 90 percent those of Indonesia for the resource and capital-intensive groups and even nearly 100 percent for the labour-intensive group. Indeed, eight of twenty-two industries in Vietnam, distributed evenly across the three groups, and paid higher wage rates than Indonesia. But by 2002 Vietnamese wage levels, in all three groups and for the total, had fallen significantly relative to those of Indonesia, by an average of more than 15 percent. Similar falls are evident relative to the Philippines over 1998-2003, and a smaller fall is evident for Malaysia over 2000-2002. In other words, Vietnam's wage growth rate was slower than these ASEAN countries over that period, and Vietnam's relative labour costs fell further.

In the traditional theoretical view, a low unit labour cost would be regarded as the main significant competitive advantage of Vietnam as compared to advanced countries or to other more industrialized countries in ASEAN. Nonetheless, Porter (1998) indicated that low labour costs do not automatically provide a competitive advantage, and that certain conditions need to be met for this to be so. On the demand side, lower labour costs will turn out to be a competitive advantage if such lower wages per employee leads to a sufficiently high level of demand, and hence to the amount of value-added which at least equals that produced by other competitors hiring labour at a higher unit cost. Low labour costs need to be allied to scale of production, and to demand in the domestic and foreign markets.

Figure 8.3 Vietnam cross-industry capital intensity (A) and labor cost (B) relative to ASEAN-4 (foreign country = 100 for each year and each industry group), selected years, 1998-2003



Source: Based on Tables 8.5 and 8.6.

Table 8.6 Vietnamese labour cost (wages per employee) by industry relative to ASEAN-4 (foreign country = 100 for each industry and country), selected years, 1998-2003

Industries	INDO 1998	PHI 1998	THAI 1998	INDO 2000	THAI 2000	MALAY 2000	INDO 2002	MALAY 2002	PHI 2003
Food & beverage	221	37.1	54.4	95.8	33.3	18	101	18.4	26.5
Tobacco	260	83.1	179	276	33.5	62.3	167	45.7	67.4
Textiles	193	42.9	35.3	108	31.3	17.9	83.2	19.1	36.9
Clothes	210	49.4	45.7	97	33	23.1	68.8	19.4	41.2
Leather & footwear	141	64.6	48.2	78.7	30.7	20.3	64	18.6	48.2
Group I	**188**	**44.3**	**45.5**	**98.1**	**31.3**	**18.8**	**78.6**	**18.3**	**34.3**
Wood (excl. furniture)	131	46.7	38.1	75.7	30.7	20.9	64.3	22.7	49.1
Paper	192	33.5	30.2	83.7	26.4	18.9	72.1	17	33.3
Printing & publishing	38.6	43.1	46.8	153	35.8	22.9	76.4	20.8	51.5
Petroleum refining	453	32.7	168	196	50.4	32.2	828	29.4	25.5
Chemicals	152	35.2	39.4	69.6	33.4	17.6	75	17.9	31.3
Rubber & plastic	196	46.8	49	119	39.6	27.3	88.4	23.9	50.4
Non-metallic minerals		40.7	31		30.3	18.3		17.8	30.9
Basic metal	60.5	35.7	27.4	53.7	30.1	20.4	48.1	19.1	50.9
Fabricated metal	203	67.5	55.5	78.1	28.6	19.6	72.6	18.7	43.6
Group II	**140**	**38.9**	**40.4**	**87.3**	**31.4**	**21.8**	**76.1**	**20.5**	**36.6**
Machinery	122	43.8	28.9	55.2	20.7	12.6	56.9	16.7	48.2
Computer	151	45.8	38.9	141	28.9	26.7			
Electric machinery	162	52.6	49.2	88.6	33	25.9	56.9	24	48.8
Electronics	174	54.9	46.2	94	39.9	25.9	84.6	26	48.3
Medical & optical	221	70.3	49.1	115	39.5	22.8	113	21.3	49.9
Automobile	130	46.4	36.2	53.4	21.9	20.1	63.8	22.8	35.3
Other transport equipment	99.6	27.5	285	93.6	35.7	14.7	99.8	13.6	25.3
Furniture	93.7	46.8	38.6	115	36.7	22.1	89.8	21	41.6
Recyclables	230	36.9	64.9	45.3	7.1	3.8	52.8	5.7	29.5
Group III	**125**	**42.7**	**36.7**	**87.6**	**28.1**	**19.2**	**73**	**18.8**	**37.3**
Total	***154***	***40.6***	***39.7***	***90.9***	***28.7***	***28.1***	***75.5***	***26.9***	***33.6***

Source: As for Table 8.1.

8.3.3 Firm size differences

Data on the average firm size in Vietnamese manufacturing, measured by the number of employees per firm and relative to Indonesia, Philippines and Malaysia, are displayed in Table 8.7. The overwhelming finding that emerges from this table is that the majority of industries in Vietnam have smaller average firm size, by this criterion, than their counterparts in Indonesia and the Philippines, but a larger average size than in Malaysia. It should be noted that Vietnam's larger average firm size compared to Malaysia may reflect its smaller total population and labour force, which is approximately 40 percent of that in Vietnam, but it also reflects the measure used. The results on relative firm size for these two countries are reversed if a different measure (fixed assets per firm) is used: on this basis only three of the twenty-two industries in Vietnam had higher average firm size than in Malaysia.

Of the three groups, Vietnam's basic-goods or labour-intensive group demonstrated an average firm size larger than in all three countries, while the intermediate-goods group had the smallest mean firm size relative to Indonesia and Malaysia in all three years. Similarly, the average firm size within virtually all industries in Vietnam's labour-intensive group were strikingly greater than in the Philippines and Malaysia. Within the high-tech group, the small size of firms in the electronics industry in Vietnam was notable, being significantly lower than that within three comparative countries in all three years, even compared to Malaysia.

Table 8.7 Vietnam cross-industry firm size (employees per firm) relative to ASEAN-4 (foreign country = 100 for each industry and year), 1998-2003

Industries	INDO 1998	PHI 1998	INDO 2000	MALAY 2000	INDO 2002	MALAY 2002	PHI 2003
Food & beverage	87.6	85.2	60.2	192	70.3	227	53.4
Tobacco	207	173	177	1293	150	1064	71.4
Textiles	165	508	88.8	345	86.3	308	211
Clothes	195	495	177	1372	162	1290	186
Leather & footwear	253	1699	242	3583	246	4561	857
Group I	**149**	**338**	**87.7**	**502**	**101**	**583**	**127**
Wood (excl. furniture)	38.7	219	37.1	86	33	91	65.8
Paper	41.4	175	36.3	104	27.9	98.5	67
Printing & publishing	108	345	76.2	213	55.3	120	88.3
Petroleum refining	78.1	50.8	115	64.3	156	77.6	63.5
Chemicals	68.3	213	77.7	194	54.1	147	88.7
Rubber & plastic	58.3	176	51	104	41.6	95.9	87.9
Non-metallic minerals		171		175		208	118
Basic metal	148	485	79.9	293	53.5	197	142
Fabricated metal	61.6	191	57.4	250	44.6	198	55.3
Group II	**58**	**216**	**53.8**	**154**	**44.9**	**139**	**87.6**
Machinery	117	372	98.6	292	44.1	249	105
Computer	1200	106	1016	71.8			
Electric machinery	92.8	99.3	79.9	130	61.1	111	48.4
Electronics	35.1	34.3	26.9	25.5	33.5	27.1	25.4
Medical & optical	54.3	27.5	45.9	34.1	105	38.4	44.8
Automobile	57.2	115	37.3	65	46.2	66.9	61.6
Other transport equipment	70.8	167	62.1	133	97.9	136	106
Furniture	88.6	246	87.4	277	99.2	303	151
Recyclables	49.9	66.6	135	230	48.4	97.1	17.7
Group III	**82**	**122**	**69.9**	**94.2**	**73.9**	**102**	**53.6**
Total	***96.2***	***235***	***72.2***	***196***	***72.2***	***208***	***91***

Source: As for Table 8.1.

8.4 Competitiveness performance indices

In this section we analyse trends within Vietnam, and also trends relative to the ASEAN-4 on five competitiveness performance indicators used in two previous chapters. TFP estimations are also based on equation (2). Again these tables are based on the UNIDO data, and hence calculated from series, other than employment, measured in current price US dollars.

8.4.1 Competitiveness performance growth rates: Vietnam

Table 8.8 displays the average annual growth rates of competitiveness by industry for Vietnam over the 1998-2005 period, measured by three indicators: labour productivity, wage competitiveness and cost competitiveness.

Table 8.8 Cross-industry average annual growth rates of labour productivity (1), wage competitiveness (2) and cost efficiency (3), 1998-2005

Industries	Annual growth rate (%)			Industries	Annual growth rate (%)		
	1	2	3		1	2	3
Food & beverage	4.7	3.9	-0.12	Basic metal	22.6	15.2	5.89
Tobacco	13.5	4.1	0.24	Fabricated metal	8.6	10.6	2.58
Textiles	8.7	6	0.27	**Group II**	**7.1**	**4.7**	**1**
Clothes	5.1	3.4	0.08	Machinery	9.3	2.9	-3.3
Leather & footwear	7	7.6	6.65	Computer	19.8	21.5	34
Group I	**6**	**4.9**	**0.1**	Electric machinery	13.3	12	1.89
Wood (excl. furniture)	7.5	3.8	1.44	Electronics	7.6	6.5	7.81
Paper	6.4	3.5	-0.35	Medical & optical	3.4	5	-1.2
Printing & publishing	3	-0.2	-1.63	Automobile	17.8	14.4	-2.8
Petroleum refining	9.1	7.8	7.85	Other transport equipment	38.7	25.8	3.75
Chemicals	14.6	8.4	5.38	Furniture	11.3	7.2	5.18
Rubber & plastic	7.5	6.2	-0.68	Recyclables	1.3	-0.7	-13
Non-metallic minerals	1.2	-1.8	-2.88	**Group III**	**13.6**	**10.2**	**6.4**
				Total	***7.9***	***6***	***1.1***

Source: As for Table 8.1.

Comparing the three groups, the capital-goods, high-tech group showed the most rapid growth for all three indicators, followed by the intermediate-goods group and with the basic-goods group last. There was rapid growth in both labour productivity and wage competitiveness, especially in the high-tech group (14.9 percent and 12.5 percent for the two indicators respectively), but also for manufacturing as a whole. By comparison the change in the cost competitiveness measure over the period was more marginal.

At the industry-level, all industries indicated positive labour productivity growth rates, with eight industries reaching over 10 percent per annum. Transport equipment excluding automobiles was the fastest growing, followed by basic metals, computers and automobiles. Such rapid productivity growth in these industries reflects their rapid growth in fixed capital accumulation and in output share among industries, as indicated earlier. With regard to wage competitiveness, virtually all industries, except printing and

non-metallic minerals, also grew at relatively high rates, with the most rapid growth in the same four industries. There were also thirteen industries displaying positive growth in terms of cost efficiency, with the most rapid growth being in petroleum, basic metals and electronics.

Overall, thirteen of the twenty-three industries exhibited positive growth rates with regard to all three competitiveness indicators. Of the industries growing rapidly on all three indicators, there was only one belonging to the basic-goods group, footwear and leather, while the four others – oil refining, chemicals, basic metals and fabricated metals – were in the intermediate-goods group. The remaining four industries were electrical machinery, electronics, transport equipment excluding automobiles and furniture, and were in the capital-goods group. In contrast, those experiencing low or negative growth rates in terms of labour productivity and the other two indicators were non-metallic minerals and printing and publishing. It should also be noted that, as seen previously, changes in competitiveness indicators at the two-digit industry level were often not uniformly reflected in trends among three-digit industries.

8.4.2 Competitiveness performance differentials between Vietnam and ASEAN-4

8.4.2.1 Relative labour productivity

The overwhelming characteristic of manufacturing industry labour productivity in Vietnam, based on Table 8.9, is that Vietnam's value-added per employee ratio was significantly lower than for the countries of ASEAN-4 at all levels, despite the rapid growth in productivity pointed out earlier. The shortfall in Vietnam's average labour productivity was largest in relation to Malaysia, followed by the Philippines, Thailand, and Indonesia in various years. The least competitive group as compared to Indonesia was the high-tech group, while the intermediate-goods group was the least competitive in comparison to the rest of the countries in ASEAN-4 in the years shown.

At the industry level, Vietnam's weaker competitiveness in terms of labour productivity was reflected in the fact that, while each of the ASEAN-4 had at least two industries in which they were the most competitive industries of all the five countries, Vietnam had none. Tobacco was the only Vietnamese industry with a higher labour productivity level

than Malaysia, Thailand and Indonesia but it was markedly lower than the Philippines. Coke refining and computers were two industries where value-added produced by Vietnamese employees was higher than for Indonesia, but the scale of these industries in both countries was very small, as indicated in the first section. In addition, Vietnam's labour productivity in these industries was very low relative to that in the Philippines and Malaysia.

Vietnam's highest productivity industry, tobacco, was in the labour-intensive group. In contrast, the most productive industries in all three of the ASEAN-4 had moved to the medium-tech and high-tech groups, such as petroleum refining and automobiles. In addition, many of Vietnam's weakest industries were still in the medium and high-tech groups, including paper in relation to all ASEAN-4 in all comparative years, recyclables, oil refining and chemicals in relation to Malaysia and the Philippines, and automobiles and non-metallic minerals in relation to Indonesia in 2005.

An additional aspect of Vietnam's poorer manufacturing labour productivity performance is that none of fifty three-digit industries or segments proved more competitive than their counterparts in all ASEAN-4. There were only one in eight of such industries in which Vietnam recording higher value-added per employee than Indonesia. At this level the least competitive was not in paper, as at industry level, but in three medium- high-tech segments, basic precious and non-ferrous metals, motor vehicles and electronic valves and tubes (ISIC 271, 341, 321). The very low value-added per employee recorded in motor vehicles explains the corresponding low figures of the automobile industry as indicated earlier. Vietnam's labour productivity performance was most limited in comparison to Malaysia, with only one segment, tobacco, achieving a higher level and the highest-lowest gap widening to nearly twenty times in basic chemicals (ISIC 241).

