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AND TRADE

MONGOLIA

Competitiveness Assessment of the Industrial Sector

*Final Report**

Prepared for the Government of Mongolia
Ministry of Industry and Trade
By the United Nations Industrial Development Organization

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ABBREVIATIONS

ADB	Asian Development Bank
CIP	Competitive Industrial Performance (Index)
CIS	Commonwealth of Independent States
EGPRS	Economic Growth and Poverty Reduction Strategy
HT	High Technology (products)
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National Income
HDI	Human Development Index
ICT	Information and Communications Technology
ISIC	Industrial Standard International Classification
ITDP	Industrial and Trade Development Policy Review
KEI	Knowledge Economy Index
KI	Knowledge Index
LAC	Latin America and the Caribbean
LDC	Least Developed Countries
LT	Low Technology (products)
MS	Market Share
MT	Medium Technology (products)
MHT	Medium and High Technology (products)
MIT	Ministry of Industry and Trade
MNCs	Multi-National Corporations
MVA	Manufacturing Value Added
MENA	Middle East and North Africa
NIEs	Newly Industrializing Economies
PP	Primary Products
RB	Resource-based (products)
R&D	Research & Development
SITC	Standard International Trade Classification
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Science and Culture Organization
UNIDO	United Nations Industrial Development Organization
WB	World Bank
WTO	World Trade Organization

EXECUTIVE SUMMARY

1. This study proposes a preliminary assessment of Mongolia's industrial sector and sub-sectors, in its aim to provide the Ministry of Industry and Trade (MIT) with information and inputs to map out an industrial development strategy for the medium and long term. The study draws on the methodology developed by UNIDO in its Industrial Development Report 2002/2004, which methodology proposes to benchmark national industrial performance as a first step in formulating industrial strategy.

2. Mongolia shares, with other transition economies in Central Asia, several common features. They are more or less landlocked countries, richly endowed with mineral wealth and vast areas of arable land. They all have undergone major structural shifts in their economies over the last decade. Before 1990, they had larger industrial sectors and smaller service sectors than market economies with comparable per capita incomes. Since then, their manufacturing sectors have tended to contract, and their economy shows a heavy dependence on a few commodities and faces the daunting challenge of diversification.

Benchmarking industrial performance

3. Structural shifts in Mongolia and Central Asia's transition economies over the last decade are reflected in the widespread falls in MVA as a share of GDP and in per capita MVA between 1990 and 2002. Structural changes in manufacturing over the same period shows that Mongolia still has one of the highest weight in resource-based and low-tech manufacturing activities, but has decreased the share of these industries over the last decade.

4. Turning to the export performance of industry, Mongolia and Central Asia's transition economies are still characterized by a small manufacturing production base, rather abundant natural resources and an export base concentrated on a small number of products. Primary commodities account for the bulk of merchandise exports, and manufactured exports consist mainly of traditional, low value-added manufactures.

The part of high-tech exports in manufactured exports is still considered as marginal.

5. A ranking of 155 economies around the world by the UNIDO's CIP index provides useful insights into industrial performance in the new setting of rapid technical change, liberalization and globalization. As a general feature, most mature industrial economies have lost ranks to new entrants. Singapore was the best global performer in 1990 and 2000. Ireland came next, leaping to 2nd place in 2000 from 9th in 1990 and 19th in 1980. Interestingly, Singapore and Ireland followed similar strategies, entering high-tech global value chains and developing strong human capital and infrastructure. The next seven places in 2000 are held by mature industrial countries, led by Switzerland (the leader in 1980). The next entrants (at ranks 10 and 11) are developing countries: Taiwan and the Republic of Korea. Both used very different strategies from Singapore, seeking to build domestic capabilities, constrain inward foreign direct investment and leverage global value chains by arm's length relationships rather than rely heavily on FDI.

6. Among the newcomers to the CIP index database, the transition economies (22 new entrants) and the Sub-Saharan African economies (21 new entrants) are of particular interest. Transition economies span a large range in the CIP index, from Hungary at 22nd to Kyrgyzstan at 121st. The economies of SSA tend to cluster near the bottom of the CIP index, occupying 19 of the last 30 ranks. Also near the bottom is Mongolia, which is in the 148th position, just before Botswana, Ethiopia, Burundi, Central African Republic, Tonga, Comoros and Mali.

7. According to UNIDO, one of the many factors accounting for sustained success in developing countries appears to be the ability to develop exports by tapping into global value chains. There are two routes to doing this: building strong local capabilities (in domestic enterprises) or attracting export-oriented FDI. The Republic of Korea and Taiwan chose to build domestic capabilities first, while Malaysia chose to rely on FDI – but over time there has been growing convergence between them.

8. The UNIDO methodology also benchmarks five leading factors that greatly influence competitive industrial performance: skills, technological effort, inward FDI, technology licensing, and modern infrastructure. These structural factors (especially skills, technology and FDI) will be further examined in the report. The idea, as explained in the methodology, is not to fully account national industrial performance, but to capture key influences on industrial performance and to have comparable quantitative data across a wide range of economies.

Benchmarking industrial/ technological capabilities

9. Let's start by benchmarking *skills*. One possible measure is the overall enrollment rates, particularly in the higher level managerial and technical skills needed to handle modern technologies efficiently. One illustration of this is the enrollment rates in tertiary level technical subjects (e.g. in sciences, engineering, mathematics, computing).

10. In terms of the intensity of technical skill creation (measured by the number of enrollments per thousand population), Korea is the world's leader (21.42 students enrolled/1,000), followed far behind by Finland (17.83), Taiwan (16.85), the Russian Federation (16.41), and Singapore (11.92) in the first five places (see table 3.10). The next five places are occupied by mature industrialized countries. The four mature Asian tigers (Hong Kong, Korea, Singapore and Taiwan) and two new Asian tigers (Malaysia and Thailand) are among the first 20 places of the ranking. The last thirty places are mostly occupied by South Asian and SSA countries, with most of the least developed countries clustered at the bottom of the table. The intermediary group spans from New Zealand at 33rd place (6.68) to Costa Rica at 74th (2.05), with Mongolia at the 60th position (4.04).

11. With regard to tertiary enrollments as a percentage of relevant age group, Mongolia is fairly well positioned (with a 35% rate in 2001/02, compared to the 61% average rate for high-income countries and to 33% for upper middle-income countries). Mongolia offers an interesting case for policy debating: while its industrial and export performance lagged behind that of the new Asian Tigers, its record in terms of educational attainments stood comparison with that of Malaysia or Thailand.

12. Coming now to *technological effort*, the only available comparative data across regions and countries are formal R&D and patents (the former is an R&D input and the latter R&D output). These indicators are partial, since a large part takes the form of informal effort on the shop floor and supporting quality, engineering, procurement and distribution operations. However, these indicators do provide insights into technological activity, bearing in mind that formal R&D becomes important in developing countries simply for absorbing complex new technologies.

13. Another way to benchmark *technology* is to combine R&D with patents taken out internationally (in this case, in the US). Lall (2003) suggests an indicator of his own (the Technology Effort Index shown in table 3.12), ranking a large sample of countries according to a combination of enterprise-funded R&D and patents (though countries at the bottom could not be ranked because they did not undertake meaningful technology effort by either measure).

14. A final indicator of technological capability is the World Bank's new «Knowledge Economy Index» (available at http://info.worldbank.org/etools/kam2005), based on its «knowledge assessment methodology» (KAM). According to the Bank, the application of knowledge – as manifested in areas such as entrepreneurship and innovation, R&D, software and design, and in people's education and skill levels – is now recognized to be one of the key sources of growth in the global economy. Countries such as Korea, Malaysia, Finland, China and Costa Rica illustrate the rapid progress that can be made over relatively short periods of time by pursuing coherent strategic approaches to building their country's capabilities to create, access, and use knowledge.

15. The KAM was designed to proxy a country's preparedness to compete in the knowledge economy. It uses more than 80 structural and qualitative variables to measure countries' performance on the four pillars of the development of a knowledge society: (i) economic incentive and institutional regime; (ii) education; (iii) innovation; and (iv) ICT infrastructure. Each variable is normalized on a scale of zero to ten relative to other countries in the comparison group totaling 128 countries. The KAM data also allows to derive country's overall Knowledge Economy Index (KEI) and Knowledge Index (KI). The KI is the average of the performance of a country in three pillars: education, innovation and ICT infrastructure (it ignores the economic incentive and institutional regime). It thus serves as a useful combination of the factors reviewed earlier, with the addition of an ICT infrastructure variable.

16. Figures 3.1 and 3.2 in the report show the Knowledge Index scores for East Asia and the main landlocked economies of Asia and Latin America, for 1995 and the most recent available year, the scores ranging between one and ten. The four mature Asian Tigers are well in advance of other Asian countries. Mongolia has a relatively good position, staying ahead of China and Indonesia in the most recent years, while it was behind them in 1995. It has the second highest improvement in the KI since 1995, after Vietnam. Compared to the landlocked countries, and more particularly to Central Asia's landlocked transition economies, Mongolia is the second best performer after Kazakhstan.

17. With respect to *foreign direct investment* (FDI), Mongolia has only recently opened up to FDI, and foreign investors appear to have taken an increasing interest in the country, as highlighted by the sustained growth of FDI inflows since the end of the last decade: from $19 million in 1998, FDI inflows jumped to

$30 million in 1999, $54 million in 2000, $78 million in 2002, $132 million in 2003 and 147 million in 2004. From an insignificant base in 2000, Mongolia's share in global FDI inflows rose to a more appreciable 0.02% in 2004; its inward FDI share in the developing world also increased significantly (see table 3.13).

18. In the *World Investment Report 2004*, UNCTAD has developed two indices for benchmarking inward FDI performance and potential. The Inward FDI Performance Index is a measure of the extent to which host countries receive inward FDI. The Index ranks countries by the amount of FDI they receive relative to their economic size, calculated as the ratio of a country's share in global FDI inflows to its share in global GDP. A value greater than one indicates that the country attracts more FDI in proportion to its economic size; a value below one shows that it receives less (a negative value indicates that foreign investors disinvested in that period). Thus, a higher index implies success in the competition (explicit or implicit) to attract FDI. By this measure, Mongolia ranked among the top 20 best performers, in terms of its competitiveness in attracting inward FDI (see table 3.14). Of the top 20 performers, 3 were developed countries, 2 Asian mature NIEs, 6 transition economies, and 9 other developing countries. Many high performers in the developing and transition economies were relatively small, with lumpy FDI inflows in resource-based activities or privatization.

19. One important reason for the sustained rise in investment interest in Mongolia is its improved policies: trade and FDI liberalization, better macro policies and greater socio-political stability. Moreover, the Mongolian private sector has grown considerably since 1990, with more than 90% of Mongolian enterprises now being privately owned. This achievement is the result of nearly 15-year-long program of privatization and creation of an enabling environment generally supportive of new private investment. Although emphases and priorities of successive governments have differed, policy to open the economy to private sector entrepreneurship has been consistent. Assuming that these improvements continue, the rise in interest is likely to be sustained.

The business environment

20. The Mongolian business environment is still handicapped by major impediments to competitiveness. The USAID-sponsored *Economic Policy Reform & Competitiveness Project* has subcontracted with Human Fortis Co. Ltd, a local consulting firm, to conduct a national survey of 105 business executives during January-March 2005. The survey identified the major impediments for doing business in Mongolia. In the view of Mongolian business executives, inefficient government bureaucracy, inadequate supply of infrastructure, tax rates, corruption, and tax regulations are among the top five most problematic factors.

To conclude ...

21. As highlighted in the analysis, industrial performance is influenced by a range of factors, including the macroeconomic environment, the overall investment climate and business environment, government policies and regulations, FDI, political and social stability, supporting institutions, skills, technologies, infrastructure, and so on. This study focuses on the key structural factors which are directly relevant to building industrial/technological capabilities.

22. The study confirms findings around the world that the economies which performed best in the CIP index were also those which upgraded the most their technological capabilities: they spent the most on R&D by manufacturing enterprises and on royalties; they also possessed the best modern physical infrastructure, attracted the most inward FDI, and had the most educated workforce. It is quite understandable that, for a low-income and landlocked country, Mongolia's industrial and export performance lagged behind those high-flying countries, but one thing has emerged from the study: Mongolia's record in terms of educational attainments stood

comparison with that of Malaysia and/or Thailand. This means that the potential for a rapid build-up of industrial/technological capabilities exists inside Mongolia, and this potential is quite substantial, in comparison with other countries at the stage of development (Nepal, Lao PDR, for example).

23. Against this background, a gradual and timely diversification of the manufacturing sector towards the production of a selected number of higher technology goods and exports can help Mongolia prepare for the future, as well as accelerate innovation and learning, and generate externalities for the rest of the economy. For sustained industrial development, reliance on static endowments such as primary resources and/or low-cost labor is a good way to start, but this should be then accompanied by building and enhancing technological capabilities to produce technology-intensive manufactures. Many previous studies have shown that Mongolia has not yet exploited the full potential of their agro-industries. They need to move up the value chains.

Measuring sectoral competitiveness

24. There are many criteria for the selection of sectors with competitive potential. One straightforward technique is the analysis of market positioning. Such an analysis is based on analyzing the trends in the shares of a country's exports in the dynamic or stagnant products in world trade and the country's overall competitive position in whether it is gaining or losing market share (see box 4.1). The key questions are: how attractive are the country's exports; are they growing at a faster or slower rate than the average in the world? What is the market share of such exports and is it increasing or decreasing during the period? We propose to illustrate such analysis for Mongolia and Malaysia.

25. Figure 4.1 in the report illustrates the analysis of market positioning of the top 20 exports for Mongolia. The size of the bubble shows the value of the export category, and the position in the quadrant its relative positioning. There is a horizontal line representing the average rate of growth of world exports. There are few «champions» in Mongolia as compared to Malaysia, and the dominant one is «non-monetary gold», a special transaction (excluded from the technology-based classification of manufactures) facing volatile markets. Other champions are based on «leather» (classified as LT manufacture) and «animals, live, n.e.s.» (a special transaction). Five other export categories just at the limit between the «champions» and the «underachievers» are: «undergarments, knitted or crocheted» (LT), «petroleum products, refined» (RB), «coal» (PP), «petroleum oils, crude» (PP), and «copper» (PP). In Malaysia, by contrast, there are a large number of champions, and most of these are medium and high-tech products. The Mongolian market positioning is not very promising as far as manufactured products go.

1 INTRODUCTION

Prior to the transition from a centrally planned to a market-based economy in the early 1990s, Mongolia's industry was relatively large and organized, generating substantial modern sector employment. During the course of the decade however, the privatized state-owned companies collapsed, and the overall share of industrial activities in the economy declined significantly from 36% of GDP in 1990 to some 20% in the early 2000s; the share of the manufacturing sector dropped from 12% of GDP in 1995 to 6% in 2000 and further to 5% in 2004. At the same time, the manufacturing sector became less diverse and technologically less advanced, with the food, textile and garment sub-sectors increasingly gaining in importance at the expense of the chemical, metal, transport and electrical industries. State equity in manufacturing remains significant[1], and the manufacturing sector's former high labor productivity, the engine of growth for the rest of the economy, now matched the average for the whole economy. In the garment industry, removal of clothing quotas by the United States, Mongolia's major market, in 2005 may threaten garment production if foreign joint ventures leave the country as a result.

Mongolia offers a difficult business environment for manufacturing investment due to its land-lock geography, small population of 2.6 million (half of which is nomadic), low purchasing power, inadequate physical infrastructure, rugged land topography, as well as increasing competition from neighboring China and Russia. These problems (beyond the country's immediate control) are further compounded by several unresolved structural problems stemming from a rapid transition to a market-based economy: bungled privatization of state-owned enterprises leading many viable industries to bankruptcy, breakdown in supply chains, inability of privatized firms to identify new markets outside the former socialist block, deteriorating quality of raw materials, mounting competition in its home as well as third markets, inefficient government services and a somewhat inhospita-

1 There are still 80 state-owned enterprises to be privatized. According to the authorities, the private sector's shares in sectoral GDP in 2000 (the latest year for which data are available) were 98% for agriculture, 90% for trade, 49% for manufacturing, 17% for transportation, 5% for communications, and zero for energy *(Trade Policy Review – Mongolia*, WTO, Report by the Secretariat, WT/TPR/S/145, 15 February 2005).

ble business environment. All in all, they present serious challenges to rapid industrialization.

On the other hand, Mongolia has ready access to the rapidly expanding economies of China, Korea and Southeast Asia, as well as the large Russian market. It has also developed industrial skills and, unusually for a developing country, substantial previous experience in operating and managing a modern manufacturing sector. The manufacturing sector can thus thrive once again, provided the Government takes decisive steps to resolve long-standing transition problems, improve its business climate and government services, and identify new market niches for products which have a higher processing and value-added content than the commodities mainly exported at this present stage. Mongolia has a number of competitive assets that can form part of a development strategy to overcome the country's natural disadvantages. These include tourism, organic farming, livestock-related agro-industry, light manufacturing, business services, tertiary institutes, and technology-based industries.

This study proposes a preliminary assessment of Mongolia's industrial sector and sub-sectors, in its aim to provide the Ministry of Industry and Trade (MIT) with information and inputs to map out an industrial development strategy for the medium and long term. The study draws on the methodology developed by UNIDO in its Industrial Development Report 2002/2004, which methodology proposes to benchmark national industrial performance as a first step in formulating industrial strategy.

2 OVERVIEW OF MONGOLIA'S INDUSTRY

2.1 Restructuring for a market economy

Before 1990, Mongolia's industry[2] generated about one-third of national income and substantial modern sector employment. The industrial sector, modeled on Soviet industry, was stated-owned and traded mainly with other Comecon countries. It was a more diverse sector than now, consisting mainly of one or two large-scale, state-owned modern enterprises in each sub-sector. It was also quite dynamic, growing significantly throughout the 1980s at an average of about 9% per annum during the first half of the decade, and 5% thereafter.

Following the transition from a centrally planned to a market-based economy, the situation of state-owned enterprises deteriorated rapidly. As a result, the overall share of industrial activities in the economy declined significantly from 36% in 1990 to some 20% in the early 2000s; the share of the manufacturing sector dropped from 12% in 1995 to 6% in 2000 and 5% in 2004 (see table 2.3). In fact, except for mining (copper and gold), production declined in most areas of manufacturing (see table 2.1). Overall employment in industry has also declined (see table 2.3).

Recovery is slow owing to shortages of domestic investment, raw materials and new technology. High corporate taxes and high interest rates are also a matter of great concern. *The industrial and trade development policy (ITDP) review* in Mongolia in end 2002 (UNDP/UNIDO, 2002) reveals further unresolved transition problems: [i] bungled privatization of state-owned firms, leading many viable industries to bankruptcy; [ii] breakdown in supply chains, particularly in the procurement of raw materials from the livestock and agricultural sectors; [iii] inability of previously state-owned firms to identify new markets following the collapse of the socialist block for Mongolian products such as leather boots and jackets; and [v] resurgence of animal diseases, previously under control from a relatively extensive and effective network of veterinary services.

[2] The term «industry» used here refers to mining + manufacturing + electricity, gas and water. Prior to 1995, statistical data for the manufacturing sector were not shown apart.

Table 2.1: Industrial Production in Mongolia (1993-2004)

Product (000 metric tons, unless otherwise specified)	1993	1995	1996	1998	2001	2002	2004
Copper concentrate	334	346	351	358	381	376	371
Gold concentrate (kilograms)	1,117	4,504	6,976	9,531	13,675	12,097	19,417
Bricks (millions)	33	22	25	19	21	13	12
Cement	82	109	106	109	68	148	62
Lime	51	51	55	56	30	42	30
Sawn timber (000 m3)	85	61	70	36	21	10	18
Scoured wool	4	1	1	1	2	1	2
Felt (000 meters)	241	77	96	103	110	113	68
Woolen fabrics (000 meters)	290	71	45	5	38	32	59
Coat (000)	1	0	0	0	...	...	...
Product (000 metric tons, unless otherwise specified)	1993	1995	1996	1998	2001	2002	2004
Suit (000)	3	1	1	2	...	...	...
Leather footwear (000 pairs)	1,031	246	87	33	17	9	3
Leather coat (000)	9	13	5	0	0	0	0
Sheepskin coat (000)	87	17	15	1	2	2	4
Meat, excl. pork	17	11	9	7	12	7	4
Flour	176	159	92	66	38	50	58
Bakery products	46	37	30	19	8	6	7
Dairy products (liters)	13	2	2	3	1	3	6
Toilet soap	171	263	268	...	...	...	...
Carpets (000 m2)	1,000	596	666	588	615	534	690

Source: National Statistical Office

According to the ITDP review, it would be difficult for the manufacturing sector to fully recover without first rehabilitating the agricultural and livestock sector, particularly veterinary and animal breeding services, raw materials quality control, grading and sorting services, and raw materials procurement systems. Action will also be needed to revamp and upgrade the management of state-owned firms, as well as more careful privatization of the remaining manufacturing firms scheduled to be privatized.

2.2 Structure of the manufacturing sector

Since 1990, the manufacturing sector has undergone considerable restructuring. Many industries (such as machinery, chemicals, metal, transport, and electrical products), which were dependent on past state intervention, have contracted. The main manufacturing industries are labor-intensive livestock-based activities, such as food, beverages, leather, textile, garment, and footwear. These sub-sectors account for the bulk of MVA and manufacturing employment, and constitute virtually all the available range of the country's manufactured exports.

Table 2.2: Structure of the Mongolian Manufacturing Sector, 2001 vs. 1992

		Share in manufacturing value added (%)		Share in manufacturing employment (%)		Share in manufactured exports (%	
ISIC	Sub-sectors	1992	2001	1992	2001	1992	2001
15	Food & beverages	38.5	45.7	18.0	23.5	3.3	0.2
17/18	Textile, garment	34.4	34.6	33.9	54.5	53.6	71.5
19	Leather, footwear	8.3	0.3	14.7	1.4	22.3	21.7
20	Wood & wood products	2.5	0.8	12.3	3.2	8.5	...
21	Paper and paper products	0.0	0.0	0.0	0.1	0.3	...
22	Publishing, printing	1.0	1.0	1.8	2.7	...	...
24	Chemicals	1.0	0.8	1.7	2.2	1.8	1.6
25	Rubber and plastic products	0.0	0.6	0.0	0.0	0.3	0.2
26	Non-metallic mineral products	2.7	3.2	8.5	6.4	1.0	...
27	Basic metals	0.0	1.0	0.2	2.3	7.7	2.4
28	Fabricated metal products	0.1	0.1	0.7	0.8	0.2	0.8
29	Machinery	0.1	0.0	0.1	0.9	...	...
31	Electrical machinery	0.2	0.0	0.4	0.3	...	...
32	Electronic products	0.4	0.0	0.1	0.1	...	...
33	Precision equipment	0.1	0.1	0.3	0.3	...	...
34	Vehicles, trailers	0.7	0.0	0.9	0.1	...	...
35	Other transport equipment	0.1	0.1	0.2	0.0	0.5	0.8
36	Furniture, other mfg	9.8	11.6	6.1	1.2	0.5	0.8
	Total manufacturing	100.0	100.0	100.0	100.0	100.0	100.0

Source: UNIDO database/NSO

Food and beverages is manifestly Mongolia's leading manufacturing sub-sector. In 2001, this sub-sector represented nearly 46% of total MVA and about 24% of manufacturing employment. It has strong backward linkages to the economy and a low level of import dependence. Meat is currently the only export product and is the only one with further potential for development as an export. All other food products including beverages are limited to supplying the domestic market.