The second major feature of Vietnam's relative labour productivity level is its greater variation within three-digits than within two-digit industries, with value-added per employee showing contradictory patterns within segments of a given two-digit industry. One typical case is the radio, television and communication equipment industry within which Indonesian labour productivity was seven times higher than Vietnam's for the first segment, being electronic valves (ISIC 321), but four times lower for the second,

being television, radio transmitters and apparatus (ISIC 322). Another typical example was in automobiles, with big differences in terms of labour productivity between automobile motor vehicles and parts and accessories for automobiles (ISIC 341 and 343).

Table 8.9 Cross-industry relative labour productivity, (foreign country = 100 in each industry and year), selected years

Industries	INDO 1998	PHI 1998	THAI 2000	MALAY 2000	MALAY 2002	PHI 2003	INDO 2002	INDO 2005
Food & beverage	174	20.4	62.8	24	20.9	17.2	64.1	95.8
Tobacco	335	25.4	27.3	210	332	93.9	332	263
Textiles	85	41.9	25.4	11.2	15.2	27.1	37	83.9
Clothes	79.7	26.2	47	29.6	21.2	34.6	45.3	66.6
Leather & footwear	55.7	34.3	33.1	22.9	17	19.1	37.3	49.4
Group I	**89.9**	**19.6**	**37.8**	**19.2**	**17.4**	**20.7**	**46**	**57.1**
Wood (excl. furniture)	51.1	24.9	22.9	11.5	19.2	45.2	32.9	40.3
Paper	52.2	18	17.2	13	13	19.3	13.9	15.4
Printing & publishing	58.4	50.6	58.9	28.5	21.7	51.2	57.6	45.3
Petroleum refining	455	3.9	17.8	5.4	7.5	1.77	813	167
Chemicals	57.8	17	35.5	10.3	13.5	25.1	47.2	59.3
Rubber & plastic	136	36.8	48.1	25.1	22.4	47.3	90.7	67.5
Non-metallic minerals		30.3	39	16.4	15.7	24		37
Basic metal	27.9	22.6	28.9	17.9	40	67.1	42.1	62.5
Fabricated metal	81.3	47.8	27.4	20.2	20.5	40.8	54.7	57.5
Group II	**78.1**	**19.8**	**32.6**	**15.8**	**17.3**	**19.2**	**50.7**	**48.1**
Machinery	56.1	37.5	24.8	11.9	20.4	28.7	85.6	37.7
Computer	137	37.2	70.9	59.3				
Electric machinery	83.6	31.8	44.8	29.5	24.6	50.7	45.5	64.7
Electronics	114	38.7	60	33.4	36.4	59.7	40.1	78.2
Medical & optical	95.3	63.8	68.7	30.1	15.6	25.9	90.4	99.5
Automobile	97.3	38.6	86.7	49.5	36.9	45.4	33.9	23.1
Other transport equip.	7.3	5.2	113	31	34.8	43.7	28.6	44.4
Furniture	59.8	26.2	38.5	19.7	22.6	41.2	82.6	81
Recyclables	63.5	15.1	25.5	4.5	6.6	47.8	48.9	57.8
Group III	**58.1**	**22.7**	**41.4**	**21.6**	**22.5**	**37.3**	**42.2**	**41.4**
Total	***77.4***	***20.1***	***34***	***15.9***	***15.58***	***22***	***45.7***	***48.8***

Note: Vietnam 2002 is compared to Philippines 2003.
Source: As for Table 8.1.

Third, there appear to be some signs of a competitiveness improvement for some Vietnam industries in terms of labour productivity, between Vietnam and Indonesia and the Philippines and Malaysia at both industry and segment levels in 2000-2005. Higher labour productivity levels were achieved in six industries compared to Malaysia between 2000 and 2002 and fifteen to Indonesia during 2000-05. Of those industries

achieving the highest growth rates as noted earlier, basic metal, transport equipment excluding automobiles, textiles and chemicals were the industries that made the greatest progress in productivity increase. In contrast, automobiles and garments were left furthest behind in the catching up process with Indonesia and Malaysia correspondingly over the same period.

8.4.2.2 Wage competitiveness

The first distinguishing feature of Vietnamese cross-industry relative wage competitiveness during 1998-2002, depicted in Table 8.10, is that the levels are significantly higher than for labour productivity, as shown in Table 8.9. In other words Vietnam was much more competitive relative to ASEAN-4 in terms of value-added per wage unit than it was in terms of value-added per employee, reflecting the low relative wage costs in Vietnam studied in Table 8.6. Further, when compared with significantly higher wage countries, such as Malaysia and Thailand, between one-half and two-thirds of Vietnamese industries showed higher wage competitiveness than the corresponding industry in the other country. For manufacturing as a whole, the wage competitiveness index for Vietnam relative to Thailand stood at 90 in 1998, and relative to Malaysia stood at 90.7 in 2002. By contrast, and as indicated later in more detail, Vietnamese wage competitiveness at virtually all two-digit and three-digit industries was substantially lower than in Indonesia and in the Philippines respectively. For manufacturing as a whole, Vietnam's index stood at 49.6 for the Philippines in 1998 and at 60.5 for Indonesia in 2002. Thus, contrary to normal thinking as well as to the classical theory of the comparative advantage of low labour cost, in comparison with Indonesia, Vietnam only had wage cost competitive advantage for three two-digit industries and nine three-digit industries, a significantly lower proportion of more competitive industries in terms of wage productivity than labour productivity. Thus, for these cases, relative to higher wage countries Vietnam's low wage rates are not reflected in substantial wage cost competitiveness, and this is so for other lower wage countries. In higher wage countries, productivity differences largely offset the wage rate differences, but in lower wage countries this is not so.

Table 8.10 Vietnam cross-industry wage competitiveness relative to ASEAN-4, (foreign country = 100 in all industries and years), selected years

Industries	INDO 1998	PHI 1998	THAI 1998	MALAY 2000	INDO 2002	MALAY 2002
Food & beverage	78.8	55.1	96.1	133	63.2	113
Tobacco	129	30.6	516	338	199	727
Textiles	44.1	97.6	117	62.8	44.5	79.5
Clothes	37.9	53	68.1	128	65.9	109
Leather & footwear	39.6	53	49.4	113	58.2	91.4
Group I	**47.8**	**44.3**	**75.5**	**102**	**58.5**	**95.2**
Wood (excl. furniture)	39	53.3	102	55.1	51.1	84.5
Paper	27.3	53.6	75.8	68.7	19.3	76.8
Printing & publishing	151	117	146	125	75.4	104
Petroleum refining	101	11.9	499	16.7	98.2	25.4
Chemicals	38	48.3	110	58.8	63	75.4
Rubber & plastic	69.2	78.7	100	91.9	103	93.5
Non-metallic minerals		74.5	123	89.6		87.9
Basic metal	46.2	63.3	141	87.8	87.4	209
Fabricated metal	40	70.8	106	103	75.3	109
Group II	**55.9**	**50.8**	**115**	**72.4**	**66.6**	**84.2**
Machinery	46.1	85.6	91.8	94.3	150	123
Computer	90.8	81.2	126	222		
Electric machinery	51.6	60.6	118	114	79.8	103
Electronics	65.4	70.5	183	129	47.4	140
Medical & optical	43.1	90.7	76.2	132	80.2	73.1
Automobile	74.8	83.3	63.8	246	53.2	162
Other transport equipment	7.36	18.9	1591	211	28.7	257
Furniture	63.8	56	77.2	88.9	92	107
Recyclables	27.6	40.9	139	119	92.7	116
Group III	**46.6**	**53.1**	**83.5**	**113**	**57.8**	**120**
Total	***50.3***	***49.6***	***90***	***87.2***	***60.5***	***90.7***

Source: As for Table 8.1.

The results of the wage competitiveness comparison between Vietnam and ASEAN-4 higher wage countries are similar to those conducted by UNCTAD (1999, cited by Weiss 2002). According to the UNCTAD findings, in 1995 across eight industries and compared to United States, a number of NICs had one or two industries, and in particular Kenya even had four industries, that were uncompetitive in terms of wages. Thereby the lower wage competitiveness of Vietnam compared to ASEAN-4 for a number of industries provides more evidence that, contrary to traditional theory and common thinking on the comparative advantage of low labour costs in later

industrializing economies, these countries can in some cases be less competitive in terms of value added per wage unit.

8.4.2.3 Cost competitiveness

Based on Table 8.11, and despite several features which are similar to those for the previous indicators, Vietnam's cost competitiveness shows some very different features. First, for virtually all groups and industries Vietnam had higher relative cost efficiency than relative labour productivity, implying that lower labour and other input costs substantially offset lower labour productivity. Secondly, relative to the higher wage countries such as Thailand and Malaysia, Vietnam had generally high cost efficiency in the latest year for which data are available (2002 and 2002 respectively). Vietnam's overall cost efficiency was one-third higher than that of Thailand in 2000, and higher also in all but five two-digit industries. In relation to Malaysia, Vietnam's aggregate cost efficiency index was above 100 in 2000 and close to 100 (95.0) in 2002, with its competitiveness being particularly strong in the labour-intensive group, and was also at 91.9 relative to the Philippines in 2003. Relative to Indonesia the index stood at 69.3 in 2002, with Vietnam being more cost efficient in three industries, tobacco, basic metals and fabricated metals.

As was the case with other competitiveness indices, there is increased variability at the three-digit industry or segment level. Around one-seventh and one-third of total Vietnamese segments showed higher relative cost efficiency than their Indonesian and Malaysian counterparts. By 2002, five segments, tobacco, knitwear, leather, basic steel and domestic appliances (ISIC 160, 173, 191, 271, 293), had higher cost efficiency in Vietnam than in both the other countries. In particular, the three first three-digit industries remained Vietnam's most competitive segments relative to both comparative countries in both years 2000, 2002. The strong cost competitiveness of the basic steel segment explained most of that of the basic metals industry, since the other segments of this industry, in particular cast metal, were less competitive (see Appendix Table 8.4). On the other side, more than half of all manufacturing segments in all comparative countries recorded higher cost efficiency than in Vietnam. Of these manufacturing segments, motor vehicles and medical appliances (ISIC 341, 331) were the least

competitive, with value-added per unit cost in Malaysia and Indonesia being about five times higher respectively than in Vietnam in 2002.

Table 8.11 Vietnam cross-industry cost efficiency relative to ASEAN-4, (foreign country = 100 for each country and year)

Industries	INDO 1998	PHI 1998	THAI 1998	MALAY 2000	THAI 2000	INDO 2002	MALAY 2002	PHI 2003
Food & beverage	89.4	70.2	92.6	121	132	59.7	133	68.3
Tobacco	78.5	113	125	300	24.4	122	388	166
Textiles	92.9	107	112	65.8	134	46.7	65.2	61.2
Clothes	116	98.5	186	136	157	75.6	113	95.7
Leather & footwear	57.4	74.2	103	101	108	96.1	86.8	76.4
Group I	**80.2**	**78.2**	**111**	**128**	**130**	**62.9**	**145**	**79.7**
Wood (excl. furniture)	67.1	77.1	99.9	69.7	93.9	38.5	67.9	81.3
Paper	49.8	68	95.7	55.7	84.5	44.4	42.9	54.3
Printing & publishing	69.2	83	78.7	65.3	100	33.6	43.5	65.8
Petroleum refining	21.4	64.4		87.6	261	52.8	197	140
Chemicals	51.2	58.6	143	67.5	172	66.7	69.8	77.8
Rubber & plastic	122	92	110	67.2	115	57.4	44.4	51.5
Non-metallic minerals		99.4	144	103	148		59.1	88.2
Basic metal	57.2	75.8	196	103	162	108	146	176
Fabricated metal	56.6	75.3	129	86	111	415	63.9	83.8
Group II	**71.5**	**84.3**	**127**	**88.9**	**155**	**93.2**	**76.3**	**80.3**
Machinery	70.1	94.8	120	60.5	102	55.4	75.1	80.7
Computer	3.21	31.6	11.6	41.7	21.9			
Electric machinery	87.4	97.2	121	117	116	48.9	58.9	74.9
Electronics	65.9	53	264	107	73.6	28.4	93	93.9
Medical & optical	110	71.7	108	116	177	25.9	62.9	47
Automobile	60	199	113	218	470	52.3	93.4	125
Other transport equipment	26.3	91		74.9	158	42.1	62.9	105
Furniture	47.4	67.5	90.5	107	122	72.6	89.4	85.2
Recyclables	32.7	81.9	453	103	129	47.8	60.5	37.3
Group III	**42**	**70.1**	**108**	**113**	**121**	**45**	**97.5**	**111**
Total	***69.3***	***83.5***	***124***	***106***	***136***	***69.3***	***95***	***91.9***

Note: Vietnam 2002 is compared to Philippines 2003.
Source: As for Table 8.1.

The majority of Vietnam's highly competitive industries and segments remained in the labour-intensive and basic-goods group, with only one belonging to the intermediate-goods group and all of the least competitive being in the high-tech group. The number of Vietnamese competitive industries and segments on the basis of wage productivity exceeding those on cost productivity indicated that Vietnam deployed material cost, the major component of the total cost, less efficiently than labour cost.

8.4.2.4 Total factor productivity

The first point apparent from Table 8.12 is that Vietnam's TFP levels for the manufacturing industry average, for all groups and for the majority of industries, were lower than those of all ASEAN-4, with the exception of Indonesia in the crisis year 1998. With this exclusion, Vietnam's relative TFP level was significantly low (index significantly less than 100) for all groups in all four countries, other than for group 1 relative to Thailand in 1998, and was also lower for the vast majority of two-digit industries.

Secondly, Vietnam's TFP, and hence its competitive position in terms of technical efficiency, was reflected in the fact that her relative TFP level was lowest in the high-tech group for all countries and years shown, with the exception of the Philippines in 1998. In this case Vietnam's relative TFP level was very low (35.2), but was even lower in comparison to the Philippines in the other two groups.