Textile and garment together comes next as Mongolia's second largest manufacturing sub-sector, accounting for 35% of total MVA and 55% of manufacturing employment in 2001. Much of the growth registered in this sub-sector has been export-led, and textiles' share (dominated by cashmere) in manufactured exports grew rapidly from 54% to 75% between 1992 and 2001. However, removal of clothing quotas by the United States, Mongolia's major market, in 2005 may threaten garment production if foreign joint ventures leave the country as a result.

Mongolia's third and last main manufacturing sub-sector *is leather* processing and products. This sub-sector has undergone major structural changes, as most Mongolian hides and skins are exported to China either raw or as semi-processed wet blue, and domestic demand for leather jackets, boots and other products has now to rely on imported hides/skins from Korea and Turkey. Nowhere is the rapid de-industrialization of Mongolia more apparent than in the leather goods industry. Between 1990 and 1995, the production of sheepskin, goatskin, large hides, leather boots, leather coats, skin coats and

leather jackets declined by more than 90%, and was negligible by 2000. There was a timid revival since 2001 in sheepskin, goatskin and leather boots, but not in other products. As a result, the sub-sector' share in total MVA and manufacturing employment dropped respectively from 8% and 15% in 1992 to 0% and 1% in 2001; but its share in the country's manufactured exports still hold firm (around 22% in 2001).

The manufacturing sector has been analyzed in considerable detail in the ITDP review. The review has singled out the wide range of livestock-related industries as a key characteristic of the Mongolian manufacturing sector. These includes meat processing, dairy, leather tannery, leather footwear and products, fur garments, cashmere processing and garment manufacturing, camel hair processing, wool carpets and blankets, felt shoes and other felt products, etc.. Although the production levels of most of these are to date only a fraction of their pre-transition levels (with the exception of the cashmere industry), the potential for expanding livestock-based industries remains very high. Mongolia possesses ample excess capacity in most sub-sectors, which can be quickly revived with minimal investment in new equipment in most cases. It has ready access to the rapidly expanding economies of China, Korea and Southeast Asia, as well as the large Russian market. It has also relatively developed industrial skills and substantial previous experience in operating and managing a modern manufacturing sector. Labor costs, according to the ITDP review, are lower than in China, Indonesia and India, giving Mongolia a significant cost advantage. All these factors can turn again the manufacturing sector as the engine of economic growth and provide productive employment.

2.3 Recent developments

Mongolia's manufacturing sector is on a difficult recovery path. While aggregate real growth has rebounded to pre-transition levels by 2001, the share of the manufacturing sector in GDP has not shown any improvement since then. With the compositional changes in the GDP over the last decade, the services sector has displaced agriculture to become by far the largest, accounting for 53% of GDP in 2004 (38% in 1995); agriculture declined from 38% to 20%, and manufacturing fell from 12% to 5%. The services sector is also the major employer (nearly half of total employment in 2004), followed by agriculture (around 40%) and industry (12%). Manufacturing's share in total employment is estimated to be around 3-4% (see table 2.3).

Improved macro-stabilization and ongoing structural reforms have contributed to the economy's recovery. These reforms featured strongly in the *Government's Action Program for 2000-2004*, and were reinforced in its *Economic Growth and Poverty Reduction Strategy (EGPRS)*, adopted in July 2003. The Government's EGPRS objective is to achieve annual real economic growth of 5.5-6.0%. This was achieved ahead of schedule in 2003 (5.6%) and 2004 (10.6%). GDP growth in the last two years largely reflects a turnaround in agriculture and a buoyant services sector. The surge in GDP growth for 2004 can be put on account of a stronger performance in agriculture, expanding mining output, and buoyant world gold and copper prices; the contribution of manufacturing was minimal.

Mongolia's manufacturing sector has undergone considerable restructuring, but the broad picture on manufacturing sector performance in Mongolia does not appear to be very encouraging. The sector has emerged from a decade-long transition, with a large unfinished agenda that remains to be completed. On the other hand, Mongolia is affected by the phasing out of the Multi-Fiber Arrangement and could lose garment-making jobs if it cannot upgrade to higher value-added products and compete in international markets, though prospects may be brighten following a new bilateral trade agreement with the USA.

Other constraints include the dependence of some of the country's major growth industries on energy consumption, which poses a risk to sustainable development. The resulting air pollution and land and water degradation could hamper future growth. Furthermore, the country's competitiveness suffers from high transport costs, insufficient infrastructure, and limited access to credit (ADB, 2005).

Table 2.3: Structure of GDP and Employment, 1980-2004

Share of GDP by sector (in %)								
	1980	**1990**	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**
GDP	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agriculture	14.0	15.2	38.0	29.1	24.9	20.7	20.1	21.3
Industry	29.0	35.6	25.8	20.0	20.0	20.2	22.3	25.6
Mining			12.0	11.5	9.0	10.1	12.7	17.3
Manufacturing			12.1	6.1	8.1	6.3	6.2	5.3
Electricity, gas and water			1.7	2.4	2.9	3.8	3.4	3.0
Services	57.0	49.2	36.2	50.9	55.1	59.1	57.6	53.1
Construction			1.7	1.9	2.0	2.3	3.1	2.6
Trade			17.0	24.0	26.7	27.7	26.5	24.6
Transport & communications			6.4	11.0	13.0	14.7	13.9	12.7
Financial intermediation			1.2	2.5	3.1	3.2	3.8	4.6
Other services			9.9	11.4	10.3	11.1	10.4	8.6
Share of employment by sector (in %)								
Total employment			100.0	100.0	100.0	100.0	100.0	100.0
Agriculture			46.1	48.6	48.3	44.9	41.8	40.2
Industry			14.1	11.2	11.2	11.4	11.7	12.0
Mining			...	...	...	...	...	...
Manufacturing			5.9	4.7	5.1	*4.0	*4.0	*3.7
Electricity, gas and water			...	...	...	...	...	...
Services			39.8	40.2	40.5	43.7	46.5	47.8
Labor force (000 persons)								
Labor force			812.7	847.6	872.6	901.7	959.8	986.1
Employment			767.6	809.0	832.3	870.8	926.5	950.5
Unemployed			45.1	38.6	40.3	30.9	33.3	35.6

Source: GDP data from ADB; employment data from NSO and Ministry of Finance and Economy
* Estimates

The private sector's share in the economy has increased to 85%, but substantial challenges remain. A large body of legislation to improve the environment for private sector development has been enacted, but a lag remains between enactment and application. Interest rates remain high and terms for lending are short, which restricts investment to big borrowers and limits broad access to credit, hindering the development of SMEs. Although investment remains strong, mobilization of savings is not progressing, and the savings ratio is declining. The gap between savings and investment needs to be covered by foreign funds (ADB, 2005).

The current macroeconomic stability and the needs to consolidate recent economic achievements through a fully integration with the world markets provide a sound basis for considering a joint public-private partnership in developing a vision and consensus building of where the manufacturing sector is going to be in the next twenty years or so. Even if the manufacturing sector seems now to be less diverse and technologically less advanced than before the transition process, it is worthwhile noting that there exists a common understanding that the Government and the private sector should work hand in hand to move the economy forward.

3 COMPARATIVE REVIEW OF MONGOLIA'S INDUSTRIAL PERFORMANCE

This chapter sets out to review Mongolia's industrial performance throughout a set of output and input indicators. Output indicators are those which reflect the country's competitive situation and include such parameters as manufacturing value added (MVA), manufactured exports, the technological structure of the country's production and exports, export concentration and diversification. Input indicators, on the other hand, attempt to measure the determinants of industrial competitiveness and include such components as skills, technological effort, investment, infrastructure, and business environment. The review consists in comparing -- or *benchmarking* -- the industrial performance of Mongolia with that of other transition/developing economies presenting similar development conditions (Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Nepal), of direct and fast growing competitors (China, Malaysia, and Thailand), and finally, of East Asia's newly industrializing economies (Republic of Korea and Singapore) acting as role models.

3.1 Mongolia and the benchmark countries

Mongolia shares, with other transition economies in Central Asia, several common features. They are more or less landlocked countries, richly endowed with mineral wealth and vast areas of arable land. They all have undergone major structural shifts in their economies over the last decade. Before 1990, they had larger industrial sectors and smaller service sectors than market economies with comparable *per capita* incomes. Since then, their manufacturing sectors have tended to contract, and the economy shows a heavy dependence on a few commodities and faces the daunting challenge of diversification.

Table 3.1: Overview of the Benchmark Countries

	GNI per capita ($)	GDP ($ billions)	GDP average growth (% p.a.)			HDI Ranking (over 177 countries)
	2004	2004	1980-90	1990-00	2000-04	2005
Azerbaijan	950	3.3	...	-0.3	10.7	69th
Kazakhstan	2,260	40.7	...	-4.1	10.3	80th
Kyrgyzstan	400	2.2	...	-4.1	4.5	109th
Tajikistan	280	2.1	...	-10.4	9.9	122th
Turkmenistan	1,340	6.1	...	-4.8	18.5	97th
Mongolia	590	1.5	5.4	1.0	5.2	114th
Nepal	260	6.7	4.6	4.9	2.6	136th
China	1,290	1,649.3	10.3	10.0	8.7	85th
Malaysia	4,650	117.8	5.3	7.0	4.3	61th
Thailand	2,540	163.5	7.6	4.2	5.3	73th
Korea, Republic	13,980	679.7	9.0	5.8	4.7	28th
Singapore	24,220	106.8	6.7	7.9	2.8	25th

Source: World Development Indicators 2005 (WB), Human Development Report 2005 (UNDP)

Kyrgyzstan and Tajikistan are, like Mongolia, low-income countries, with a small productive base, leaving them vulnerable to natural disasters and external shocks. Azerbaijan, Turkmenistan and Kazakhstan are oil rich, lower middle-income countries: Azerbaijan has witnessed an impressive double-digit GDP growth over the past five years, mainly led by developments in oil and gas; however, diversified development of the non-oil sector is essential for generating jobs and promoting long-term growth. Turkmenistan is potentially wealthy with recoverable natural gas reserves ranking among the top ten in the world, as well as substantial proven oil reserves and an extensive irrigation system; it is both energy self-sufficient and a major exporter of natural gas, oil and oil products, and electricity. Kazakhstan is by far the largest economy in Central Asia and one of the most sparsely populated countries in the world; oil extraction and oil-related construction, transportation and processing accounted for more than 16% of GDP in 2004, and fuel and oil products made up 63% of exports; ferrous and non-ferrous metals and grains are the only other significant exports products; while exports of non-extractive commodities increased considerably in 2004, the share of manufactures in total exports fell to half the 1999 level. With regard to achievements in terms of life expectancy, educational attainment and adjusted real income, Mongolia and the transition economies in Central Asia are classified among the «*medium human development*» group of countries (positions 58th through 145th) by UNDP in its *Human Development Report 2005*[3].

Nepal is included in the sample to illustrate the case of a least developed and landlocked economy, whose stage and conditions of development are much comparable to Mongolia's economy: like Mongolia, Nepal is facing increasingly stiff competition in its traditional export markets and products, while its manufac-

[3] The 2005 Human Development Report reveals however, that 18 of the world's poorest countries, with a total population of 460 million, are doing worse on most key human development indicators than they were in 1990. Twelve of the 18 countries are in sub-Saharan Africa. The other six countries that suffered reversals since 1990 belong to the Commonwealth of Independent States (CIS) that are successors to the Soviet Union. Since 1990, Tajikistan has fallen 21 places in the HDI rankings, Ukraine 17, and the Russian Federation 15. Declining life expectancy, combined with economic disruption after the fall of the Soviet Union, are the main factors, the Report states.

turing sector suffers from many long-standing weaknesses, including poor investment climate and business environment, inadequate physical infrastructure, and an underdeveloped «*infra-technology*». However, while being one of the poorest countries in the world, Nepal is favorably classified among the «*medium human development*» group, as the country has made encouraging progress, with regard to the number of households with access to electricity, health care, and universal education.

Compared to Mongolia, the competing and fast growing economies of China, Malaysia and Thailand are at a more advanced stage of development. They are middle-income countries, with fairly high rankings with regard to human development (China for itself have increased its HDI ranking by about 20% since 1990). China is of obvious interest: it is the leading industrial power in the developing world and poses a strong competitive challenge to other economies in the region and elsewhere – across the entire technological spectrum. Malaysia and Thailand are not major industrial powers, but their industrial development experience is interesting: in the new setting of rapid technical change, liberalization and globalization, their sustained success stems from their ability to develop exports by tapping into global value chains.

Lastly, the Republic of Korea and Singapore are also included in the sample, notably for their role model. Singapore is widely recognized as an exceptional global performer, entering high-technology global value chains and developing strong human capital and infrastructure. On the other hand, the Republic of Korea used a very different strategy, seeking to build domestic capabilities, constrain inward foreign direct investment and leverage global value chains by arm's length relationships rather than rely heavily on FDI. The Republic of Korea and Singapore are now in the league of industrialized countries, with a very high industrial capability base as well as «learning» potential.

3.2 Manufacturing performance

MVA Analysis

Structural shifts in Mongolia and Central Asia's transition economies over the last decade are reflected in the widespread falls in MVA as a share of GDP and in *per capita* MVA between 1990 and 2002. As a least developed landlocked country, Nepal has unexpectedly made substantial progress, both in terms of MVA share in GDP and *per capita MVA*. In East and Southeast Asia, China, Malaysia and Thailand are continuing to show both fast growing shares of MVA in GDP and rapid increases in per capita MVA, while the Republic of Korea and Singapore are experiencing early signs of mature economies, with MVA share in GDP starting to level out.

It is interesting to note that in the East/Southeast Asia group, the performance picture is different if the degree of industrialization is measured by MVA as a proportion of GDP, or by *per capita* MVA. By the former measure, China is the most industrialized, not only in its group, but in the world as a whole. By the latter measure, Singapore and Korea emerges as the most industrialized, respectively 18 and 14 time higher than China.

Table 3.2: Manufacturing Performance Indicators

	MVA share in GDP (%)			MVA per capita ($)			Wage per worker ($)	MVA per worker ($)
	1980	1990	2002	1980	1990	2002	2000-02	2000-02
Azerbaijan	18.6	17.0	6.8	226	230	18	...	...
Kazakhstan	26.3	20.3	20.3	383	481	214	...	...
Kyrgyzstan	25.0	23.2	8.7	119	156	35	...	...
Tajikistan	16.0	14.8	13.3	130	130	64	...	...
Turkmenistan	13.0	9.9	10.4	190	396	244	...	...
Mongolia	26.6	29.0	5.4	174	77	66	579	1,778
Nepal	5.0	5.8	8.6	8	11	23	455	2,398
China	33.0	33.1	35.4	55	101	359	...	...
Malaysia	19.4	26.5	35.0	338	757	1,516	4,545	18,014
Thailand	22.6	27.2	33.6	197	521	1,000	2,759	8,276
Korea, Republic	22.8	28.8	33.9	658	2,238	4,859	14,780	71,242
Singapore	29.7	28.6	28.2	2,277	4,410	6,582	20,570	58,009

Source: INDSTAT 2005, UNIDO

The average MVA per worker in manufacturing shows the joint impact of several factors: the composition of industry, the technology in use, the efficiency in production, the prevalence of excess capacity, pressures to carry excess labor, etc.. It can nevertheless be used as a crude indicator of the complexity, capital intensity and productivity of industry. The most advanced and capital-intensive industrial economies by this measure are naturally the Republic of Korea and Singapore. This is to be expected as these countries have succeeded in developing a competitive edge, especially in «high-tech» ventures. Malaysia and Thailand (there is no data available for China) have distinctly lighter, more labor-intensive activities. Mongolia and Nepal bring up the rear, with apparently a lot of light activities, or perhaps substantial excess capacity and a very dualistic industrial structure.

The average *wage per worker* measures the degree of skill sophistication of the industrial workforce. It completes the former *(MVA/ worker)* ratio by giving further indication on the technological structure of industrial production. Once again, by this measure, Singapore and the Republic of Korea are singled out as the most advanced industrial economies, with an industrial structure dominated by high-tech activities involving high-wage levels. On the other side, it seems clear that industrial activities in Mongolia and Nepal are predominantly low-skill/low-wage labor-intensive activities. The intermediary figures of Malaysia and Thailand suggest that these countries, while having lighter, more labor-intensive activities, are nevertheless moving, seemingly towards more capital-intensive industries.

Structural changes in manufacturing

Table 3.3 shows the distribution of MVA across selected groups of manufacturing activities over time, to illustrate both the current stage of development as well as success in transforming the structure over time away from simple, low-tech and low value-added activities. Most developing countries start industrialization, with the simplest resource-based industries: food, beverages, tobacco, textiles and clothing, etc… (these resource-based and low-tech activities are illustrated in the first four columns for the early 1990s and 2000s). As expected, Mongolia and Nepal have the highest weight, but have decreased the share of these industries over the last decade.

Table 3.3: Technological structure of MVA (early 1990s versus early 2000s)

	(RB), %		(LT), %		(MHT), %		(Starting, ending date)
	Early 1990s	Early 2000s	Early 1990s	Early 2000s	Early 1990s	Early 2000s	
Azerbaijan	...	...	...	...	28.3	35.7	(1990; 2000)
Kazakhstan	...	...	...	...	43.5	27.4	(1990; 2000)
Kyrgyzstan	...	...	...	...	4.7	5.8	(1990; 2000)
Tajikistan	...	...	...	...	4.7	5.8	(1990; 2000)
Turkmenistan	...	...	...	...	28.3	35.7	(1990; 2000)
Mongolia	61.2	54.1	37.2	39.8	1.6	6.1	(1990; 2000)
Nepal	53.0	55.8	37.0	28.1	10.0	16.1	(1990; 2002)
China	...	...	...	...	51.6	57.3	(1990; 2000)
Malaysia	32.4	21.4	16.0	15.3	51.6	63.3	(1990; 2001)
Thailand	38.2	24.3	42.6	23.1	19.2	52.6	(1990; 2000)
Korea, Rep.	21.0	15.3	23.8	17.3	55.2	67.4	(1990; 2001)
Singapore	8.0	4.5	14.1	10.4	77.9	85.1	(1990; 2002)

Source: INDSTAT 2005, UNIDO

The same picture can be applied to the transition economies in Central Asia, to the exception of Kazakhstan which has not succeeded in bringing down its share of resource-based and low-tech activities over the last decade. Singapore and Korea on the other hand, have diversified the most away from these industries. The other countries in the East/Southeast Asian group have made more or less significant inroads into diversification, with Thailand showing an exceptional performance in deepening its industrial and competitive capabilities (increasing nearly threefold its MHT activities) over the last decade.

The data shown in table 3.3 suggest the type and extent of structural transformation which has occurred over time. They suggest that China, Malaysia and Thailand have achieved fairly deep transformation rapidly, while Singapore and (to a lesser extent) the Republic of Korea achieved it earlier and stayed more or less constant since. Azerbaijan, Turkmenistan, and Nepal are progressing, but are still at an early stage, while Tajikistan, Kyrgyzstan and Mongolia are even further behind. As for Kazakhstan, which was the most advanced transition economy in the early 1990s, it is showing signs of regression and stagnation.

3.3 Export performance

Turning to the export performance of industry, let's look how well each country has succeeded in transforming the structure of its exports over time away from primary products' exportation.

Performance in manufactured exports

As shown in table 3.4, Mongolia and Central Asia's transition economies are still characterized by a small manufacturing production base, rather abundant natural resources and an export base concentrated on a small number of products. Primary commodities account for the bulk of merchandise exports, and manufactured exports consist mainly of traditional, low value-added manufactures. The part of high-tech exports in manufactured exports is still considered as marginal.

Table 3.4 shows, on the other hand, that the East/Southeast Asia's economies have succeeded (to various degrees) in diversifying their export structure and increasing considerably the share of manufactured exports in total exports.

Table 3.4: Export Performance Indicators

	Manufactured exports per capita ($)			Manufactured exports (% of total exports)			Exports of goods and services (% of GDP)		High-tech exports (% of manufactured exports)	
	1980	1990	2002	1980	1990	2002	1980	2003	1990	2003
Azerbaijan	...	...	76	...	...	35	...	43	...	5
Kazakhstan	...	...	112	...	...	20	...	50	...	9
Kyrgyzstan	...	...	22	...	...	24	...	38	...	2
Tajikistan	...	...	15	...	...	13	...	60	...	...
Turkmenistan	...	...	147	...	...	11	...	41	...	...
Mongolia	...	...	56	...	...	26	19	68	...	0
Nepal	1	9	22	23	85	72	12	17	...	...
China	...	42	235	32	76	92	6	34	...	27
Malaysia	413	1,286	4,120	48	78	93	58	114	38	58
Thailand	101	339	870	68	81	87	24	66	21	30
Korea, Rep.	519	1,455	3,591	93	96	98	34	38	18	32
Singapore	6,971	16,266	33,106	80	93	97	207	174	40	59

Source: UNIDO data base + WB data

The evolution of the share of exports (of goods and services) in GDP is a measure of the country's dynamism on export markets. While data are not available for Central Asia's transition economies beyond 1990, all other countries in the sample have shown tremendous increases in their export share in GDP over the last two decades, to the exception of Singapore whose exports-to-GDP ratio stayed already at a very high level, both in 1990 and 2003.

High-tech product exports are indeed a powerful indicator of industrial performance and competitiveness. High-tech products are those which involve advanced and fast-changing technologies, with high R&D investments, such as pharmaceuticals, aerospace, optical/measuring instruments, and data processing/telecommunications equipment. Given the limited industrial/technological capability of Mongolia, Nepal, and Central Asia's transition economies, it is not surprising that these manufactures are present on the export list of such countries. They account, on the contrary, more than half of manufactured exports of Singapore and Malaysia, and around one third of manufactured exports of Korea, Thailand and China.

Technological sttucture of manufactured exports

A straightforward way to analyze recent export patterns is to proceed to the categorization of export items according to their technological content. The OECD suggests the following classification, which takes into account product groups or clusters of particular export interest to the developing world (see table 3.5).

Resource-based (RB) products tend to be simple and labor-intensive (e.g. simple food or leather processing), but there are segments using capital, scale and skill-intensive technologies (e.g. petroleum refining or modern processed foods). Since competitive advantages in these products arises generally – but not always – from the local availability of natural resources, they do not raise important issues for competitiveness.