As might be expected given the nature of this measure, Vietnam's relative TFP level also varied strongly between groups and industries, with one of the lowest industries, relative to some countries, being transport equipment excluding automobiles, a member of the high-tech group. At the industrial level, in 2000 Vietnam merely had two industries with a higher TFP level than the corresponding industry in Malaysia, and only three in 2002. Relative to Indonesia in 2002 there were seven such industries. In particular, tobacco, chemicals and basic metals showed a generally high level of relative TFP. Across forty-one three-digit industries, the number in which Vietnam had higher relative TFP than Indonesia was two in 2000 and eight in 2002. It is also noticeable that deviations across TFP segment levels are much larger than by other indices.

Table 8.12 Vietnam cross-industry TFP relative to ASEAN-4, 1998, 2000 and 2002, (foreign country =100 percent)

Industries	INDO 1998	PHI 1998	THAI 1998	INDO 2000	THAI 2000	MALAY 2000	INDO 2002	MALAY 2002
Food & beverage	292	15	30.1	155	21.7	68.1	56.8	72.6
Tobacco	1516	97.6	60.2	96.4	2.58	743	170	1379
Textiles	263	16.5	46.6	28.3	9.96	39.1	32	51.9
Clothes	129	20.8		65.1	2.4	49.2	151	30
Leather &footwear	62.6	18	13	33.3	12.2	42.3	31.6	47.4
Group I	**236**	**12.7**	**31.4**	**77.2**	**14.1**	**63.8**	**72**	**67.7**
Wood (excl furniture)	332	77.2	30.8	25.9	18.5	43.1	40.1	88
Paper	293	28.8	10.7	48.9	20.8	60.2	47.4	54.9
Printing & publishing	283	62	24.3	28.2	31	91.9	62.8	60.1
Petroleum refining	2471	65.2		38.1		43	125	93.5
Chemical	213	20.9	64.6	59	18	123	118	181
Rubber & plastic	176	26.2	43.1	41.9	3.51	43.9	57.2	42.2
Non-metallic mineral		87.5	74			44.6		62.9
Basic metal	278	14.2	144	64	28.1	85.4	159	178
Fabricated metal	112	23.5	22.2	19.6		40.4	178	46.2
Group II	**290**	**29**	**61.8**	**37.6**	**11.9**	**54.5**	**75.1**	**68.9**
Machinery	175	101	68.2	59.1	12	27.7	213	50.1
Computer	42.2	12.8	11.5	59.8	14	40.8		
Electric machinery	152	28.5	45.4	17.7	24.6	58.1	69.6	56.3
Electronics	519	68.4	175	46.1	24.3	46.4	17.7	66.4
Medical & optical	139	71.1	62.4	27.7	30	33.7	157	20.5
Automobile	397	63.9	105	23.2	26.6	80.7	25.1	69.4
Other transport equipment	28.4	15.6		9.4		49.5	16.9	60.7
Furniture	75.6	26.9	20.3	77.9		52.2	85.5	59
Recycles				516	55.6	51.3	34.8	13.8
Group III	**127**	**35.2**	**51.1**	**30.4**	**20.2**	**47.5**	**46.7**	**63.1**
Total	***236***	***28***	***50.7***	***48.5***	***15.8***	***55.5***	***67.9***	***65.1***

Source: As for Table 8.1.

Vietnam's TFP levels relative to Indonesia across industries as well as segments were not generally as high as those for Malaysia, although there were some industries where this was not the case. In the case of Malaysia in 2002, the competitiveness status of Vietnam compared to Malaysia was much better if measured by TFP (65.1) against 24.4 for labour productivity. Moreover, contrary to other competitiveness indices for which virtually all Vietnam industries substantially lagged behind counterparts in Malaysia, Vietnam's relative TFP level for chemicals and basic metals was 181 and 178 respectively, while the corresponding figures for labour productivity were 13.5 and

40.0. In these industries, Vietnam's relative TFP was in sharp contrast to her very low labour and cost productivity for these industries, except the Vietnam/Philippines average TFP ratio which was significantly lower than other single competitiveness indices.

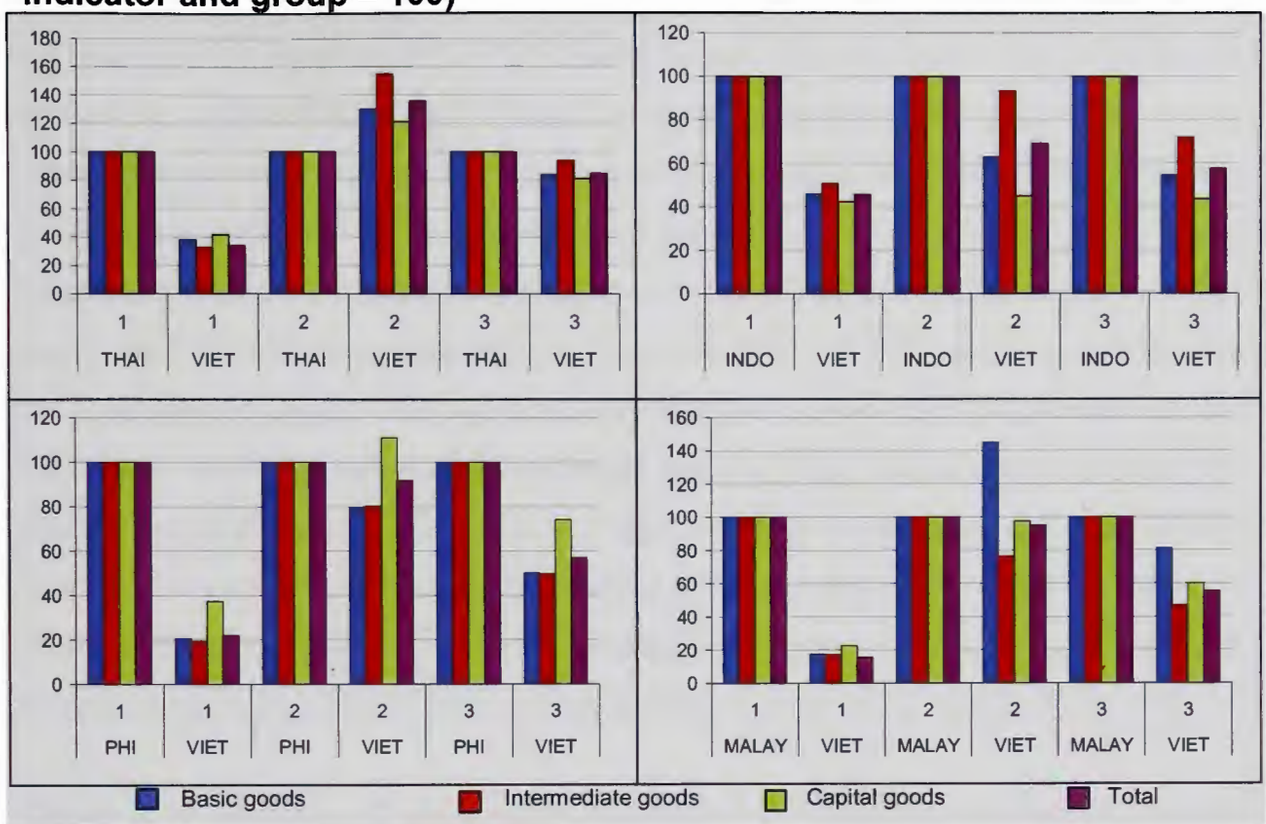
8.4.2.5 Overall competitiveness

Table: 8.13 Vietnam's cross-industry overall competitiveness (%) relative to Thailand in 2000, Indonesia and Malaysia 2002 and Philippines in 2003

Industries	THAI 2000	INDO 2002	MALAY 2002	PHI 2003
Food & beverage	97.2	61.9	77	42.8
Tobacco	25.8	227	360	130
Textiles	79.9	41.9	40	44.1
Clothes	102	60.5	67	65.1
Leather &footwear	70.6	66.7	52	47.7
Group I	**83.9**	**54.4**	**81**	**50.2**
Wood (excl furniture)	58.4	35.7	44	63.2
Paper	50.9	29.2	28	36.8
Printing & publishing	79.6	45.6	33	58.5
Coke refining	139	433	102	70.9
Chemical	104	57	42	51.5
Rubber & plastic	81.3	74	33	49.4
Non-metallic mineral	93.7		37	56.1
Basic metal	95.4	75	93	122
Fabricated metal	69	235	42	62.3
Group II	**93.8**	**72**	**47**	**49.7**
General machinery	63.5	70.5	48	54.7
Electric machinery	80.4	47.2	42	62.8
Electronics	66.8	34.3	65	76.8
Medical & optical	123	58.2	39	36.5
Automobile	279	43.1	65	85.2
Other transport equipment	136	35.4	49	74.4
Furniture	80.1	77.6	56	63.2
Recycles	77.4	48.4	34	42.5
Group III	**81.2**	**43.6**	**60**	***74.2***
Total	***84.7***	***57.5***	***55.3***	***56.9***

Source: As for Table 8.1.

Figure: 8.4 Vietnam's labour productivity (1), cost efficiency (2) and overall competitiveness (3) relative to Thailand 2000, Indonesia 2002, Philippines 2003 and Malaysia 2002 (base for each foreign country, indicator and group = 100)



Note: Vietnam 2002 is compared to Philippines 2003.
Source: Based on Tables 8.9, 8.11 and 8.13.

Table 8.14 Vietnam most and least competitive groups and industries

Industry	Thailand 2000	Indonesia 2002	Malaysia 2002	Philippines 2003
The most competitive				
Group	**Intermediate**	**Basic**	**Basic**	**Capital**
Industry	Automobile	Petroleum & coke refining	Tobacco	Tobacco
	Other transport equipment	Fabricated metal	Petroleum & coke refining	Basic metal
	Chemicals	Tobacco	Basic metal	Automobile
The least competitive				
Group	**Capital**	**Capital**	**Intermediate**	**Intermediate**
Industry	Tobacco	Paper	Paper	Medical & optical
	Paper	Electronics	Printing & publishing	Paper
	Wood	Other transport equipment	Rubber & plastic	Recyclables

Source: As for Table 8.1.

8.5 The effects of production factor disparity on industry level competitiveness differentials

In this section the model derived from Pilat (1996), outlined in Chapter 5 (Section 5.2.3) and expressed in equation (9) of that chapter, is used for a preliminary test of effect of differences in disembodied technology, labour skills, capital intensity and other factors on relative competitiveness. Here the analysis is undertaken for Vietnam and Indonesia in 2000 and 2002, and the competitiveness measure used is labour productivity. Four independent variables are used in the regressions, which are undertaken across two-digit and three-digit industries separately, for the years 2000 and 2002 and for a pooled data set covering both years. The four variables used are relative TFP (as a proxy for the relative level of disembodied technology); relative fixed assets per employee (F); relative wages per unit of value added (W), as a proxy for skill levels; and relative firm size (S). Two different definitions of firm size are used: employees per firm in the upper panel, and output per firm in the lower panel. As discussed in Chapter 5, the variables are expressed in logarithmic form and the analysis is across three-digit industry data.

Table 8.15 Results of regression analysis of industry and segment level disparity in underlying production factors on labour productivity differentials between Vietnam and Indonesia, 2000 and 2002

	Cross-section 2000		Cross-section 2002		Pooled 00-02	
	Independent variable: log relative labour productivity					
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	-6.6	-7.22	-2.54	-3.73	-2.08	-3.47
LNF	0.5	8.37	0.54	6.84	0.42	6.83
LNW	0.53	3.27	0.3	1.6	0.18	1.18
LNTFP	1.2	8.36	0.69	8.41	0.58	7.8
LNS (output)	0.2	3.03	0.05	0.58	0.25	3.86
$\overline{R^2}$	0.84		0.83		0.72	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	-8	-7.46	-2.35	-3.69	-2.68	-3.86
LNF	0.55	8.1	0.53	7.2	0.47	6.93
LNW	0.76	4.8	0.43	2.5	0.47	2.94
LNTFP	1.35	8.59	0.69	9.65	0.66	8.37
LNS (employee)	0.08	1.07	-0.12	-1.37	-0.05	-0.6
$\overline{R^2}$	0.83			0.86		0.68
Observations	39		38		76	

Note: Dependent variable: labour productivity differentials.
Source: As for Table 8.1.

Table 8.15 presents the regression-based findings on the effects of underlying factor productions on the cross-industry competitiveness differential measured by labour productivity between Vietnam and Indonesia in 2000 and 2002. The regression results based on cross-section data as well as panel data show that differences in technology levels, as indicated in the efficiency of use of the factors of production (TFP) had a strong positive impact on labour productivity differentials. The cross-industry disparities between two countries in both embodied technology and in employee skill, represented respectively by fixed capital and labour cost per employee, also generally had strong positive associations with the differences in competitiveness levels between these countries, although the skill variable is only marginally significant in some cases.

The effects of relative firm size on relative labour productivity were shown as different for different specifications of this variable. If the number of employee per firm is selected as being the normal criterion used by most governments and organizations, the impact of firm size on competitiveness indices was insignificant. The firm size effect, however, turned to be strikingly positive if its proxy was output value per firm, which might be thought to be a more precise measure of economies of scale.

8.6. Key findings and overall conclusion

1. During twenty years since the launch of economic reform and open policy in 1986, there were significant rapid growth and considerable structural transformation of manufacturing in Vietnam toward the structure of industrialized economies. The major share in total input and output shifted from the basic-goods, labour-intensive to the capital-goods, high-technology group, approaching the proportion of Indonesia by 2005. Nevertheless Vietnam's manufacturing structure by industry still lagged all ASEAN-4 owing to the lower share of the intermediate-goods and the considerably high share of the basic-goods and low-technology group. The proportion of the high-tech group in total gross output or value-added was still around ten years later than that of Thailand and Malaysia being respectively middle and middle-high income, amd industrializing and industrialized countries.

2. The growth and structural change of Vietnam manufacturing was certainly conditioned by the high rise of single productivity, labour, wages, as well as total productivity for all groups and industries. This was subsequently owing partly to the very low initial level of Vietnam's productivity and therefore, despite her rapid growth of all productivity indicators on the average, for all groups, most of the industries and segments pronounced lower competitiveness levels than those of all ASEAN-4. As measured by labour productivity Vietnam's competitiveness as a whole represented about a half, one-third, one-fourth and one-fifth that in Indonesia, Thailand, the Philippines and Malaysia correspondingly. Expressed by cost efficiency and TFP, Vietnam also was less competitive but to a lower extent as compared to Malaysia and Indonesia. Vietnam did not show wage competitiveness or lower labour cost advantage to the ASEAN-4 as a whole, in most industries and segments in particular. Vietnam revealed as least competitive in the medium and high value-added, technology intensive groups as well as a number of relevant industries and segments.

3. The lower competitiveness levels of Vietnam's manufacturing as compared to ASEAN-4 was explained by the former' evident disadvantages in all underlying competitiveness determinants comprising of both visible, quantitative and invisible and qualitative production factors. The crucial gaps in fixed capital and wage rate between Vietnamese and Malaysian firm size to Indonesia were indicated as the more particular determinants on competitiveness disparities. However, lower levels of labour cost and TFP or qualitative factors including disembodied technology, institutions and managing skills, apparently were virtually identified as the reasons for Vietnam competitiveness's lagging behind the Philippines and Thailand.

4. Theoretically, the analysis of MC at industry and national level provides a valuable supplement to the work at firm-level, revealing more substantially the level of international MC of an economy. In the case of Vietnam, as compared to only four comparable regional economies at industry and national level, Vietnam's MC is lower on most of the single indices and on the overall index. While on the basis of firm-level analysis, the MC of Vietnam firms appears to be

stronger than that of foreign firms, since wholly foreign-owned enterprises stood at the medium-level in the competitiveness ladder of manufacturing enterprises.

Appendix Table 8.1 Cross-segment growth rate of and share in total value-added (1) and fixed capital (2) of Vietnam manufacturing, 1998, 2000, 2005, at 2000 year price

ISIC	Segments	Growth rate (%)				Share in (%)	
		1	2	1	2	1	2
		1998-05		2000-05		2005	
151	Processed meat, fish, vegetable, fats	47	53.1	37.3	14.1	6.3	3.08
152	Dairy products			13	17.3	1.07	0.91
153	Grain mill products: starches, animal feeds	42.3	59.7	28.1	20.2	4.86	2.74
154	Other food products	18.8	44.9	15.2	2.47	3.86	5.6
155	Beverages	19.5	50.9	19.1	11.9	6.07	3.96
160	Tobacco	23.5	68.4	26	16.7	4.57	0.61
171	Spinning, weaving and finishing of textiles	15.3	43.5	23.1	15.2	3.71	8.06
172	Other textiles	24.5	49.3	35.4	17.8	1.08	1.34
173	Knitted and crocheted fabrics and articles	25.1	65.3	24.6	41.8	0.3	0.4
181	Wearing apparel, except fur apparel	31	72.6	21.7	24.1	5.77	4.48
182	Dressing & dyeing of fur, processing of fur	8.68	85.1	4.69	18.4	0.03	0.07
191	Tanning, dressing and processing of leather	36.9	43.4	26.7	31.1	0.71	0.53
192	Footwear	25.4	42.7	20.7	15.2	5.7	6.11
201	Sawmilling and planning of wood	28	77.5	26.8	17.3	0.39	0.37
202	Products of wood, cork, straw, etc.	30.4	67.7	22.3	18.4	1.21	1.29
210	Paper and paper products	18.4	49.3	16.9	18	1.67	3.48
221	Publishing	10.1	56.8	11.6	32.1	0.46	0.27
222	Printing and related service activities	20	48.8	17.3	20.3	1.06	1.15
232	Refined petroleum products	64.3	92.9	14.8	-9.47	0.27	0.15
241	Basic chemicals	19.6	55.5	26	28.3	1.81	2.74
242	Other chemicals	28.9	42	24.7	10.1	5.18	2.94
251	Rubber products	9.04	28.2	1.3	-7.47	1.01	1.01
252	Plastic products	12.4	16.5	5.85	-3.64	2.83	4.05
261	Glass and glass products	16.8		-1.5	-9.49	0.38	0.65
269	Non-metallic mineral products n.e.c	16.4	70.2	10.1	1.93	6.18	14
271	Basic iron and steel	24.8	39.7	29	17.2	3.27	3.19
272	Basic precious and non-ferrous metal	14.3	91.6	26.8	20	0.17	0.18
273	Casting of metal	32.5	144	23.6	30.8	0.15	0.3
281	Struct metal products; tanks; steam generators	45.5	49.6	35.9	18.8	1.62	1.83
289	Other metal products; metal working services	41.8	67.5	49.5	28.2	2.67	2.91
291	General purpose machinery	24.5	42.7	25.6	28.6	0.41	0.77
292	Special purpose machinery	9.69	47.2	13.9	5.02	0.56	0.73
293	Domestic appliances n.e.c	30.5	49.7	38.1	10.1	0.61	0.47
301	Office, accounting and computing machinery	45.9	22.8	45.8	15.9	1.89	1.09
311	Electric motors, generators and transformers	27.4	21.9	16.1	-0.59	0.72	0.52
312	Electricity distribution & control apparatus	23	22.6	37.3	18.2	0.17	0.14
313	Insulated wire and cable	37.2	64.1	28.8	17.9	1.52	1.69
314	Accumulators, primary cells and batteries	8.62	31.9	4.21	6.53	0.11	0.13
315	Lighting equipment and electric lamps	7.96	30.3	7.24	2.93	0.18	0.13
319	Other electrical equipment n.e.c	114	306	60.6	33	1.42	0.74
321	Electronic valves, tubes, etc	11.8	40.8	43.7	14.2	0.42	0.45
322	TV/radio transmitters; line comm. Apparatus	24.1	53.2	38.1	26.2	0.78	0.79
323	TV and radio receivers and associated goods	32.8	66	24	-6.44	1.55	0.68

331	Medical, measuring, testing appliances, etc	19	41.2	9.54	5.58	0.14	0.27
332	Optical instruments & photographic equipment	38.4	189	21.6	0.56	0.12	0.11
333	Watches and clock			49.5	116	0.02	0.08
341	Motor vehicles	57	71.1	37.2	3.04	3.15	1.12
342	Automobile bodies, trailers & semi-trailers	-11	52.3	52.1	43.1	0.05	0.1
343	Parts/accessories for automobiles	42.9	99.9	23.2	40	0.69	1.14
351	Building and repairing of ships and boats	43.2	86.8	26.8	18.7	1.88	2.86
352	Railway/tramway locomotives & rolling stock	6.4	37.3	-2.6	1.36	0.02	0.01
359	Motorcycles, bicycles & other			42	20.4	4.56	2.81
361	Furniture	86	143	56	54.3	3.21	3.28
362	Manufacturing n.e.c	50	63	21	16.4	1.23	0.92
371	Recycling of metal waste and scrap	69		40	125	0.01	0.01
372	Recycling of non-metal waste and scrap			50	68.9	0.01	0.02

Source: As for Table 8.1.

Appendix Table 8.2: Employment distribution for industries in Vietnam and ASEAN-4 (%), 1998, 2000, 2002 and 2005

Industries	VIET	INDO	PHI	THAI	VIET	INDO	THAI	MALAY
	Employment				Employment			
	1998	1998	1998	1998	2000	2000	2001	2000
Food & beverage	12.2	14.9	11.6	18.6	17.3	14.1	16.9	8.0
Tobacco	1.1	6.0	0.7	0.4	0.8	5.9	0.5	0.6
Textiles	10.6	15.0	5.1	10.0	8.1	15.8	10.1	2.9
Clothes	15.6	8.8	15.1	7.0	14.1	11.6	6.3	4.8
Leather & footwear	19.2	7.3	4.1	3.9	19.1	6.7	4.6	0.6
Group I	**58.6**	**52.1**	**36.6**	**39.9**	**59.4**	**53.9**	**38.4**	**16.9**
Wood (excl. furniture)	2.5	10.2	2.3	2.1	3.9	9.4	2.3	8.1
Paper	2.7	3.0	2.3	1.4	2.3	2.6	1.9	2.1
Printing & publishing	1.8	1.3	2.9	1.6	1.4	1.4	1.9	2.2
Petroleum refining	0.1	0.2	0.3	0.1	0.1	0.1	0.3	0.5
Chemicals	4.0	6.0	5.3	3.1	3.7	4.7	3.7	3.0
Rubber & plastic	3.5	6.7	4.0	8.8	3.3	7.2	8.2	10.8
Non-metallic minerals	7.1	0.0	4.6	6.4	8.1	0.0	5.6	3.8
Basic metal	2.9	1.4	3.8	1.6	1.9	1.4	1.7	2.7
Fabricated metal	2.3	2.7	3.8	5.3	2.7	2.6	4.5	4.3
Group II	**26.7**	**31.6**	**29.2**	**30.1**	**27.3**	**29.3**	**30.2**	**37.5**
Machinery	2.8	1.1	3.5	4.7	2.0	1.1	3.6	3.3
Computer	0.3	0.0	2.2	1.8	0.2	0.0	2.6	4.6
Electric machinery	2.4	1.5	4.5	4.3	2.4	1.8	4.9	5.0
Electronics	1.5	3.0	12.1	6.4	1.0	3.7	6.6	21.2
Medical & optical	0.4	0.4	3.5	0.6	0.4	0.5	1.2	1.9
Automobile	1.0	1.0	1.9	3.9	0.8	1.2	4.4	2.2
Other transport equipment	2.3	1.7	1.1	0.8	2.2	1.7	1.1	1.4
Furniture	4.0	7.5	5.3	7.5	4.2	6.7	7.0	6.0
Recyclables	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.0
Group III	**14.6**	**16.3**	**34.2**	**30.0**	**13.3**	**16.7**	**31.5**	**45.6**
Total	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***

Industries	VIET	INDO	PHI	MALAY	VIET	INDO
		Employment			Employment	
	2002	2002	2003	2002	2005	2005
Food & beverage	15.8	14.1	15.4	8.6	14.0	16.8
Tobacco	0.5	6.7	1.5	0.7	0.5	6.0
Textiles	6.3	14.3	1.7	3.0	6.1	12.7
Clothes	15.3	11.9	2.7	5.3	16.8	10.2
Leather & footwear	19.8	6.6	0.6	0.5	18.1	5.1
Group I	**57.7**	**53.6**	**21.9**	**18.1**	**55.4**	**50.8**
Wood (excl. furniture)	3.5	9.5	0.6	7.5	3.6	8.0
Paper	2.2	2.4	1.8	2.3	2.3	2.7
Printing & publishing	1.4	1.3	0.9	2.5	1.4	1.2
Petroleum refining	0.0	0.0	12.4	0.4	0.0	0.1
Chemicals	3.1	4.4	7.9	3.3	2.6	4.7
Rubber & plastic	3.5	8.7	2.3	11.3	3.7	7.9
Non-metallic minerals	8.0	0.0	2.8	3.9	7.0	3.8
Basic metal	1.5	1.4	4.5	2.8	1.4	1.4
Fabricated metal	3.1	2.9	2.2	4.5	4.0	2.9
Group II	**26.3**	**30.6**	**35.3**	**38.4**	**26.1**	**32.6**
Machinery	1.9	2.6	3.3	3.3	1.7	1.8
Computer		0.0	7.6	4.0	0.4	0.1
Electric machinery	2.7	1.5	3.2	4.5	2.7	1.8
Electronics	1.0	2.1	19.6	18.9	1.2	3.3
Medical & optical	0.4	0.1	1.3	1.6	0.4	0.3
Automobile	1.1	1.5	5.1	3.2	1.2	1.7
Other transport equipment	2.8	1.2	1.5	1.7	2.8	1.4
Furniture	6.2	6.8	1.2	6.4	8.2	6.1
Recycles	0.0	0.0	0.0	0.0	0.0	0.1
Group III	**16.1**	**15.8**	**42.8**	**43.6**	**18.5**	**16.5**
Total	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***	***100.0***

Source: As for Table 8.1.

Appendix Table 8.3 Vietnam cross-segmental annual growth rate of competitiveness indices over period 1998-2005 (%) (1: labour productivity, 2: cost efficiency, 3: mean of (1 +2))

ISIC	Segments	1	2	3	ISIC	Segments	1	2	3
151	Processed meat, fish, vegetable, fats	18.1	13.3	12.5	281	Struct. metal products; tanks; steam generators	8.15	12.2	0.24
152	Dairy products	13	14	6.17	289	Other metal products; metal working services	12	12.4	3.94
153	Grain mill products: starches, animal feeds	12.2	11.2	16	291	General purpose machinery	21.7	11.4	-0.2
154	Other food products	0.04	-0.8	0.09	292	Special purpose machinery	5.95	-1.18	-1.3
155	Beverages	16	6.99	1.62	293	Domestic appliances n.e.c	16.3	8.75	-1.8
160	Tobacco	-0.6	7.38	1.29	311	Electric motors, generators and transformers	24.8	22.5	15.3
171	Spinning, weaving and finishing of textiles	14.7	7.29	0.99	312	Electricity distribution & control apparatus	24.1	32.2	3.23
172	Other textiles	23.4	13.9	6.53	313	Insulated wire and cable	15.6	16.9	5.97
173	Knitted and crocheted fabrics and articles	8.41	8.3	0.75	314	Accumulators, primary cells and batteries	4.03	2.71	-7.8
181	Wearing apparel, except fur apparel	7.35	6.47	-0.47	315	Lighting equipment and electric lamps	1.59	2.49	-7.5
182	Dressing & dyeing of fur, processing of fur	22.9	16	12.5	319	Other electrical equipment n.e.c	26.9	13.7	37.4
191	Tanning, dressing and processing of leather	17.9	13.5	14.5	321	Electronic valves, tubes, etc	2.13	-0.92	6.7
192	Footwear	5.92	9.11	6.44	322	TV/radio transmitters; line comm. Apparatus	33.6	37.6	18.4
202	Products of wood, cork, straw, etc.	4.15	1.17	0.79	323	TV and radio receivers and associated goods	26.5	33.7	25.4
210	Paper and paper products	20.8	8.04	-5.22	331	Medical, measuring, testing appliances, etc	11.5	13.1	4.16
221	Publishing	35.6	9.03	13.8	332	Optical instruments & photographic equipment	-7.14	2.53	1.67
222	Printing and related service activities	-5.08	-4.8	-2.81	341	Motor vehicles	68.3	66	4.73
232	Refined petroleum products	-2.79	0.84	10.9	342	Automobile bodies, trailers & semi-trailers	27.9	15.3	-19
241	Basic chemicals	15.6	7.09	2.27	343	Parts/accessories for automobiles	15.3	22	7.1
242	Other chemicals	18.7	12.4	9.07	351	Building and repairing of ships and boats	38.8	40.1	9
251	Rubber products	18	12.3	1.76	352	Railway/tramway locomotives & rolling stock	0.9	-3.41	-7.4
252	Plastic products	6.15	3.93	-0.56	353	Aircraft and space crafts	0.84	42.3	2.11
261	Glass and glass products	11.6	14.3	3.49	359	Transport equipment n.e.c	15	13	8.63
269	Non-metallic mineral products n.e.c	0.69	-2.2	-1.49	361	Furniture	13.9	7.75	1.15
271	Basic iron and steel	41.1	34	14.3	362	Manufacturing n.e.c	20.6	16.7	15.6
272	Basic precious and non-ferrous metal	26.8	10.4	2.07	371	Recycling of metal waste and scrap	112	185	-9.4
273	Casting of metal	25.1	11.3	5.18	372	Recycling of non-metal waste and scrap	31.9	4.61	22.3

Source: As for Table 8.1.