Low-technology (LT) products tend to have stable, well-diffused technologies. The technologies are primarily embodied in the capital equipment; the low end of the range has relatively simple skill requirements. Many traded products are undifferentiated and compete on price: thus, labor costs tend to be a major element of cost in competitiveness. Scale economies and bar-

Table 3.5: Technological Classification of Exports

Classification	Examples
PRIMARY PRODUCTS	Fresh fruit, meat, rice, cocoa, tea, coffee, wood, coal, crude petroleum, gas
MANUFACTURED PRODUCTS	
RESOURCE-BASED MANUFACTURES (RB) Agro/forest-based products Other resource-based products	Prepared meats/fruits, beverages, wood products, vegetable oils Ores concentrates, petr./rubber products, cement, cut gems, glass
LOW-TECHNOLOGY MANUFACTURES (LT)	
Textile/fashion cluster Other low technology	Textile fabrics, clothing, footwear, leather manuf., travel goods Pottery, simple metal parts, furniture, jewelry, toys, plastic prodts
MEDIUM-TECHNOLOGY MANUFACTURES (MT)	
Automotive products MT process industries MT engineering industries	Passenger vehicles/parts, commercial vehicles, motorcycles/parts Synthetic fibers, chemicals and paints, fertilizers, plastics, iron Engines, motors, industrial machinery, pumps, ships, watches
HIGH-TECHNOLOGY MANUFACTURES (HT)	
Electronics/electrical products Other high technology	Office/data processing/telecoms equpt, TVs, transistors, turbines Pharmaceuticals, aerospace, optical/measuring instruments
OTHER TRANSACTIONS	Electricity, cinema film, printed matter, special transactions gold, art, coins, pets

Source: Excerpt from "The Technological Structure and Performance of Developing Country Manufactured Exports, 1985-1998", Sanjaya Lall, QEH Working Paper Number 44, June 2000.

riers to entry are generally low. The final market grows slowly, with income elasticity below unity. However, there are particular low-technology products in high quality segments where brand names, skills, design and technological sophistication are very important, even if technology intensity does not reach the levels of other categories. In particular, the textile and garment sector has undergone massive relocation from rich to poor countries, with assembly operations shifting to low-wage sites and complex design and manufacturing functions retained in advanced countries[4]. This relocation has been the engine of export growth in this industry, though the precise location of export sites in textiles and clothing has been influenced strongly by trade

[4] This might not be true today as the conventional wisdom of developed countries as capital and technology exporters and developing countries as importers is gradually giving way to a more complex set of relationships. As global competition intensifies, transnational corporations are internationalizing even the most knowledge-intensive corporate functions, such as R&D. Until recently, this trend was limited almost exclusively to developed countries. Today, TNCs in industries such as automobiles, electronics, biotechnology and pharmaceuticals are establishing R&D facilities in selected developing countries. They do this to enhance their efficiency, to access expanding pools of scientists and engineers, and to meet the demands of increasingly sophisticated markets in these countries.
These recent trends have important implications for the international division of labor. The traditional view, of more complex production activities being undertaken in the North and simpler ones in the South, is less and less a true reflection of the reality. Firms now view parts of the developing world as key sources not only of cheap labor, but also of growth, skills and even new technologies. As TNCs are the dominant players in the creation of new technologies, it matters where they undertake their R&D. Currently, only a few developing countries attract such activities on a significant scale. Most low-income countries are not participating in global R&D networks, and consequently, do not reap the benefits that such networks can generate. (For more details, see the UNCTAD's World Investment Report 2005).

quotas (under the Multi-fiber Agreement as well as offshore assembly provisions and regional trade agreements like NAFTA). Other exports that have benefited from active relocation in this group are toys, sports and travel goods and footwear.

Medium-technology (MT) products, comprising the bulk of skill and scale-intensive technologies in capital goods and intermediate products, are the heartland of industrial activity in mature economies. They tend to have complex technologies, with moderately high levels of R&D, advanced skill needs and lengthy learning periods. Those in the engineering and automotive sub-groups are very linkage-intensive, and need considerable interaction between firms to reach «best practice» technical efficiency. Barriers to entry tend to be high. The relocation of labor-intensive processes to low-wage areas occurs but is not widespread: products are heavy and need advanced capabilities to reach world standards.

High-technology (HT) products have advanced and fast-changing technologies, with high R&D investments and prime emphasis on product design. The most advanced technologies require sophisticated technology infrastructures, high levels of specialized technical skills and close interactions between firms, and between firms and universities or research institutions. However, some products like electronics have labor-intensive final assembly, and their high value-to-weight ratios make it economical to place this stage in the low-wage areas. These products lead in new international integrated production systems where different processes are separated and located by MNCs according to fine differences in production costs. Apart from electronics, other high-technology products (aircraft, precision instruments and pharmaceuticals) remain rooted in economies with high levels of skills, technology and supplier networks. Their comparative advantage continues to be ruled by the usual technological factors.

At some risk of simplification, we propose, for the purpose of our analysis, to group RB and LT products together as having «*easy technologies*», with the main drivers of competitiveness being natural resource endowments in the former case and low wages in the latter. By the same token, we propose to group MT and HT products together as having «*difficult technologies*», with demanding, complex skill and technological development activities.

Table 3.6 shows the general trends of the technological structure of exports of the selected countries and the world as a whole, between the mid-1990s and the mid-2000s. As in the case of MVA, we observe a general trend towards a technological upgrading in manufactured exports in the developing world. Thus, MHT products currently account for nearly three fourths of total exports of Korea and Singapore, and more than half of total exports of China, Malaysia and Thailand. Nepal has also made progress in increasing the export competitiveness of its MHT products between the mid-1990s and mid-2000s. Only Mongolia and Central Asia's transition economies seem to have the production and export structure much less technology-intensive and dominated by primary products. Obviously, their effort to enhance the technology content in manufacturing production and manufactured exports will take more time.

Table 3.6: Technological Distribution of Exports (%)

Countries	Starting date (mid-1990s)			Ending date (mid-2000s)			(Starting, ending date)
	PR	RB+LT	MT+HT	PR	RB+LT	MT+HT	
Azerbaijan	10.1	76.4	13.5	68.3	24.7	7.0	(1996; 2004)
Kazakhstan	54.8	23.7	21.6	77.2	13.9	8.9	(1995; 2004)
Kyrgyzstan	27.9	51.8	20.3	55.2	34.7	10.1	(1995; 2004)
Tajikistan	NA	NA	NA	73.2	17.6	9.2	(NA; 2000)
Turkmenistan	54.3	45.3	0.4	70.7	28.5	0.8	(1997; 2000)
Mongolia	32.8	64.0	3.2	40.8	57.4	1.9	(1996; 2003)
Nepal	7.5	91.1	1.4	12.6	79.0	8.4	(1996; 2003)
China	10.0	58.0	32.0	4.7	41.0	54.3	(1995; 2004)
Malaysia	10.9	28.0	61.1	12.9	23.3	63.8	(1995; 2004)
Thailand	17.0	42.0	41.0	13.3	33.4	53.3	(1995; 2003)
Korea, Rep.	4.5	28.7	66.8	3.3	22.1	74.6	(1995; 2004)
Singapore	4.4	20.8	74.8	2.5	24.7	72.8	(1995; 2004)
World	**15.6**	**33.7**	**50.7**	**12.0**	**31.2**	**55.8**	**(1990;2003)**

Source: UN Comtrade

Export concentration and diversification

Table 3.7 shows the share of the first 5 and 10 export items in total exports for each of the selected countries. With its first 10 export items taking only 36% of its total exports, China appears to have the most diversified export structure in the sample. Malaysia, Thailand, Singapore and Korea have also a fairly high degree of diversification in their export structure. They all are among the top ten leading exporters of manufactured products in the developing world, with competitive export capabilities over a wide range of activities.

By contrast, Mongolia, Nepal, and the transition economies in Central Asia continue to show an export structure highly concentrated on a few export items. Crude oil and gas take the bulk of exports (respectively 71, 50 and 60%) of Azerbaijan, Kazakhstan and Turkmenistan, while base metal ores, aluminum, and gold are respectively the dominant export items (more than one third of total exports) of Mongolia, Tajikistan, and Kyrgyzstan. In the case of Nepal, there are no dominant export items, but the country's exports are limited to a few product categories (mainly of carpets, textiles and garments) sold in a limited number of countries.

3.4 Mongolia in the UNIDO scoreboard of industrial development

In its first *Industrial Development Report 2002/2003,* UNIDO introduced a scoreboard of industrial performance and suggested how it could be used for the formulation of industrial policy. At the core of the methodology was a *competitive industrial performance (CIP) index,* benchmarking 87 economies for the years 1985 and 1998. This index was further extended and updated in the second *Industrial Development Report 2004* to incorporate a large number of new entries in 2000, with improved data availability in the developing and transition worlds and the emergence of many transition economies as independent states in the 1990s. Thus, compared to the core group (93 economies with data covering 1980, 1990 and 2000), there are now 22 more economies from the transition group, 21 from Africa, 6 from LAC, 5 from MENA, 2 each from South and East Asia, and 3 from the Pacific to be included in the new CIP index ranking.

Table 3.7: Share of The First 5 and 10 Export Items in Total Exports of Individual Countries

2001-2002				
		As percentage		
SITC group	Value ($ millions)	of country total	of dev'lping countries	of world
Azerbaijan	2,241	100.00	1.31	0.04
First 5	2,059	91.87		
First 10	2,127	94.93		
Kazakhstan	9,164	100.00	5.35	0.15
First 5	6,462	70.51		
First 10	7,492	81.76		
Kyrgyzstan	470	100.00	0.27	0.01
First 5	291	61.97		
First 10	355	75.50		
Tajikistan	705	100.00	0.41	0.01
First 5	619	87.71		
First 10	671	95.17		
Turkmenistan	1,846	100.00	1.08	0.03
First 5	1,689	91.48		
First 10	1,776	96.20		
Mongolia	464	100.00	0.02	0.01
First 5	312	67.09		
First 10	416	89.65		
Nepal	723	100.00	0.04	0.01
First 5	483	66.78		
First 10	613	84.72		
China	295,847	100.00	15.25	4.81
First 5	67,108	22.68		
First 10	106,624	36.04		
Malaysia	91,031	100.00	4.69	1.48
First 5	43,608	47.90		
First 10	56,452	62.01		
Thailand	66,941	100.00	3.45	1.09
First 5	17,352	25.93		
First 10	25,426	37.98		
Korea, Rep.	156,450	100.00	8.06	2.55
First 5	60,224	38.50		
First 10	84,511	54.02		
Singapore	123,465	100.00	6.36	2.01
First 5	68,596	55.56		
First 10	82,896	67.14		

Source: International Trade Statistics Yearbook 2004

Table 3.8: CIP Rankings of 155 Economies in 2000

Country	CIP index ranks	CIP index values
	2000	
Singapore	1	0.833
Ireland	2	0.738
Switzerland	3	0.717
Finland	4	0.649
Sweden	5	0.633
Japan	6	0.615
Germany	7	0.593
Luxemburg	8	0.574
Belgium	9	0.567
Taiwan	10	0.549
Korea, Rep.	11	0.537
Malaysia	17	0.492
Hungary	22	0.459
Czech Rep.	26	0.406
Thailand	27	0.386
China	30	0.379
Indonesia	49	0.292
Kazakhstan	79	0.202
Turkmenistan	90	0.187
Tajikistan	99	0.167
Nepal	101	0.161
Azerbaijan	115	0.139
Kyrgyzstan	121	0.132
Guinea	147	0.071
Mongolia	148	0.070
Botswana	149	0.058
Ethiopia	150	0.050
Burundi	151	0.047
RCA	152	0.041
Tonga	153	0.041
Comoros	154	0.041
Mali	155	0.040

Source: UNIDO Industrial Development Report 2004

The new performance index

The original index was constructed from four indicators, which were reviewed previously: [i] manufacturing value added (MVA) per capita; [ii] manufactured exports per capita; [iii] the share of medium and high-tech products in MVA; and [iv] the share of medium and high-tech products in manufactured exports. The first two indicators relate to industrial capacity, while the last two reflect technological complexity and industrial upgrading. The index was further refined in the second Report, by sub-dividing the previous last two index components, which respectively reflect the industrialization intensity (measured by the simple average of the share of MVA in GDP and the share of MHT in MVA) and the export quality (measured by the simple average of the share of manufactured exports in total exports and the share of MHT products in manufactured exports). Productivity has not been included in the set of (industry-specific) indicators underlying the CIP index for reasons of data availability.

Benchmarking industrial performance

A ranking of 155 economies around the world by the CIP index provides useful insights into industrial performance in the new setting of rapid technical change, liberalization and globalization. As a general feature, most mature industrial economies have lost ranks to new entrants. Singapore was the best global performer in 1990 and 2000. Ireland came next, leaping to 2nd place in 2000 from 9th in 1990 and 19th in 1980. Interestingly, Singapore and Ireland followed similar strategies, entering high-tech global value chains and developing strong human capital and infrastructure. The next seven places in 2000 are held by mature industrial countries, led by Switzerland (the leader in 1980). The next entrants (at ranks 10 and 11) are developing countries: Taiwan and the Republic of Korea. Both used very different strategies from Singapore, seeking to build domestic capabilities, constrain inward foreign direct investment and leverage global value chains by arm's length relationships rather than rely heavily on FDI.