Appendix Table 8.4 Vietnam cross-segmental overall competitiveness levels relative to Indonesia and Malaysia, 2002 (1: labour productivity, 2: cost efficiency, 3: mean of (1 +2))

ISIC	Segments	INDO			MALAY		
		1	2	3	1	2	3
		2002			2002		
151	Processed meat, fish, vegetable, fats	32.5	56.2	44.4	12.7	145	79.1
152	Dairy products				62	114	88
153	Grain mill products: starches, animal feeds	97.2	75.1	86.1	33.1	150	91.6
154	Other food products	56.2	37.4	46.8	17.9	52.5	35.2
155	Beverages	90.9	39	65	25.7	92.2	58.9
160	Tobacco	333	122	228	334	390	362
171	Spinning, weaving and finishing of textiles	37.9	43.3	40.6	17.6	72.1	44.9
172	Other textiles	70.8	54.3	62.5	11.6	40.1	25.8
173	Knitted and crocheted fabrics and articles	31.3	131	81.4	7	112	59.5
181	Wearing apparel, except fur apparel	45.4	75.8	60.6	21.2	113	67.3
182	Dressing & dyeing of fur, processing of fur						
191	Tanning, dressing and processing of leather	35.9	178	117	23.2	133	78.2
192	Footwear	37.8	86.9	62.3	16.6	77.2	46.9
201	Sawmilling and planning of wood	73.2	25	49.1	42	78.9	60.4
202	Products of wood, cork, straw, etc.	24.5	41.8	33.2	14	64.8	39.4
21	Paper and paper products	14	44.5	29.2	13.1	43	28
221	Publishing	55.2	18	36.6	18.7	32.5	25.6
222	Printing and related service activities	95.1	87.3	91.2	28.3	52.4	40.3
231	Coke oven products						
232	Refined petroleum products	641	72.6	357	7.5	198	103
241	Basic chemicals	19	108	63.7	5.1	74.1	39.6
242	Other chemicals	63.4	37.3	50.4	31.8	73.9	52.8
251	Rubber products	41	58	49.5	14.7	49.3	32
252	Plastic products	130	47.9	89	23.9	39.4	31.7
261	Glass and glass products				15.9	50.2	33.1
269	Non-metallic mineral products n.e.c				17.7	64.1	40.9
271	Basic iron and steel	49.7	112	80.6	43.7	151	97.4
272	Basic precious and non-ferrous metal	10.6	94.4	52.5	10.7	123	66.8
273	Casting of metal	60.6	51.2	55.9	31.8	94.2	63
281	Struct metal products; tanks; steam generators	35.9	50.6	43.3	24.2	55.9	40
289	Other metal products; metal working services	62.6	541	302	19.4	67	43.2
291	General purpose machinery	28	41.1	34.5	12	75	43.5
292	Special purpose machinery	120	38	79	23.9	47.4	35.6
293	Domestic appliances n.e.c	277	109	193	44.6	190	117
30	Office, accounting and computing machinery						
311	Electric motors, generators and transformers	17.1	18.3	17.7	25	58.3	41.6
312	Electricity distribution & control appartus	97.1	87.3	92.2	32.3	108	70.2
313	Insulated wire and cable	86.4	51.4	68.9	28.4	50.4	39.4
314	Accumulators, primary cells and batteries	19.6	47.8	33.7	18.8	55.4	37.1
315	Lighting equipment and electric lamps	35.6	46.4	41	15.4	62	38.7

319	Other electrical equipment n.e.c	64.5	76.3	70.4	31.1	41.5	36.3
321	Electronic valves, tubes, etc	13	21.8	17.4	13.1	97.2	55.1
322	TV/radio transmitters; line comm. Apparatus	447	15	231	44.5	75	59.7
323	TV and radio receivers and associated goods	58.7	46.1	52.4	63	119	91.2
331	Medical, measuring, testing appliances, etc	57.4	14.9	36.2	8.6	37.5	23.1
332	Optical instruments & photographic equipment	298	55.8	177	50.4	199	125
333	Watches and clock	34.1	14.9	24.5	8	18.1	13.1
341	Motor vehicles	12.9	38.9	25.9	51.5	115	83.2
342	Automobile bodies, trailers & semi-trailers	85.2	43	64.1	18.9	65	42
343	Parts/accessories for automobiles	-344	-662	-503	14.9	43.5	29.2
351	Building and repairing of ships and boats	42	26.6	34.3	16.2	48.6	32.4
352	Railway/tramway locomotives & rolling stock						
353	Aircraft and space crafts						
359	Transport equipment n.e.c	34.4	45.5	39.9	51.4	85.8	68.6
361	Furniture	79	61.7	70.3	23	86.8	54.9
369	Manufacturing n.e.c				21.7	97.9	59.8
371	Recycling of metal waste and scrap				7.6	103	55.4
372	Recycling of non-metal waste and scrap	37.9	24	30.9			

Source: As for Table 8.1.

Appendix Table 8.5 Vietnam most and least competitive segments

		INDO			MALAY		
ISIC	**Segment**	**1**	**2**	**3**	**1**	**2**	**3**
		Competitiveness indices (%)					
	The most competitive						
160	Tobacco	333	122	228	334	390	362
153	Grain mill	97.2	75.1	86.1	33.1	150	91.6
271	Basic iron and steel	49.7	112	80.6	43.7	151	97.4
293	Domestic appliances	277	109	193	44.6	190	117
332	Optical & photographic equipment	298	55.8	177	50.4	199	125
	The least competitive						
210	Paper	14	44.5	29.2	13.1	43	28
221	Publishing	55.2	18	36.6	18.7	32.5	25.6
311	Electric motors, generators	17.1	18.3	17.7	25	58.3	41.6
314	Accumulators	19.6	47.8	33.7	18.8	55.4	37.1
321	Electronic valves, tubes	13	21.8	17.4	13.1	97.2	55.1
331	Medical appliances	57.4	14.9	36.2	8.58	37.6	23.1
333	Watches, clock	34.1	14.9	24.5	8.02	18.1	24.5
341	Motor vehicle	12.9	38.9	25.9	51.5	115	83.2

Source: As for Table 8.1.

CHAPTER 9
VIETNAMESE GOVERNMENT POLICIES FOR STRENGTHENING MANUFACTURING COMPETITIVENESS: EVOLUTION, CHARACTERISTICS AND EFFECTIVENESS

9.1 Introduction

As is analysed in previous chapters, during the twenty-year period from 1986-2005 Vietnamese manufacturing underwent dramatic structural transformation, evident both in ownership and in industry structure. In line with such changes, various indicators of competitiveness at all levels – national, industry and firm – grew at relatively high rates, upgrading Vietnam's manufacturing competitiveness relative to comparable regional countries. This absolute and relative increase in competitiveness indicators was primarily attributed in the preceding analysis to corresponding changes in the market drivers of competitiveness. Over this period of time, Vietnamese governments designed and implemented numerous polices towards the renovation and development of the whole economy, and of manufacturing in particular. As a result, there arose debates about the role of government policies with regard to manufacturing competitiveness at all levels. The objectives of this chapter are to provide some answers to the following questions:

- What are the major goals and incentives of the government policies toward Vietnam's firms, industries and the whole manufacturing sector?
- How, and to what extent, did these policies evolve with respect to promoting Vietnam's manufacturing development?
- What are the striking characteristics of Vietnamese industrial policy in comparison with Japan, the first and the second NICs?
- Whether and to what extent Vietnam's government policies had an effect on upgrading manufacturing competitiveness?

These questions are addressed in the following three sections. Section 9.2 reviews the Vietnamese Government's policies at the systemic level, tracing the development of ten-year strategies and five-year plans, and providing a schematic outline of the evolution of key policies at the firm, industry and national levels. Section 9.3 describes the characteristics of those policies in various dimensions, including the policy-making process, the changing objectives and the types of policy measures used at different times. Section 9.4 provides a preliminary analysis of some empirical evidence about the effectiveness of those policies.

9.2 The evolving system of government policy for manufacturing development in Vietnam, 1986-2005

9.2.1 Socio-economic development ten-year strategies and five-year plans

9.2.1.1 Objectives and directions of socio-economic development for five years from 1986-1990

The severe socio-economic crisis in Vietnam prior to 1986 made the high-level leadership accept the lesson delivered from reality, that policy success would not be achieved merely by socialist doctrines and a number of good but simple initiatives. To transform good ideas into a better life for Vietnamese people, the VCP had to carry out socio-economic pilot programs and revise the socialist regime creatively, going beyond classic doctrines and drawing on the experiences of other ex-socialist, developing countries. In its sixth Congress in late 1986, the VCP promulgated some very critical changes in the strategy for building a socialist regime in Vietnam. For the first time since the nationalization of the private economy in the North in 1958, and in the South in 1976, a multi-ownership structure, including private capitalists, was not only permitted in Vietnam but was also recognized as necessary in the long term. Non-SOEs were given encouragement, which went from being assessed as an "accepted by-product of the socialist economy" to being a producer of nearly one half of society's total consumer goods. Nonetheless the establishment of non-publicly-owned enterprises was confined in manufacturing to consumer durable goods, and they were excluded from critical heavy industries.

With respect to priority industries, the 1986-1990 socio-economic plan continually emphasized the major shift in industrial orientation from heavy industry to the food and light goods industries which had been initiated in the five-year plan of 1981-1985. In addition, it was stressed that developing heavy industry in isolation from other economic sectors had to be abandoned. "From the initial steps, we combine the development of light industry with heavy industry to form a reasonable economic structure, ... leading heavy industry to essentially and effectively serve agriculture and light industry" (Political Report in VCP Congress 1986). Developing food and light industry was to be implemented through three major production programs, namely food, consumer goods such as textiles, garments, paper, pharmaceutical produce and electric fans, and exports. These industry targets were justified in part by the enormous post-war demand for these products above the prior very limited domestic production of them. In addition, the light industry group was assessed as a supplement to the development of several heavy industries, which in turn served as "the establishment of preconditions for intensifying industrialization in Vietnam in the next stage" (VCP, 1986). Those heavy industries consisted of energy, agricultural machinery, fertilizers, chemical petroleum, and materials including basic metals, rubber and cement necessary for reconstruction.

9.2.1.2 Strategy for economic and socio-economic stabilization and development, 1991-2000

The ten-year strategy for 1991-2000 reconfirmed three priority industry groups which mainly served the domestic market, comprising food, light consumer goods and agricultural machinery. Nonetheless, in the 1991-2000 strategy, for the first time in VCP socio-economic planning, serving the international market was determined as a new strategic direction for the selection of strategic industries. The stress on export-oriented manufacturing was primarily a response to the need to earn foreign currency after the loss of traditional international trading partners following the breakdown of the Soviet Union, and also a response to the need to enhance the manufacturing comparative advantage of Vietnam. It should be noted that Vietnam's industrialization strategy did not distinguish between export-promoting industries and those subject to protection against import competition. This was reflected by the direction taken that not only were consumer-good, labour-intensive industries encouraged to export, but also the machine parts, equipment and medium-tech industries were encouraged where possible.

Additionally, a modern high-technology industry, electronics, was initially selected as privileged in the 1991-2000 economic development strategy. Furthermore, the policy approach for developing this industry was not gradual but "directly going to the most modern technology", and not accepting simple, low-tech activities such as assembly. The implementation of such difficult tasks was to be achieved via the development of domestic technology capability and cooperation with foreigners.

The socio-economic development plan, 1996-2005

The program for developing industries outlined in the 1996-2005 economic development plan provided more detailed policy measures to develop light industries. The primary emphasis was placed on technology renovation within most enterprises in order to strongly develop light industries, especially by modernizing the textile industry and expanding paper production. Newly targeted industries, and relevant segments of them, were identified by this program as including petrochemicals (involving the construction of two new plants), all agricultural product-processing machines and equipment, automobiles, motorbikes and shipbuilding, which included manufacturing high-capacity motors and motors for large ships operating far from coastlines. To develop the electronics industry, the 1996-2001 plan also pointed to a more direct approach to modern technology, combining direct access to the industry's modern technologies and a gradual increase in the share of domestically manufactured electronic parts and accessories.

9.2.1.3 Strategy for economic and socio-economic stabilization and development, 2001-2010

The year 2001 witnessed a milestone in industrialization strategy in Vietnam, and marks a critical point of time for the planning of economic development and industrialization. The Political Report, approved by the IX VCP Congress in 2001, stated that the country would aim to escape from the low-income group by 2010 and to join the group of industrialized countries by 2020.