Among the newcomers to the CIP index database, the transition economies (22 new entrants) and the Sub-Saharan African (SSA) economies (21 new entrants) are of particular interest. Transition economies span a large range in the CIP index, from Hungary at 22nd to Kyrgyzstan at 121st. The economies of SSA tend to cluster near the bottom of the CIP index, occupying 19 of the last 30 ranks. Also near the bottom is Mongolia, which is in the 148th position, just before Botswana, Ethiopia, Burundi, Central African Republic, Tonga, Comoros and Mali.

According to UNIDO, one of the many factors accounting for sustained success in developing countries appears to be the ability to develop exports by tapping into global value chains. There are two routes to doing this: building strong local capabilities (in domestic enterprises) or attracting export-oriented FDI. The Republic of Korea and Taiwan chose to build domestic capabilities first, while Malaysia chose to rely on FDI – but over time there has been growing convergence between them.

The UNIDO methodology also benchmarks five leading factors that greatly influence competitive industrial performance: skills, technological effort, inward FDI, technology licensing, and modern infrastructure. These structural factors will be further examined in the next section. The idea, as explained in the methodology, is not to fully account national industrial performance, but to capture key influences on industrial performance and to have comparable quantitative data across a wide range of economies.

3.5 Structural factors in competitiveness: technology, skills and FDI

Analytical background

Domestic technological effort[5] and FDI are both vital to the competitive industrial performance, and both need a strong basis of skills (Lall, 2005). Technological effort is needed in all developing countries to implement new technologies efficiently, regardless of the ownership of the factory, and such effort has to build on technologies imported from advanced countries. What difference does FDI make to the transfer and absorption of new technologies and to export competitiveness?

As explained by Lall (2005), access to new technologies takes two broad forms: internalized (from a multinational company to its affiliates) and externalized (between independent firms). While internalized modes necessarily involve MNCs, externalized ones may also involve MNCs selling technologies (they are in fact the largest sellers of technology on license). However, there are other sources of technology: national enterprises without overseas investments, consultants, capital goods producers, research institutions or governments. The sale can take a variety of forms: minority joint ventures, franchising, turnkey projects, sale of equipment, licenses, technical assistance, subcontracting or original equipment manufacturing arrangements. Internalized transfers bring a package of supporting inputs to ensure their efficient deployment. Externalized transfers may involve additional inputs by the technology seller, but generally tend to call for greater learning effort by the recipient.

The MNCs that dominate global FDI are also the main source of industrial innovation. In fact, innovation is often the main factor that allows them to become (and remain) multinational. Despite the growth of technology start-ups, concentration in R&D remains high[6]. As the major innovators, it is not surprising MNCs are also the main sources of technology transfer in non-FDI forms – they choose the mode of transfer to maximize the value of their technological assets, internalizing the most valuable ones and selling older or less profitable ones at arm's length. (Lall, 2005)

Using MNCs to develop local innovative capabilities is possible only if the host countries' skill base is growing, local suppliers are improving their capabilities, technology institutions can provide more advanced services, and so on. This needs active government policies. Moreover, a policy to induce MNCs to enter more advanced activities by offering such inducements as specialized infrastructure and skills can accelerate the upgrading process. With a completely passive policy, MNC exports can remain at low, technologically stagnant levels. Thus, a MNC-dependent export strategy needs a proactive element for dynamic competitiveness.

More importantly, depending on FDI is not a substitute for strengthening domestic capabilities. There are many activities that MNCs do not

[5] There is a widespread belief that «technology» is an activity reserved for developed countries. Developing countries only need to import existing knowledge from them in the form of machinery, equipment, designs, patents and blueprints. In simplified models with efficient markets, all they need to do to tap new technologies efficiently is to liberalize and wait for the right technologies to flow in to suit their factor endowments. No further technological effort is needed (they do not need to «reinvent the wheel»); static comparative advantage is the same as dynamic comparative advantage, and as their factor-price ratios change, their trade structure will adjust automatically and instantaneously. In sum, technology does not raise significant policy issues in developing countries.
This depiction is misleading. Developing countries do not generally «innovate» in the sense of creating new products or processes. They do, however, have to invest in technological effort: to acquire, master, adapt and improve upon existing technologies. This effort is often quite significant. In fact, developing countries often have to undertake greater effort than their counterparts in advanced economies because their absorptive capabilities are much lower. Absorbing technologies is not a trivial or costless task, and industrial success depends on how well the process is managed. Since all countries have access to the same international technical knowledge, a critical determinant of industrial performance is technological «learning» by different countries. It is critical to understand this phenomenon. (Sanjaya Lall, «Is African Industry Competing?», Queen Elizabeth House, University of Oxford, January 2005, QEH Working Paper Series – QEHWPS122).

[6] For instance, for the year 1997, the largest 2% (by employment) of manufacturing companies undertaking R&D in the USA accounted for nearly 80% of industrial R&D spending. (Lall, 2005)

enter, including many locally- oriented ones that tend to be the realms of SMEs. These activities also need efficient local suppliers if they are to go beyond the assembly of imported components: capturing the spillover benefits of foreign presence needs capable local firms. More important, a strong base of national enterprises can lead to broader, deeper and more flexible capabilities, since the technology development process within foreign affiliates may be curtailed as compared to local firms. The very fact that an affiliate can draw upon its parent company for technical information, skills, technological advances, and so on, means that it needs to invest in its own capabilities. This applies particularly to functions like advanced engineering, design or R&D, which MNCs tend to centralize in industrial countries. As they mature industrially, it is imperative for developing countries to undertake these functions locally to support their future comparative advantage[7]. This is why some countries choose to promote technology development in indigenous firms.

Benchmarking technological capabilities

Let's start by benchmarking *skills*. One possible measure is the overall enrollment rates, particularly in the higher level managerial and technical skills needed to handle modern technologies efficiently. One illustration of this is the enrollment rates in tertiary level technical subjects (e.g. in sciences, engineering, mathematics, computing).

Table 3.9 shows the number and rate of student enrollments at the tertiary level in all subjects and technical subjects (sciences, engineering, mathematics, computing) for the year 2000-01. Although enrollment data are not the ideal measure of skills[8], they are nevertheless the only comparable data available and they do show the national base for skill acquisition. The Asian NIEs enroll over 7 times the student proportion per thousand people in technical subjects than the developing world (and over 31 times SSA that has naturally the lowest enrollment rate). The leading three countries in terms of total number of technical enrollments – China (24%), India (16%) and Korea (8%) – account for 48% of the developing world's technical enrollments, the top ten for 77%, and the top twenty for 93%.

In terms of the intensity of technical skill creation (number of enrollments per thousand population), Korea is the word's leader (21.42 students enrolled/1,000), followed far behind by Finland (17.83), Taiwan (16.85), the Russian Federation (16.41), and Singapore (11.92) in the first five places (see table 3.10). The next five places are occupied by mature industrialized countries. The four mature Asian tigers (Hong Kong, Korea, Singapore and Taiwan) and two new Asian tigers (Malaysia and Thailand) are among the first 20 places of the ranking. The last thirty places are mostly occupied by South Asian and SSA countries, with most of the least developed countries clustered at the bottom of the table. The intermediary group spans from New Zealand at 33rd place (6.68) to Costa Rica at 74th (2.05), with Mongolia at the 60th position (4.04).

Figure 3.1 shows tertiary enrollments as a percentage of relevant age group for selected countries of the sample and the leading economies in terms of educational attainments. Note that the average for high-income countries is 61% and 33% for upper middle-income countries. Most of the leading countries in figure 3.1 have high rates: 85% for Finland, 82% for Korea, 68% for the Russian Federation, 65% for Australia, 57% for Spain, 39% for Kazakhstan, 37% for Thailand and 35% for Mongolia (World Bank, *World Development Indicators 2004*). Mongolia offers an interesting case for policy debating: while its industrial and export performance lagged behind that of the new Asian Tigers, its record in terms of educational attainments stood comparison with that of Malaysia or Thailand. Nepal's record is quite understandable for a low-income landlocked country. What is more surprising is the low enrollment figure for China. China in fact is something of an anomaly: its tertiary enrollment record did not matched up to its industrial and export performance; although it has the highest number of tertiary students enrolled in technical subjects, China's skill base appears weak relative to its size, and the country still has some distance to go before it matches the region's leading industrializing economies.

[7] See comments in footnote 4.

[8] They ignore on-the-job learning, other forms of training and quality differences in the education provided.

Table 3.9: Students Enrollments at The Tertiary Level in All Subjects and Technical Subjects, 2000/2001

	Tertiary level enrollments		Enrollments in technical subjects	
Regions/ Groups of countries	Number of tertiary students (Thousands)	Per thousand people	Number of tertiary students in sciences, math., engineering and computing (Thousands)	Per thousand people
Developing countries	51,228.7	12.0	11,184.1	2.6
East Asia	22,253.8	12.6	5,696.6	3.2
4 mature Tigers	4,224.8	53.4	1,481.9	18.7
4 new Tigers	8,094.8	21.8	2,021.6	5.4
China	12,143.7	9.5	2,980.4	2.3
South Asia	11,220.8	8.4	2,134.9	1.6
Latin America	10,271.3	22.6	2,126.4	4.7
Middle East & North Africa (MENA)	5,920.7	22.6	979.2	3.7
Sub-Saharan Africa (SSA)	1,562.1	3.6	247.0	0.6
Transition economies	14,222.2	40.6	3,907.4	11.2
Developed countries	37,938.7	39.1	6,410.8	6.6
Europe	13,247.5	34.2	3,044.9	7.9
North America	14,807.8	47.2	1,869.6	6.0
Japan	3,972.5	31.4	1,243.4	9.8
Australia + New Zealand	1,017.1	44.4	252.9	11.0

Source: UNCTAD (2005), based on UNESCO and Taiwan statistics
Note: Data on tertiary enrolments by subject are not available after 1997. It is assumed here that the share of technical subjects in total tertiary enrolments was the same in 2000/01 as in 1997. For a number of economies in Southeast Europe and the CIS, data are not available at all. In these cases, it is assumed that the shares of technical to total tertiary students were the same as in the economies in Southeast Europe and the CIS for which data are available.

Figure 3.1: Gross enrollment ratio in tertiary education
(% of relevant age group)

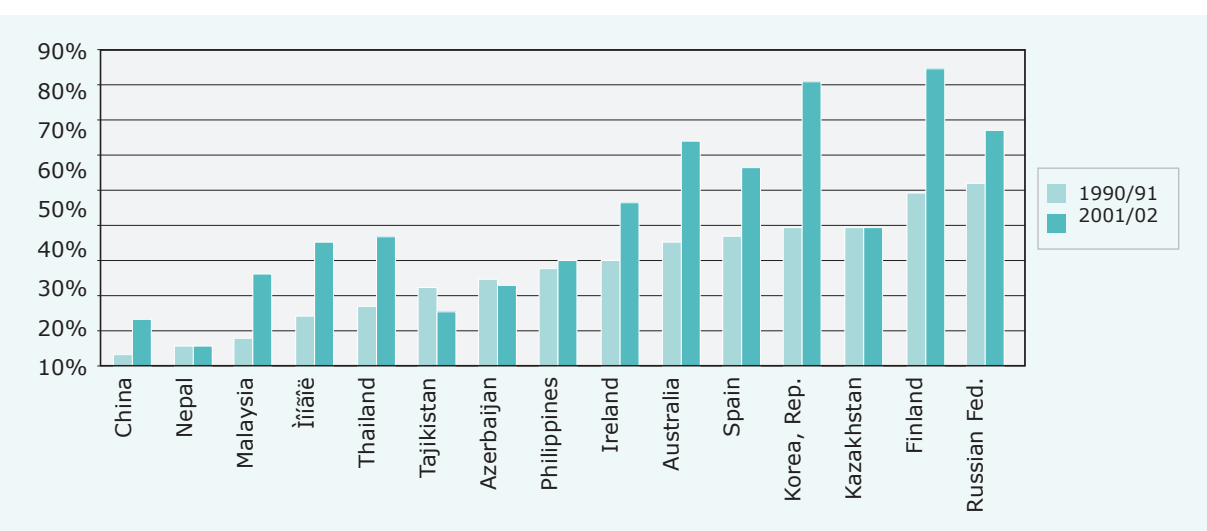


Table 3.10: Tertiary Technical Enrollments 2000/2001
(number of students per 1,000 population)

Rank	Countries	(**)	Rank	Countries	(**)	Rank	Countries	(**)
1	Korea	21.42	36	Colombia	6.31	71	El Salvador	2.38
2	Finland	17.83	37	Austria	6.30	72	Morocco	2.36
3	Taiwan	16.85	38	Estonia	6.29	73	China	2.33
4	Russian Fed.	16.41	39	Slovenia	6.20	74	Costa Rica	2.05
5	Singapore	11.92	40	Bulgaria	6.16	75	Saudi Arabia	1.93
6	Australia	11.91	41	USA	6.07	76	India	1.89
7	Spain	11.63	42	Switzerland	5.93	77	Nicaragua	1.78
8	Ireland	11.55	43	Lebanon	5.91	78	South Africa	1.74
9	Greece	11.42	44	France	5.85	79	Albania	1.64
10	Sweden	10.61	45	Mexico	5.83	80	Qatar	1.50
11	Hong Kong	10.10	46	Jordan	5.49	81	Cameroon	1.16
12	Japan	9.81	47	Kyrgyzstan	5.47	82	Botswana	1.13
13	Portugal	9.44	48	Latvia	5.38	83	Oman	0.96
14	Slovak Rep.	9.26	49	Bolivia	5.36	84	Bangladesh*	0.92
15	Malaysia	8.92	50	Algeria	5.17	85	Mauritius	0.91
16	Ukraine	8.76	51	Netherlands	5.16	86	Zimbabwe	0.83
17	Thailand	8.52	52	Canada	4.91	87	Sri Lanka	0.82
18	Chile	8.36	53	Moldova	4.88	88	Ghana	0.72
19	UK	8.35	54	Belgium	4.76	89	Nepal*	0.68
20	Israel	8.19	55	Iran	4.43	90	Senegal*	0.57
21	Hungary	7.90	56	Egypt	4.26	91	Yemen*	0.56
22	Czech Rep.	7.84	57	Tunisia	4.17	92	Nigeria	0.55
23	Germany	7.75	58	Peru	4.13	93	Zambia*	0.52
24	Kazakhstan	7.73	59	Turkey	4.08	94	Kenya	0.46
25	Belarus	7.64	**60**	**Mongolia**	**4.04**	95	Pakistan	0.45
26	Venezuela	7.63	61	Uruguay	4.00	96	Madagascar*	0.42
27	Romania	7.59	62	Armenia	3.92	97	Eritrea*	0.30
28	Philippines	7.48	63	Cyprus	3.75	98	Ethiopia*	0.28
29	Poland	7.47	64	Tajikistan	3.60	99	Mauritania*	0.26
30	Argentina	7.25	65	Indonesia	3.46	100	Uganda*	0.25
31	Georgia	7.11	66	Paraguay	3.07	101	Tanzania*	0.18
32	Norway	7.09	67	Jamaica	2.88	102	Djibouti*	0.17
33	New Zealand	6.68	68	Brazil	2.75	103	Malawi*	0.03
34	Denmark	6.67	69	Vietnam	2.53	104	Mozambique*	0.01
35	Italy	6.43	70	Honduras	2.48			

Source: UNCTAD (2005), based on UNESCO and Taiwan statistics
(*): *Least developed countries (LDCs).*
(**) Number of tertiary students enrolled in technical subjects (sciences, engineering, mathematics, and computing) per thousand people,

Coming now to *technological effort*, the only available comparative data across regions and countries are formal R&D and patents (the former is an R&D input and the latter R&D output). These indicators are partial, since a large part takes the form of informal effort on the shop floor and supporting quality, engineering, procurement and distribution operations. However, these indicators do provide insights into technological activity, bearing in mind that formal R&D becomes important in developing countries simply for absorbing complex new technologies. Table 3.11 shows regional R&D propensities.

Business enterprise-funded R&D as a share of GDP (the best indicator of technologically useful R&D) is nearly 400 times higher in the mature NIEs than in SSA (the technological laggard region). Asia as a whole accounts for 86% of R&D researchers (scientists and engineers) in the developing world, Latin America for around 10%, and SSA for only 0.3%. The proportion of business firm-funded R&D in total R&D spending is highest in the mature NIEs, followed by the new NIEs, and lowest in Africa.

Another way to benchmark technology is to combine R&D with patents taken out internationally (in this case, in the US). Lall (2003) suggests an indicator of his own (*the Technology Effort Index* shown in table 3.12), ranking a large sample of countries according to a combination of enterprise-funded R&D and patents (though countries at the bottom could not be ranked because they did not undertake meaningful technology effort by either measure).

A final indicator of technological capability is the World Bank's new «*Knowledge Economy Index*» (available at http://info.worldbank.org/etools/kam2005), based on its «*knowledge assessment methodology*» (KAM). According to the Bank, the application of knowledge – as manifested in areas such as entrepreneurship and innovation, R&D, software and design, and in people's education and skill levels – is now recognized to be one of the key sources of growth in the global economy. Countries such as Korea, Malaysia, Finland, China and Costa Rica illustrate the rapid progress that can be made over relatively short periods of time by pursuing coherent strategic approaches to building their country's capabilities to create, access, and use knowledge.

Table 3.11: R&D Propensities and Manpower in Major Country Groups
(latest year available)

Countries/ Regions	Researchers in R&D		Total R&D	Part of R&D (in %)		Part of R&D (as % of GDP)	
	Number (000s)	Per million people	% of GDP	Which goes into pro-ductive sector	… and is funded by business firms	Which goes into pro-ductive sector	… and is funded by business firms
Industrialized economies[a]	2,704.2	1,102	1.94	53.7	53.5	1.043	1.037
Developing economies [b]	1,034.3	514	0.39	13.7	10.5	0.054	0.041
SSA	3.2	83	0.28	0.0	0.6	0.000	0.002
North Africa	29.7	423	0.40	n.a	n.a	n.a	n.a
Latin America	107.5	339	0.45	18.2	9.0	0.082	0.041
Asia (excl. Japan)	894.0	783	0.72	32.1	33.9	0.231	0.244
Mature NIEs	189.2	2,121	1.50	50.1	51.2	0.751	0.768
New NIEs	18.5	121	0.20	27.7	38.7	0.055	0.077
South Asia [c]	145.9	125	0.85	13.3	7.7	0.113	0.065
Middle East	50.5	296	0.47	9.7	11.0	0.045	0.051
China	422.7	350	0.50	31.9	n.a	n.a	n.a
Transition economies [d]	946.2	1,857	0.77	35.7	37.3	0.275	0.288
World (79-84 countries)	4,684.7	1,304	0.92	36.6	34.5	0.337	0.318

Source: Calculated from UNESCO data
[a] USA, Canada, West Europe, Japan, Australia and New Zealand.
[b] Including Middle-East oil states, Turkey, Israel, South Africa, and formally socialist economies in Asia.
[c] India, Pakistan, Bangladesh, and Nepal.
[d] Including Russian Federation.

Table 3.12: Technology Effort Index (1997/98)

Business firm-funded R&D per capita ($)		Patents in US (per 1,000 people)		Technological Effort Index (TEI)			Techn'gy group
Switzerland	859.9	USA	3.297	1	Japan	0.8649	
Japan	858.4	Japan	2.412	2	Switzerland	0.7858	
Sweden	653.9	Switzerland	1.884	3	USA	0.7709	
USA	465.9	Taiwan	1.622	4	Sweden	0.5957	
Germany	418.1	Sweden	1.421	5	Germany	0.4151	
Finland	413.4	Israel	1.275	6	Finland	0.4099	
Denmark	328.4	Germany	1.134	7	Denmark	0.3434	
France	297.6	Finland	1.118	8	Taiwan	0.3173	
Norway	275.5	Canada	1.090	9	Netherlands	0.2743	
Belgium	272.7	Denmark	1.005	10	France	0.2716	
Netherlands	258.8	Netherlands	0.817	11	Israel	0.2712	
Austria	214.4	Belgium	0.699	12	Belgium	0.2645	High
Korea, Rep.	211.2	Korea, Rep.	0.657	13	Canada	0.2488	
Singapore	198.4	France	0.650	14	Norway	0.2344	
UK	174.5	UK	0.601	15	Korea, Rep.	0.2225	
Ireland	152.8	Hong Kong	0.540	16	Austria	0.2022	
Australia	148.0	Austria	0.511	17	UK	0.1926	
Canada	143.7	Norway	0.490	18	Singapore	0.1738	
Israel	134.0	Australia	0.404	19	Australia	0.1470	
Taiwan	122.5	Singapore	0.386	20	Ireland	0.1191	
Italy	90.1	New Zealand	0.356	21	Italy	0.0986	
Slovenia	73.3	Italy	0.305	22	New Zealand	0.0835	
Spain	55.2	Ireland	0.200	23	Hong Kong	0.0829	
New Zealand	50.7	Slovenia	0.076	24	Slovenia	0.0541	
Czech Rep.	32.3	Spain	0.072	25	Spain	0.0431	
Portugal	14.1	Hungary	0.045	26	Czech Rep.	0.0200	
Brazil	13.7	South Africa	0.030	27	Hungary	0.0135	
Greece	13.5	Malaysia	0.017	28	South Africa	0.0121	
South Africa	12.8	Greece	0.016	29	Greece	0.0103	
Hungary	11.3	Bahrain	0.016	30	Portugal	0.0096	
Argentina	8.5	Venezuela	0.013	31	Brazil	0.0087	
Poland	8.3	Russian Fed.	0.012	32	Argentina	0.0067	
Russian Fed.	7.5	Argentina	0.011	33	Malaysia	0.0065	Moderate
Malaysia	6.7	Chile	0.011	34	Russian Fed.	0.0062	
Costa Rica	5.5	Uruguay	0.009	35	Poland	0.0055	
Chile	5.3	Portugal	0.009	36	Chile	0.0047	
Turkey	4.8	Mexico	0.009	37	Costa Rica	0.0041	
Romania	2.5	Czech Rep.	0.008	38	Venezuela	0.0033	
Venezuela	2.3	Saudi Arabia	0.006	39	Turkey	0.0029	
Hong Kong	1.8	Ecuador	0.006	40	Bahrain	0.0024	
Mexico	1.5	Costa Rica	0.006	41	Mexico	0.0022	
Panama	1.4	Brazil	0.005	42	Uruguay	0.0020	
Uruguay	1.1	Jordan	0.004	43	Romania	0.0015	

Table 3.12: Technology Effort Index (1997/98) (cont.)