To achieve these critical objectives, the 2001-2010 economic strategy made further significant steps in outlining VCP industrial development strategy. These consisted of

using new criteria for selecting strategic industries as well as developing non-traditional policy measures. For the first time, "competitive advantage" was used as a basis for selecting strategic industries, providing some confusion relative to what was previously regarded as "comparative advantage". Additionally, output value was also replaced by value-added as a main indicator of industrial performance. In line with this new objective setting method, a number of fresh policy measures to achieve the strategic goals were introduced, such as building networks between large enterprises and SMEs, and developing linkages within the material processing industries. High-technology zones and free-trade zones were also introduced for the first time in this strategy.

2001-2005 socio-economic development plan and 2006-2010 directions

As suggested by its title, the first five-year plan of the 2001-2010 strategy did not differ greatly from the previous ones in both name and structure, and served to provide the concrete steps for the ten-year socio-economic strategy. However, the second plan, 2006-2010, marked fundamental changes by outlining the five-year economic and industrial development objectives with new preferred strategic industries or quantitative product targets as the objective of industrial development. These changes in strategy reflected further steps toward a market-based approach, and towards a more science-based method for making socio-economic plans and policy by Vietnamese politicians.

9.2.2 Policies toward firms-, industry- and national-level competitiveness

In the evolving strategic and planning context outlined above, the specific policies implemented by the Vietnamese Government have changed significantly over the two decades from 1986 to 2006. It is beyond the scope of this thesis to analyse these changing policies in detail, but the following four tables (Tables 9.1 to 9.4) provide a brief summary of the main policies and their evolution over the period, looking in turn at preferential policies for investment, firm-specific policies, industry-specific policies and more general policies directed at improving national manufacturing competitiveness. Then in Section 9.3 some of the main characteristics of these policies are analysed.

Table 9.1 Preferential treatments for new investment offered by laws and decrees on foreign and domestic investments

	Preferential treatment for new investment	***Specially preferential treatment for new investment***
Law, Decree on Foreign Investment (1987, 1990)	*Profit tax* exemption for 2 first years and reduction of 50% for next 2 years, tax rate deduction of 5-10%	*Profit tax* exemption for 4 first years and reduction of 50% for 4 next years, tax rate deduction of 11-15% relative
Law, Decree on Foreign Investment (1992), (1996)	*Profit tax* exemption for 2 first years since firm obtained profit and reduction of 50% for maximum 2 next years, tax rate deduction of 10%	*Profit tax* exemption for 4 first years and reduction of 50% of the next 4 years, rate deduction of 15%
Law, Decree on Foreign Investment *(2000)*	*Enterprise income tax:* Level 1: exemption for first year since firm made profit and reduction of 50% for maximum 2 next years, profit tax rate deduction of 5% for 10 years Level 2: exemption for 2 first years since firm obtained profit and reduction of 50% for maximum 3 next years, profit tax rate deduction of 10% for 12 years *Import tax* holiday for materials used for manufacturing export-good *VAT import tax*: exemption for equipments and machines used as fixed asset	*Enterprise income tax:* Level 1: exemption for 4 first years since firm made profit and reduction of 50% for maximum 4 next years, profit tax rate deduction of 10% for 12 years Level 2: exemption for 8 first years, profit tax rate deduction of 15% for 15
Law on Domestic Investment (1994)	*Tax Incentive:* Level 1: revenue tax reduction of 50% for 1 year since making profit, profit tax reduction of 50% for next 3 years or 4 years if enterprise met one or two requirements correspondingly. Level 2: revenue tax reduction of 50% for 4 year since making profit, profit tax reduction of 50% for next 7 years or 9 years if enterprise met one or two requirementss correspondingly. *Credit incentive:* Medium- or long-term loan provided or guaranteed by National Investment Assistance Fund	*Tax Incentive:* Level 1: revenue tax reduction of 50% for 2 years since having revenue, profit tax exemption of 3 first years since making profit and reduction of 50% for 3 or 4 next years if enterprise met one or two requirement correspondingly Level 2: Revenue tax reduction of 50% for 3 years since having revenue, profit tax exemption of 4 first years since making profit plus reduction of 50% for 5 or 7 next years if enterprise met one or two requirement correspondingly *Credit incentive:* Medium- or long-term loan at lower interest rate provided or guaranteed by National Investment Assistance Fund
Law and Decree on Domestic Investment (amendment, 1998)	*Land rent preferential:* State-owned land rent exemption or reduction of 50% *Enterprise income tax*: Level 1: exemption for 2 first years, reduction of 50% for 2 years, rate deduction of 7%. Level 2: exemption for 2 first years, reduction of 50% for next 4 years, rate deduction of 12%. *Credit incentive:* Medium- or long-term loan provided at interest rate partly subsided by National Investment Assistance Fund *Import tax*: exemption of 50% for machine, equipments used as fixed asset *Fixed asset depreciation incentive*: Shortened normal operating time of 50%	*Land rent:* free of charge if land provided by State; rent exemption for 5 years and reduction of 50% for 5 next years if rented from State. *Enterprise income tax:* exemption for 3-4 first years, reduction of 50% for 5-9 years, rate deduction of 17%.
Law, Decree on Investment (2005)	*Tax Incentive:* Level 1: Exemption for 3 first years, reduction of 50% for 5 years, rate deduction of 17%. Level 2: Exemption for 3 first years, reduction of 50% for 7 years, rate deduction of 17%.	

Source : Author's summarization based on reference documents.

Table 9.2 The goal, measures and subjects of firm-level policies

Policy goals	Policy measures and subjects
1986-1991	
Supply-side	
• **SOEs:** Increase of state-owned capital efficiency.	• Reformed government-firm relationship: gradually reduced government subsidies and number of performance indicators imposed on SOEs from 11 to 5; expanded both autonomy and responsibility of enterprise managers, local government was transferred the power to decide establishing of local firms.
Non-SOEs	
• Mobilizing non-state-owned resources for manufacturing consumer commodities	• Non-SOEs were permitted to operate in virtual manufacturing industries.
FIEs	
• Attracting FIEs to absorb the package of capital, technology, marketing skills and customer network.	• *Law and Decree on Foreign Investment (1986,1990)* *Preferential tax treatments level 1:* provided if firm meet two of these conditions: had capital of minimum 8 millions $US; obtained average-below profit ratio; invested in first five years of Law on Foreign Investment; export at least 80% products. *Special preferential treatments:* if firm met two of above conditions and located in areas with very difficult conditions or remote areas or had very low profit ratio.
• **Smallest non-SOEs**: To relieve difficulties caused by diseconomy of scale.	• *Law on Profit Tax.*: Progressive profit tax rate deduction of 18% for the smallest profit production unit compared to the rate imposed on the largest.
1991-1996	
Supply-side	
• **SOEs**: Increase of efficiency and competitiveness by restructure.	• *Organization restructure*: - In part privatisation of a limited number of SOEs; sale and closure of loss-making SOEs. - *1994 Government decision No. 90-91:* merge of most SOEs operating in an industry to establish State-owned General Corporation (90-91GCs), were given more autonomy GC than other SOEs; new SOEs were only allowed to establish in an industry where non-SOEs are not capable to invest.
• **Domestic enterprises** Encouragement of new Vietnamese-owned investments and enterprises to mobilize more domestic business sources	• *Law and Decree on Domestic Investment (1994)* *Preferential treatment:* granted if new firm used modern technology or - located in mountain or island areas stated in List B *Special preferential treatment:* if new firm located in areas where circumstances for living and doing business were very hard, stated in List C.
• **FIEs**: To continue attracting more FDI on manufacturing via larger, higher-tech projects	• *Law and Decree on Foreign Investment (1992, 1996):* Preferential treatment provided if firm uses high technology or invest on R &D activities, or export 50% products; Special preferential treatment if firm located in industry zone, export 80%
• **SMEs**	• *Law on Profit Tax (1990):* exemption and the lowest revenue tax rate for small family unit.
• **LEs**	• *Law and Decree on Domestic Investment (1994):* Preferential treatment provided if new domestic enterprise employed at least 300 employees in cities or 200 employees in other areas; Special preferential treatment for FIE employed at least 500 labours. *Trading right permission:* the conditions imposed on enterprises registering export, import activities had been eased since 1989, reduced from 5 conditions in 1992.
Demand-side	*Law on Import and Export Duties:* preferential rates of 50% applied for good imported/exported from the countries signing the trade agreement with Vietnam.

Policy goals	Policy measures and subjects
2006 onward	
• **All enterprises**	• *Law and Decree on Investment (2005):* Applied similar investment preferential to local and foreign firms. *Preferential tax treatment* if firm use at least 25% of total revenue on R &D and met one of preferential industry, infrastructure conditions. *Special preferential investment* offered to firm use of high technology and met one of industry-based preferential conditions
• **SMEs**	• Government initial *comprehensive program* supporting SMEs in training employees, design and pilot of new products, R & D activities.
• **LEs**	• *Special preferential treatment:* offered to firm employing more than 5000 employees.

Source: As for Table 9.1.

Table 9.3 Goal, measures and subjects of industry-level policies

Policy goals	Policy measures and subjects
Supply-side	
1986 – 1996	
• Encouragement of *export-oriented industries* and promotion, protection of *import-substitution industries*	• *Law on Foreign Investment, (1986, 1990): Preferential treatment*: given to an FIE investing on essential import-substitution industries or export at least 80% of products and meet one of the other five conditions
• To boost the development of priority industries including both groups: basic-, export-oriented and intermediate-, capital-good, import-substituted.	• *Law on Domestic Investment (1994): Preferential tax and credit*: if new project expanded or established export-processing plant or invested on any of priority import-substituting industries. *Special preferential tax and credit*: level 1 offered if new project located in very hard areas, level 2 if invested on priority industries and located in remote, island.
1997-2005	• *Law on Foreign Investment (amended 1992, 1996): Investment preferential* provided if new foreign-owned projects invested on the priority industries; level 2 provided new foreign-owned projects invested on most priority industries.
• Development of numerous priority industries. (Box 3)	*Local requirement:* given for motorbike, electronic, conditioned at least 30% of commodity's value was domestically manufactured.
Demand-side	• *Law on Domestic Investment (amended, 1998): Special preferential treatment*: if firm manufactured export-oriented or import-substituted goods or invested in any priority manufacturing industries or new firm or projects export at least 80% of product, or processed and exported at least 50%, agriculture product or invested on high technology industries or created new materials.
1986-1996	
• Protection and development of import-substitution industries	
1996-2005	• *Tariff* was initiated since 1988, ranging 0% to 60% and covering 130 commodities. The highest rate imposed on tobacco, car and the good domestically manufactured.
• Reducing protection of a number of import substitution segments	*Quantitative control:* introduced since 1994 with the number of commodities restrained import changed from 5 to 8.
	• *Tariff:* reduction tax map following CEFT under ASEAN free trade agreements (FTA), almost tax lines (except the excluded list) reduced to 20% by 2003, to 0-5% by 2005, Vietnam-US trade agreement, WTO in 2006
2006 onwards	
• Accelerating the development of a larger number of priority industries most of which were intermediate-, capital-good, higher-technology ; continuously reducing protection of substitution industries	• *Law, Decree on Investment (2005): Preferential* treatment: offered to any enterprise investing in a priority industry which includes virtually manufacturing industries. *Special incentives*: offered if firm invested on the most encouraged manufacturing industries: composite material, high-standard steel and other metals, computer, electronic appliances, precise mechanics.
	Import tax exemption for 5 years on materials to produce mechanic goods or electronic or other priority industries' devices and components that were not produced in Vietnam
	Long-term large credit of over 700 millions US $ from international financial companies in 2006, guaranteed by government, was given to VINASIN (Vietnam Shipping GCs) for accelerating the development of ship-building.
	Excluded all preferential investment for export-oriented, labour-intensive industries.

Source: As for Table 9.1.

Table 9.4 Goal, measures and subjects of national-level policies

Policy goals	Policy measures and subjects
Supply-side	
1992-2005	
• Developing all components of infrastructure and export-processing, industrial, high-technology zones	• *Law on Foreign Investment (amendment 1992, 1996, 2000): Preferential treatment* granted if firm located in export-processing zones or in high-technology zones, level 3 provided if firms invested on constructing infrastructure. *Special incentives:* granted if invested on construction of infrastructure in remote or difficult area. *Import tax exemption* for goods produced in these zones • *Law on Domestic Investment (1994, amendment 1998): Preferential treatment* provided if firms invested on construction of infrastructure: electricity plants, road, ports, rails, telecommunications... or located in export-processing zones, high-technology zones, industrial zones or invested on construction of these zones. *Special incentives:* offered if firm invested on these construction activities in remote, hard-working areas.
• Encouragement and support of innovation and development of key industry-wide technologies	• Government Decree No. 122/2003 to establish *National Foundation for Science and Technology Development:* credit with zero or very low interest rate for any R&D project resulting in large impact on national economy.
2006 onward	• *Law, Decree on Investment (2005)*
• Encouragement of construction and formation of export-process zones	*Preferential Investment conditions* granted to enterprises invested in industrial zone established by Prime Ministerial decision.
• Support training in enterprises	• Cost of training incurred in enterprises would be included in total reasonable production cost based on which income tax would be accounted.

Source: As for Table 9.1.

9.3 The characteristics of policies toward manufacturing competitiveness in Vietnam

9.3.1 The political economy of policy-making

The policy-making process of every government depends substantially on the characteristics of the country's historical context and political system. Firtsly, the key characteristic of the decision-making process in Vietnam has been the traditionally strong and relatively profound influences of the leadership of the VCP. The open policy and economic reform since 1986 induced a multi-ownership economic regime, greater autonomy of the Parliament and more freedom of speech in Vietnamese society, but politics was still dominated by the one-party leadership. As stated in the first part of this thesis, every five years the VCP Congress determined ten-year socio-economic development strategies and five-year plans which established the most important policy

objectives and measures. In addition, the meetings of the members of the Party Central Committee normally take place every six months, providing more detailed guidance for critical issues as necessary, and addressing further matters that have emerged between the two Congresses.

It should be noted that all VCP economic documents, including the section of the Political Report devoted to economic issues, national strategies and plans, were prepared by specialised groups of experts, most of whom were recommended from the largest research institutions such as the Vietnamese Social Sciences Academy and the Vietnam Economic Strategy Institution. Nonetheless, the main ideas had been initiated, discussed and more importantly decided at a Party Congress or a Central Committee meeting. In addition, the economic and industrial strategic directions of the Party would be legalized and given concrete form via a system of laws enacted by members of Parliament, most of whom were members of the VCP and therefore had to follow the Party's directions.

Secondly, the procedure of making laws and relevant detailed policies still substantially depends on government preparations, despite an increased participation of people in general and of business in particular. The role of parliamentary members in representing different opinions and benefits of different groups of citizens in the process of making and implementing laws, via scrutiny and counter-arguments, has gradually increased since 2001. Nonetheless the ratio of professional members of Parliament to the total remained small, and most of laws are still mainly prepared by a relevant ministry. Consequently, in the majority of cases, the preliminary contents of drafts prepared by a specialised ministry would merely be added or changed slightly. Such inadequate counter-arguments may have led to benefits being biased to rent-seeking groups and may have limited the effectiveness of policy.

In addition, in order to be actually applied, each law needs to be concretely expressed in policies contained in a relevant government Decree (Nghi dinh), signed by the Prime Minister. The implementation of each Decree would be further based on a set of instructions (Thong tu), normally issued and signed by Deputy Ministers. These translation processes, especially the latter, may provide opportunities for leaks or for the addition of policy incentives and other changes which may be inconsistent with the

corresponding Law or Decree, but which are beneficial to certain groups of bureaucrats and rent-seekers. Furthermore, individual or joint ministries were given authority to issue regulations relatively independently from the laws and decrees, therefore providing greater opportunities to shape the detail of decrees and the policy incentives.

Thirdly, the policy-making power of the Government is highly concentrated in the Ministry of Planning and Investment (MPI), the Ministry of Finance (MOF) and the Government Office of Prime Minister and Cabinet (PMC). The MPI is responsible for preparing drafts of all Laws and Decrees on both domestic and foreign investment, based primarily on VCP socio-economic directions as well as on a synthesis of policy opinions and proposals from other individual ministries. The MOF is in charge of providing more detailed advice on the type and extent of financial preferential treatment. The PMC assists government leaders more in administrative tasks rather than in policy-making, and its power differs significantly from that of the Blue House in South Korea.

Unlike their counterparts in Korea or Malaysia, the Ministry of Industry and the Ministry of Trade in Vietnam play a moderate role in industrial policy decisions. The Ministry of Industry includes the Institution for Industrial Development Strategy and Policy, which assist the government in outlining development strategies for individual manufacturing industries, regions and even provinces. But, despite being signed by government leaders, these policy proposals were only recommendations rather than decisions and regulations. Their implementation, and hence their impact on developing industries, thereby remained very limited. The recent merger of two of these ministries to create the Ministry of Industry and Trade (MIT) in 2007 reflected another attempt by the Vietnamese government to apply more effectively the lessons from Japan and other NICs in enhancing the role of MIT in industrial policy making.

The role of the Chamber of Commerce and Industry as the bridge between government and business has been strengthened, mainly through organizing an Enterprises Forum in which the Prime Minister directly receives information from, and has discussions with, entrepreneurs about the barriers facing business at a given time and the best methods to overcome them. Professional industrial associations, such as those for textiles and garments, steel and automobile have grown and contributed more on policy responses

and adjustments. However, overall, industrial policy decisions in Vietnam, especially prior to the Tenth Party Congress in 2006, were determined more politically than technologically, as had occurred in the first generation of NICs during their industrialization.

9.3.2 The policy approaches and objectives

The policy approaches adopted in Vietnam can be viewed as diversified in many dimensions: as having gradual or immediate effect; as explicit measures of the 'command and control' type or as implicit measures relying on prices and incentives; as supply-side or demand-side; and as targeted to some or all of three levels – firm, industry and national. The explicit approach was applied for the SOEs and, to some degree, to specific industries, using a combination of organizational, administrative and financial tools. In contrast, the implicit approach was taken towards the non-SOEs, in the form of encouraging domestic investment and SMEs development by financial instruments, support for strengthening production factors and administration processes. Such methods proved appropriate to overcome persistent prejudices towards, and discriminatory treatment of, private enterprises economy, and to create an equal competitive environment for all firm types.

The gradual approach was applied for changes in firm ownership type and industry structure, with the policy objectives shifting over time from being discriminative or selective to becoming more broadly based or functional. In the initial years of economic reform, the policy for reforming the SOEs started by reducing government subsidies and incrementally increasing the enterprise's autonomy as well as its efficiency. In the next period, the policy emphasis was placed on the foundational role of SOEs to accelerate the development of import-substituting, medium-high and high-technology industries. For non-SOEs, the policy goals evolved from reducing discrimination and leveling the playing field to promoting this firm type as an important channel for providing employment and mobilizing domestic capital. Most recently, non-SOEs had been encouraged to play a more essential and important role in developing most industries, including medium-high technology ones.

Policy objectives toward FIEs started with a focus on attracting large amounts of capital and competitive technologies, as well as developing export capability, but evolved to stressing the potential contribution of FIEs to increasing employment and reducing regional disparities. From 2005 onwards, as was indicated in the Table 9.1, objectives for FIEs have been more oriented to the development of high-tech industries but those have not yet developed in Vietnam.

It should also be noted that, due to the traditional emphasis by the VCP on social equality objectives, the economic and manufacturing goals, typically those related to developing medium and high-technology industries, usually went in line with social objectives, mainly those of creating employment and reducing inequalities in regional development. These social objectives were expressed by specially preferential treatments, or higher rates of incentive, being given to new firms or projects that propose to locate in remote or deprived areas. This practice of combining social and economic goals was likely to hinder the implementation of manufacturing policy, or even cause adverse outcomes, because of the unavoidable trade-off between social and economic objectives and corresponding business decisions.

9.3.3 The policy measures

With the advance of economic reform and industrial development, the concrete policy measures, especially on the supply-side, become more diverse. Firm-level policy measures can be categorised into organizational, administrative and financial measures, which in turn can be grouped as targeting SOEs, non-SOEs and FIEs (see Table 9.2). The policies for strengthening SOEs did not simply consist of the standard privatization menu, but included a package of instruments ranging from closing the loss-making enterprises, selling or leasing the small and low efficiency one, equitization of the whole or a part of ownership to merging small and medium enterprises. Another important measure was establishing General Corporations, most of which were diversified in term of industry, and expanding them to "big giant" (tap doan). In addition, the GCs members did not simply remain state-owned firms but their ownership had been reformed to different types such as partly or completely equitized, limited one-member company (SOCs). The relationships between a GC's headquarters office and its members evolved from applying largely administrative control to being more

supportive, especially in terms of finance. The former and the latter were thereby respectively termed "mother and sun".

The policy devices used to promote non-SOEs and to encourage FIEs ranged from different degrees of tax incentives – conditional on the firm meeting one of the following conditions, using modern technology, employing a large number of workers, together with locating in remote or mountain areas, and export credit support. The other major policy tool is credit in the forms of government guarantees, for firm borrowing from banks or state-owned banks, to provide low-interest rate loans to support firms in the simplification of administration procedures and the cost of establishing or to support firm in training labour and conduct of R&D.

The industry-specific policy tools (see Table 9.3) also comprised those for stimulating export-oriented industries and protecting import-substituting ones. The former in turn included supply-side devices such as land rent concessions, tax reductions, credit support via National Investment Assistant Fund, depending on the level of exports, and on the demand-side included slightly increasing the exchange rate, export tax exemption and rewards for achieving large export levels. The supply-side tools also included local content requirements, tax holidays and preferential credit provision to strategic industries undertaking import substitution. The demand-side devices consisted of quotas and high tariffs imposed on competitive products.

The policy objectives and measures used showed the attempts made by the Vietnamese Government, as a latecomer, to learn from and apply the successful government policies for rapid industrialization adopted in East Asia and specifically in the first generation of NICs, mainly South Korea, Singapore and Taiwan. Vietnam pursued similar industrial policy objectives to these countries including the combination of encouraging export-oriented industries and protecting import-substituting ones, developing large domestic enterprises to become national champions, attracting FIEs to bring in modern technology, and so on. However, Vietnam's industrial development policies measures shared more common features with their counterparts in the second generation NICs – Malaysia, Thailand and Indonesia – than in the first generation NICS. Common features included heavy reliance on FDI, lack of effective tools to intensify learning and limited attention to upgrading indigenous technology capacity. The industrial policy menus

adopted in Vietnam, as well as the industrialization goals and measures directed by the VCP, show a number of shortcomings compared to those of the East Asian tigers in the comparable period of their development.

Firstly, the industrial policy goal setting method was mostly still based on the traditional methods applied in the centrally-planned, closed economy. For one thing, whereas the VCP 2001-2010 socio-economic strategy and the 2006-2010 five-year direction, used value-added as the main indicator of industrial and manufacturing development, the annual government reports and statistics for each industry still used the main backward indicators, such as output value, export output value and even the number of each type of products produced. These indicators are very large figures according to which an industry or the whole manufacturing sector results appear very large. Nevertheless these normally included a very great proportion of imported input value including depreciation of machine and material, and merely just possibly a small amount of value-added. The output or export indicator therefore does not reflect the actual productivity performance levels or achievement of industry, the state of the economy and the effectiveness of government leading.

In addition, subjective opinions and political purposes still played a considerable role in the selections of strategic industries and of the technology level for each industry. The key scientific laws on industrial development, such as the interaction of backward and forward industrial linkages, and the need for incremental upgrading of indigenous technology capability over time, had not yet been well researched and were not respected. The main policy targets therefore normally fell into two extremes: labour-intensive, low-technology basic goods or high-tech industries producing capital-intensive goods, with electronics being a typical symbol of "going directly to modern technology".

Secondly, the policy goals were broad and tended to be extreme, with either very high or very low standards compared to the actual state of Vietnam's manufacturing development degrees at all levels and in each period. A typical and important case involved technology policy. Acquiring and using modern technology was emphasized as the highest priority policy goal, being offered preferential treatment from the passage of the first laws on both foreign and domestic investments. In the first five or ten years,

the technology policy emphasis was still placed more on using technology appropriately and directly using technology to achieve the manufacture of competitive products. Nonetheless during the next ten years (1994-2004), indigenous technology upgrading goals were expressed in very general terms and were much more advanced than the realistic capability of enterprises locating in Vietnam would permit.

The policy goal of training labour skills emphasized quantity of students and colleges and the level of degrees, especially at the post-graduate level, rather than the quality of the courses, the provision of essential practical skills and of a reasonable proportion of technical students. Consequently, the number of new, part-time students attending law, business and management courses increased rapidly while those in TAFE and technical departments increased at a significantly slower pace.

The industrial policy targets were also very broad, with very few separate laws or decrees for an individual firm type or industry. By comparison, in South Korea or Malaysia the development of each strategic industry was specifically shaped by an act or law, such as the *Machinery Industry Promotion Act*, the *Electronic Industry Promotion Law* in 1967 and the *Heavy and Chemical Industries Act* in 1973 in Korea.

At firm-level, the specified important tasks, such as expanding and strengthening state-owned GCs, were not linked into concrete performance-based criteria, such as the rate of locally manufactured value or of high-technology export value, as performance conditions to receive further higher autonomy and continued financial government assistance. The policy objective of encouraging FIEs to invest in high-technology and high-tech support industries showed the subjective expectations of the host government, based on the generally higher technology capacity of FIEs, but did not take adequately into account the global business and technology strategies of MNCs and the reality of the skills and technical capability of local engineers and other employees.

These shortcomings in the design of policy goals led in part to certain corresponding limitations in the policy measures. Firstly, the overall policy measures were less diversified than those applied in the first generation NICs, particularly with respect to the intensity of technology upgrading and the creation of new comparative advantages. As pointed in the previous part, financial incentives via profit or enterprise income tax

and tariffs served as the main type of tool. The role of credit, via domestic banks and the National Investment Support Fund (which was later transformed into the Development Bank), remained limited, and was provided chiefly for export rather than for the expansion of the scale of production, for technology renovation, or for R&D conduct in locally-owned enterprises, even state-owned GCs. The organization solutions were focused in large part on the SOEs and to a smaller degree on the creation of joint-ventures between SOE and FIE. Nonetheless, there was still a lack of effective policy tools for the establishment of linkages between firms, universities and research institutions and even firm members within a GC. Fortunately these directions were stated in the last five-year socio-economic plan.

Secondly, policy measures for upgrading indigenous technology capability were not adequate to intensify these important activities and build the future competitiveness of enterprises. The measures were applied via tax provisions and partly through credit measures but only to a very limited degree, as is reflected in the very small percentage of enterprises conducting R&D. There was also a lack of sophisticated policy devices to promote various forms and levels of technology transfer, such as purchasing licenses, use of foreign experts as consultants, and linkages between universities and research enterprises. Where local content requirements applied, before WTO entry and commitment, they were conditional merely upon a certain percentage of value being domestically produced, not specifically on a requirement for producing higher-tech, higher-value added components and parts. Nor was the offer of relevant tax incentives accompanied by the imposition of a corresponding fine if the enterprise did not accomplish the set tasks. As a result the effects of these policies on the development of medium-high tech were likely to be limited. Likewise, the policy incentives to stimulate firms carrying out relating R&D remained modest.

Thirdly, there were still not sufficiently effective policy measures to encourage and ensure teaching quality, especially at universities and technical colleges. Setting criteria for assessing training quality occurred later than the pursuit of quantity-based growth, and did not demonstrate integration to international standards. English language training was clearly not adequate for technicians to be able to actually communicate their work in English.

Given the analysis above of the conditions for receiving special priority treatment from government, it is most likely that enterprises would choose to invest in labour-intensive, low-technology and export-oriented industries or stages in the global manufacturing value-added chain. The policies allowed them to utilize efficiently a pool of cheap labour rather than make efforts to apply new, advanced technologies. The latter has proved difficult, costly and risky in developing countries, and the experience of the first-NICs suggests that comprehensive, effective government policy measures are required. This trend is particularly evident in the case of fully foreign FIEs which, as shown in Chapter 7, have increasingly focused on labour intensive industries and had labour productivity levels below the national manufacturing average in 2005, as a result of only limited growth in productivity between 2000 and 2005.

9.4 The effectiveness of policy toward manufacturing competitiveness in Vietnam

As noted above, and as brought out clearly in Tables 9.2-9.4, Vietnam has implemented a wide range of evolving policies towards increasing manufacturing competitiveness over the past two decades. The full evaluation of their effectiveness is a major task, beyond the scope of this thesis. In this final section three specific tests are undertaken, to throw light on the effectiveness of selected policies. In Section 9.4.1 we examine the evidence concerning government corporations (GCs), which was a key policy to strengthening the performance of SOEs. In Section 9.4.2 a panel data regression using pooled data, across 21 industries for 2000 and 2005, is used to investigate the impact of tax and tariff policy measures on industry performance.

9.4.1 Firm-level policy for strengthening state-owned general corporations

The merger of a number of SOEs to establish larger GCs was seen by the Vietnamese Government as a fundamental industrial policy to strengthen SOE performance and to enhance the pioneering role of SOEs in economic and industrial development. By 2005, a GC had on average about 2000 employees and all GCs held around one-quarter of the total capital of SOEs within the manufacturing sector (GSO 2005). To examine whether this restructuring of SOEs led to stronger competitiveness in GCs, two major approaches are possible. The first undertakes correlation and regression analysis of quantitative data, both on the organizational characteristics in which the GCs are

supposedly better (such as higher autonomy in making decisions) and on key business performance measures such as the profit-turnover ratio.

The second potential assessment method undertakes an empirical analysis of competitiveness indices for GCs and other forms of firm ownerships, especially central SOEs that operate at a similar time. Given similar levels of market production factors, differences of trends of competitiveness indices between GCs and central SOEs and other groups may provide an indication of the effectiveness of government policy toward SOEs and GCs. Given that quantitative data on GC organization characteristics and performance measures are not generally available, this second method is used here.

Table 9.5 Competitiveness indices of various firm ownership types relative to GCs, 2002 and 2005, (GC value = 100 for each year)

	Value/ employee		Value/ wage		Value/ capital		Value/ total cost		TFP	
Enterprise types	2002	2005	2002	2005	2002	2005	2002	2005	2002	2005
GCs	100	100	100	100	100	100	100	100	100	100
Central SOEs	53	72	68	89	73	66	66	111	84	98
Local SOEs	49	64	90	238	92	117	91	183	86	103
SOEs	**50**	**67**	**81**	**135**	**84**	**104**	**81**	**145**	**85**	**101**
Collective	14	30	58	118	176	267	81	183	78	98
Private	39	48	141	154	116	154	75	135	79	92
Private limited	47	74	147	190	107	133	85	148	88	102
Joint-stock 1	48	113	78	154	109	117	84	136	90	101
Joint-stock 2	41	109	117	151	101	142	75	138	87	110
Non-SOEs	**40**	**72**	**131**	**172**	**117**	**143**	**80**	**145**	**83**	**99**
Wholly FIEs	59	107	51	120	59	93	55	132	83	100
Joint-venture	246	578	170	310	73	130	60	142	110	125
Joint-venture with private	95	143	79	160	54	91	48	109	80	101
FIEs	**113**	**180**	**82**	**152**	**62**	**99**	**56**	**132**	**90**	**104**

Source: As for Table 6.1.

Table 9.5 shows the performance figures of a number of enterprises including GCs, accounting for about 60 percent of total of all GCs in Vietnam, drawn from the survey of 3200 firms in each year 2002 and 2005. It is also noted that, in order to obtain comparable results in terms of firm type averages, tobacco enterprises were excluded from the two samples, since they were virtually all SOEs and had a very high ratio of value-added to other input variables. In 2002, GCs had higher values than virtually any other firm ownership type, except joint-venture FIEs involving SOEs, for most competitiveness indices. In particular, this is true for value-added per employee, value-

added per unit of total cost and TFP. GCs only had lower capital productivity in 2002 than all non-SOE ownership types (perhaps reflecting a concentration in more capital intensive industries), but also had lower cost efficiency (value-added per wage unit) than most types of non-SOE.

Table 9.6 Annual growth rates of various firm ownership types relative to GCs, 2002 and 2005, (GC value = 100 for each year)

Enterprise types	Annual growth rates, 2002-05 (% per annum)				
	Value added per employee	Value/ wage	Value/ capital	Value/ total cost	TFP
GCs	-1.7	-5.6	-5.4	-12.0	-6.4
Central SOEs	9.5	2.7	-7.9	1.9	-1.8
Local SOEs	8.3	39.9	2.3	8.9	-1.0
SOEs	**8.5**	**12.8**	**1.0**	**4.1**	**-1.4**
Collective	34.0	23.3	9.0	13.9	0.5
Private	4.8	-3.0	3.5	4.6	-2.0
Private limited	16.8	2.5	1.2	3.3	-2.3
Joint-stock 1	41.2	21.2	-3.2	0.6	-2.9
Joint-stock 2	51.3	2.7	6.0	5.2	1.0
Non-SOEs	**22.8**	**3.0**	**0.7**	**4.7**	**-1.2**
Wholly FIEs	23.9	31.8	10.6	17.4	-1.1
Joint-venture	40.9	17.3	16.5	16.4	-2.6
Joint-venture with private	14.6	22.8	13.8	14.1	0.4
FIEs	**17.0**	**17.9**	**10.9**	**16.2**	**-2.5**

Source: As for Table 6.1.

However, in 2005, the results were substantially reversed, with competitiveness values higher than for GCs for most other ownership types and most indicators. The main exception is labour productivity, but even here there has been since 2002 a sharp increase in labour productivity in all ownership types relative to that of GCs. This is directly explained, as pointed out in Table 9.6, by the absolute reduction for GCs in all competitiveness measures, including labour productivity, between 2002 and 2005, at a time for which these indicators (other than TFP) were rising strongly for most other firm types. While only for a limited period, these trends suggest that the Government's GC policy is not achieving its goals and this may be partly due to the limitations of government policy instruments and of their likely effectiveness, as analysed earlier.

These disappointing trends in the competitiveness indices for GCs are similar to those found from several surveys and reports on GCs prepared by JICA (2000) and the World Bank (2005). Nonetheless, the relatively high indices of limited one-member central

state-owned companies (SOCs) most of which transformed from large central SOEs, suggested other more effective policy measures to restructure and build up large SOEs to become strong, leading enterprises.

9.4.2 Industry-wide policy impacts

As discussed in detail earlier in this chapter, a major focus of the policies of the Vietnamese Government has been to encourage the growth of domestic non-SOE firms and to attract substantial investment in the country by foreign firms. Two of the main measures that have been used to that end have been variations in enterprise income tax rates and tariffs. In this section we use econometric methods to test whether there is an evidence of these variables on key competitiveness variables for non-SOEs and FIEs.

As noted in Chapter 5, in neoclassical growth models of the Solow-Swan type, the long-run steady state of GDP per capita is a function only of the level of technology, broadly defined, and not of the rate of growth of capital stock or labour supply. But, for a given country with output per capita levels far from its steady state, such as Vietnam, it is likely to take a long while to achieve that steady state level. If technology or policy changes lead to an increase in the steady state level of output per capita, this will lead to an increase in the transitional rate of growth towards the new steady state. Thus models have been developed in this framework (e.g. Lee 1996; Barro and Sala-i-Martin 1991, cited in Wagner and Ark 1996) in which the rate of growth of a developing country (one far from its steady state) is related, positively, to variables generating a higher steady state level and, negatively, to the opening level of the relevant state variables, such as output per worker or capital stock per worker. This latter negative relationship reflects diminishing returns to growth, so that the higher the opening levels the lower the rate of growth towards the new steady state.

This approach is used here to examine the influences of government policies in the form of enterprise income taxes at the firm level for the whole manufacturing sector. A slightly modified model initiated by Lee (1996) was used, with the following specification:

$Y_{it} = \beta_{it} + \gamma X_{it} + \phi Z_{it} - U_{it}$, where

Y_{it} : labour productivity growth of firm *i* in year *t*

X_{it}: a set of initial levels of state variable for each firm (labour productivity measured by value-added per employee and capital stock measured by fixed capital per employee in that year)

Z_{it}: a set of policy variables, here the enterprise income tax levels applying for firm *i* in year *t*

U_{it}: a disturbance term.

The data for both the state variables and the policy variable were calculated from the UNIDO statistics in 2000 and two accessed surveys of more than 3000 firms in year 2002 and 2005 as stated in Chapter 5. Data for credit incentives and tariffs were not available, so only one policy variable was used here.

The impact of government policy toward industry *i* is centrally assessed via the influence of enterprise income tax incentives, which were the most prominent policy measures to boost the investment of these enterprises as stated earlier. It is hypothesised that, income tax preferential had positive impact on both non-SOEs and FIEs competitiveness indices and to a greater degree for the latter. Four state variables are used as below:

LNF: logarithm of fixed-capital per employee in the initial year of each two-digit industry, and

LNV: logarithm of value-added per employee in the initial year of each industry

TAX: the ratio of difference between payable enterprise income tax and the normal rate for enterprises within each industry

TARIFF: the effective rate of protection for each industry; the estimation is carried out on a pooled data set for the years 2002 and 2005, with data for 21 industries for each year

The results are presented in Table 9.7.

Table 9.7 Pooled regression of tax and tariff impacts on labour productivity

Dependent variable is growth rate of value-added per an employee

Independent variable	(I) Coeff.	t.	(II) Coeff.	t.	(III) Coeff.	t.
C	-0.38	-1	-0.43	-1.3	0.26	3.52
LNF	0.38	5.27	0.369	5.37	0.4	9.33
LNV	-0.47	-4.7	-0.48	-4.8	-0.44	-4.9
FG	0.06	2.86	0.059	2.92	0.04	2.24
TAX	1.45	1.53	1.593	1.86		
TARIFF	-0.04	-0.2			-0.32	-1.93
Observations	42		42		42	
Method	WLS		WLS		WLS	
$\overline{R^2}$	0.73		0.735		0.78	

Notes: Data of 21 two-digit industries, pooled 2000 and 2005.
Weighted least square method was used to control industry-specific effect.

As shown in Table 9.7, labour productivity growth was substantially affected by enterprise income tax subsidy, whether this policy measures' impact was taken together with (I) or separate from tariff effect (II). However, the influence in the former case was less significant than the latter. In contrast, tariff had negative impact on the increase of value-added amount created by an employee in both mentioned cases. The tariff effect was also insignificant when it was included with that of enterprise income tax.

These positive and negative impacts of tax and tariff policy on value-added per employee shown here for Vietnam, are relatively similar to those arising from the regression model initiated and employed for the case of Korea by Lee (1996). While these results are only for a limited period, 2002-05, the significant coefficients for the tax variable support continued implementation by government of enterprise income tax policy, whose strong influence on production resource allocation and positive impact on labour productivity was evident. But, in addition, the results also suggest that a substantial review of the tariff schemes is essential, since this protection policy has been argued to be a factor causing less competition, supporting inefficient plants and creating permanent infant industries. However, compared to the full time-series data requirement for assessing productivity trends and policy impacts as stated in the previous parts, the data used in this regression were very limited. Accordingly, the policy impact results of this regression still needed to be cautiously interpreted for the evaluation of Vietnamese

government policy as well as for reviewing and making changes in the selection of policies, goals and corresponding measures.

9.5 Conclusion

Since the economic reform started in 1986, the political system and the Vietnamese Government have made fundamental changes in approaches and methods of outlining industrialization strategy and making industrial policies. At national and industry levels these consisted of combining the promotion of the export-oriented industries and the protection of the selected import-substituted industries. At the firm level, the plans and programs aimed at attracting FIEs, encouraging new locally-owned firms as well as restructuring and strengthening SOEs. Whereas the policy-making procedure had been still largely influenced by government bureaucrats, the participation of different groups of people, entrepreneurs via Parliament, the Chamber of Commerce and Industry and professional associations has also been increased.

The Vietnam government set numerous detailed policy tasks and instruments to achieve the industrialization goals outlined by the VCP in each period of time. These policies evolved from being discriminate and specific to being more equal and functional. The policy approaches, goals and instruments targeting different types of firm ownerships became demonstratbly relatively diverse, being more responsive to the needs of each type of firm. As a result, the policies had considerable effectiveness in encouraging FIEs to export, in encouraging non-SOEs to increase employment, to utilize domestic capital and to increase production of various manufacturing commodities. Our initial empirical analysis suggested that incentives provided through enterprise income tax had a strong positive impact, but that tariff policy seemed to be ineffective.

In spite of these successes, there existed a number of impediments in the policy-making mechanisms, which in turn were not capable of solving several challenges in manufacturing development. Despite numerous measures implemented over a relatively long time to raise efficiency in and strengthen SOEs, these enterprises, and especially GCs, still performed below expectations. In addition, policy did not succeed in inducing FIEs to invest more on higher technology activities, with the increased FIEs activity – most of their labour and nearly a half of their capital – being in labour-intensive, low-

technology industries. Those operating in medium and high technology industries were still largely in the low value-added, assembly stage of the MNCs global chain. This helps to explain why the labour productivity gap between Vietnam and the second generation NICs had not been significantly reduced, and has even widened in several high-tech industries.

The analysis above of the conditions for receiving special priority treatment from the government implied that it is most likely that enterprises would choose to invest in the labour-intensive, low-technology and export-oriented industries or stages in the global manufacturing value-added chain. The policies allowed them to utilize efficiently a pool of cheap labour rather than making efforts to apply new, advanced technologies. The latter has proved difficult, costly and risky in developing countries, and the experience of the first-NICs suggests that comprehensive, effective government policy measures are required.

Since 2006 the Vietnamese government has made policy adjustments to shift from encouraging export, labour-intensive industries to emphasizing more the development of intermediate and capital goods industries, making use of more advanced technologies. This reflects the move to the second stage in industrialization in Vietnam and is highly significant, promising new policies for strengthening Vietnam's manufacturing sector. Nonetheless, more detailed, effective industrial policy measures need to be created if the goal of becoming an industrialized country by the year 2020 is to be achieved as planned.

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