Business firm-funded R&D per capita ($)		Patents in US (per 1,000 people)		Technological Effort Index (TEI)			Techn'gy group
China	0.9	Poland	0.004	44	Saudi Arabia	0.0009	
Indonesia	0.8	Jamaica	0.004	45	Ecuador	0.0009	
India	0.4	Philippines	0.003	46	Panama	0.0008	
Mauritius	0.3	Thailand	0.002	47	Jordan	0.0008	
Thailand	0.3	Guatemala	0.002	48	China	0.0006	
Egypt	0.2	Colombia	0.002	49	Jamaica	0.0006	
Colombia	0.2	Honduras	0.002	50	Philippines	0.0006	
Jordan	0.2	Bolivia	0.001	51	Indonesia	0.0005	
Guatemala	0.1	Tunisia	0.001	52	Thailand	0.0005	
Algeria	0.1	Sri Lanka	0.001	53	Colombia	0.0004	
Saudi Arabia	0.1	India	0.001	54	India	0.0004	
Peru	0.1	Morocco	0.001	55	Guatemala	0.0003	
Morocco	0.1	China	0.001	56	Honduras	0.0003	
Philippines	0.1	Turkey	0.000	57	Sri Lanka	0.0002	
Honduras	0.1	Indonesia	0.000	58	Bolivia	0.0002	
Nicaragua	0.1	Peru	0.000	59	Mauritius	0.0002	
Sri Lanka	0.1	Kenya	0.000	60	Morocco	0.0002	
Yemen	0.0	Egypt	0.000	61	Tunisia	0.0002	
Tunisia	0.0	Nigeria	0.000	62	Egypt	0.0001	
Malawi	0.0	Pakistan	0.000	63	Peru	0.0001	
Madagascar	0.0	Albania	0.000	64	Algeria	0.0001	
Kenya	0.0	Algeria	0.000	65	Nicaragua	0.0001	Low
Jamaica	0.0	Bangladesh	0.000	66	Kenya	0.0001	
Ecuador	0.0	Cameroon	0.000	67	Nigeria	0.0000	
Albania	0.0	CAR	0.000	68	Pakistan	0.0000	
Bahrain	0.0	El Salvador	0.000	69	Albania	0.0000	
Bangladesh	0.0	Ethiopia	0.000	70	Bangladesh	0.0000	
Bolivia	0.0	Ghana	0.000	71	Cameroon	0.0000	
Cameroon	0.0	Madagascar	0.000	72	CAR	0.0000	
CAR	0.0	Malawi	0.000	73	El Salvador	0.0000	
El Salvador	0.0	Mauritius	0.000	74	Ethiopia	0.0000	
Ethiopia	0.0	Mozambique	0.000	75	Ghana	0.0000	
Ghana	0.0	Nepal	0.000	76	Madagascar	0.0000	
Mozambique	0.0	Nicaragua	0.000	77	Malawi	0.0000	
Nepal	0.0	Oman	0.000	78	Mozambique	0.0000	
Nigeria	0.0	Panama	0.000	79	Nepal	0.0000	
Oman	0.0	Paraguay	0.000	80	Oman	0.0000	
Pakistan	0.0	Romania	0.000	81	Paraguay	0.0000	
Paraguay	0.0	Senegal	0.000	82	Senegal	0.0000	
Senegal	0.0	Tanzania	0.000	83	Tanzania	0.0000	
Tanzania	0.0	Uganda	0.000	84	Uganda	0.0000	
Uganda	0.0	Yemen	0.000	85	Yemen	0.0000	
Zambia	0.0	Zambia	0.000	86	Zambia	0.0000	
Zimbabwe	0.0	Zimbabwe	0.000	87	Zimbabwe	0.0000	

Source: Lall (2003)

The KAM was designed to proxy a country's preparedness to compete in the knowledge economy. It uses more than 80 structural and qualitative variables to measure countries' performance on the four pillars of the development of a knowledge society: (i) economic incentive and institutional regime; (ii) education; (iii) innovation; and (iv) ICT infrastructure. Each variable is normalized on a scale of zero to ten relative to other countries in the comparison group totaling 128 countries. The KAM data also allows to derive country's overall *Knowledge Economy Index* (KEI) and *Knowledge Index* (KI). The KI is the average of the performance of a country in three pillars: education, innovation and ICT infrastructure (it ignores the economic incentive and institutional regime). It thus serves as a useful combination of the factors reviewed earlier, with the addition of an ICT infrastructure variable.

Figures 3.1 and 3.2 below show the *Knowledge Index* scores for East Asia and the main landlocked economies of Asia and Latin America, for 1995 and the most recent available year, the scores ranging between one and ten. The four mature Asian Tigers are well in advance of other Asian countries. Mongolia has a relatively good position, staying ahead of China and Indonesia in the most recent years, while it was behind them in 1995. It has the second highest improvement in the KI since 1995, after Vietnam. Compared to the landlocked countries, and more particularly to Central Asia's landlocked transition economies, Mongolia is the second best performer after Kazakhstan.

Figure 3.2: Knowledge Index - East Asia

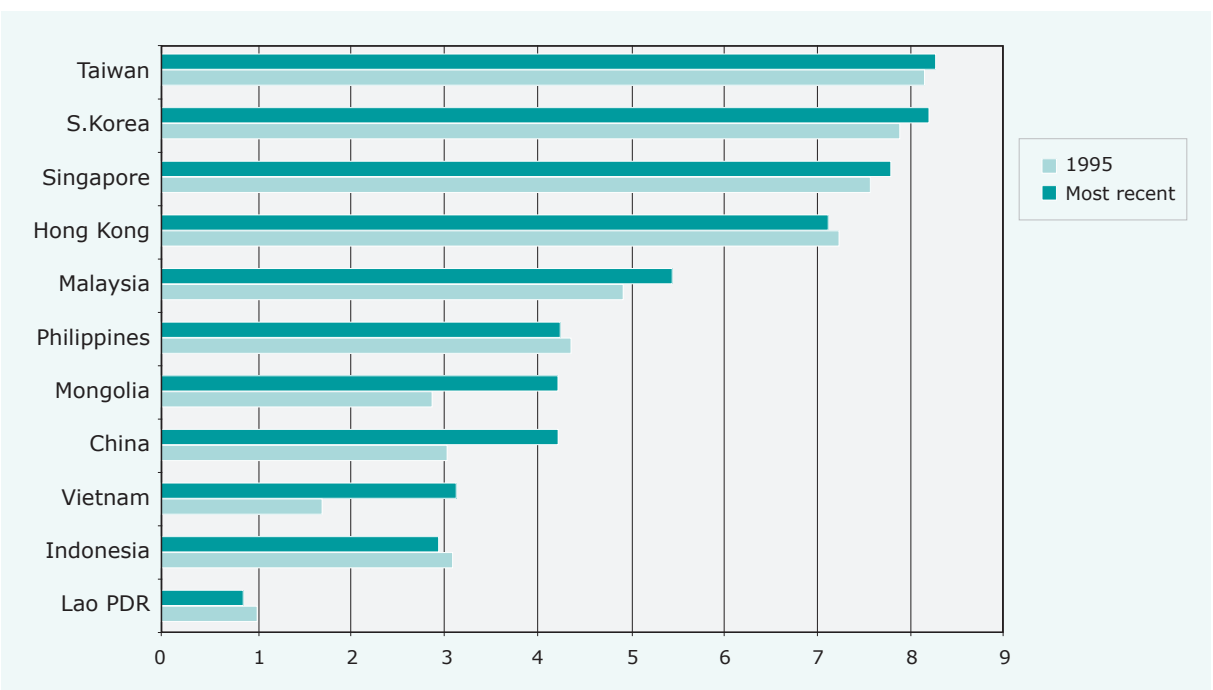


Figure 3.3: Knowlegde Index - Landlocked Economies

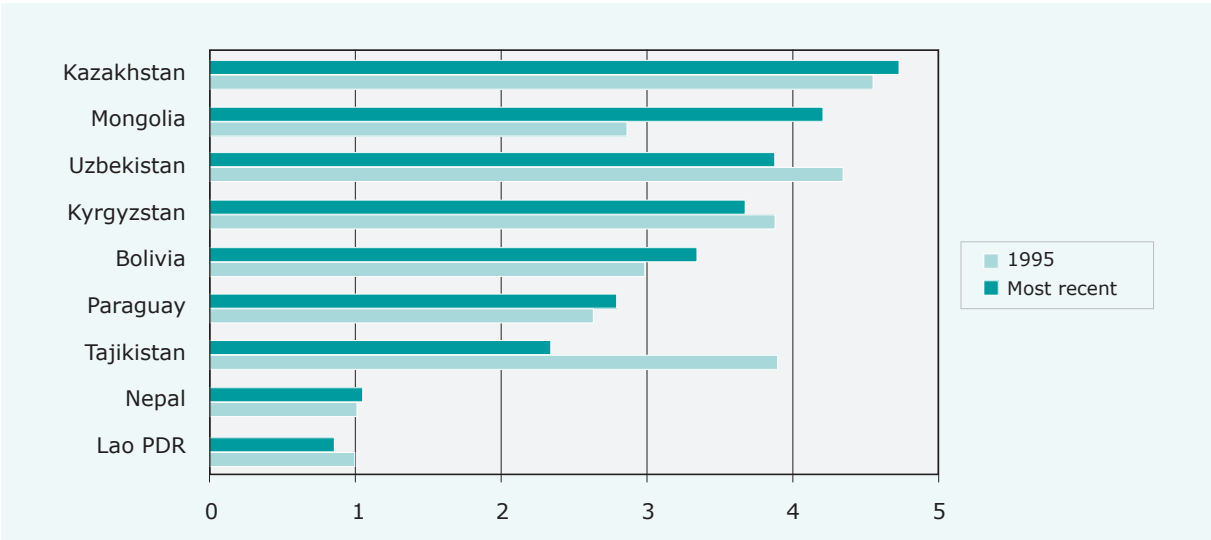


Table 3.13: FDI Inflows by Region and Country, 2000-2004

Regions/countries	FDI inflows (millions of dollars)			As % of global FDI		As % of developing word FDI	
	2000	2003	2004	2000	2004	2000	2004
Developed economies	1,107,987	442,157	380,022	79.82	58.63	-	-
Developing economies	252,459	172,625	243,808	18.19	37.62	100.00	100.00
North Africa	2,918	5,262	5,270	0.21	0.81	1.16	2.16
SSA	5,810	12,743	12,821	0.36	1.98	2.30	5.26
South America	57,852	24,357	37,872	4.17	5.84	22.92	15.53
Other LA & Caribbean	39,684	22,550	29,654	2.86	4.57	15.72	12.16
West Asia	1,494	6,522	9,840	0.11	1.52	0.59	4.04
Central Asia	1,890	6,288	10,581	0.14	1.63	0.75	4.34
South, East & S/E Asia of which:	142,683	94,755	137,705	10.28	21.25	56.52	56.48
China	40,715	53,505	60,630	2.93	9.35	16.12	24.86
Hong Kong	61,939	13,624	34,035	4.46	5.25	24.53	13.96
India	2,319	4,269	5,335	0.17	0.82	0.92	2.19
Malaysia	3,788	2,473	4,624	0.27	0.71	1.50	1.90
Mongolia	13	132	147	0.00	0.02	0.00	0.06
Philippines	1,345	347	469	0.09	0.07	0.53	0.19
Singapore	17,217	9,331	16,060	1.24	2.48	6.82	6.59
Thailand	3,350	1,952	1,064	0.24	0.16	1.33	0.44
Vietnam	1,289	1,450	1,610	0.09	0.25	0.51	0.66
The Pacific	128	146	67	0.01	0.01	0.05	0.03
Central/Eastern Europe	27,508	17,818	24,316	1.98	3.75	-	-
World	1,387,953	632,599	648,146	100.00	100.00	-	-

Source: World Investment Report 2005 and 2004, UNCTAD.

Foreign direct investment (FDI)

Mongolia has only recently opened up to FDI, and foreign investors appear to have taken an increasing interest in the country, as highlighted by the sustained growth of FDI inflows since the end of the last decade: from $19 million in 1998, FDI inflows jumped to $30 million in 1999, $54 million in 2000, $78 million in 2002, $132 million in 2003 and 147 million in 2004. From an insignificant base in 2000, Mongolia's share in global FDI inflows rose to a more appreciable 0.02% in 2004; its inward FDI share in the developing world also increased significantly (see table 3.13).

On account of a strong increase in FDI flows to developing countries, the year 2004 saw a slight rebound in global FDI after three years of declining flows. At $648 billion, world FDI inflows were 2% higher in 2004 than in 2003. Inflows to developing countries surged by around 41%, to $244 billion, but developed countries as a group experienced a 14% drop in their inward FDI. As a result, the share of developing countries in world FDI inflows increased to nearly 38% (from 27% in 2003), while the share of Central & Eastern Europe was 4% (up from nearly 3% in 2003).

According to the *World Investment Report 2005* (UNCTAD, 2005), many factors help to explain why the growth of FDI was particularly pronounced in developing countries in 2004. Intense competitive pressures in many industries are leading firms to explore new ways of improving their competitiveness. Some of these ways are by expanding operations in the fast-growing markets of emerging economies to boost sales, and by rationalizing production activities with a view to reaping economies of scale and lowering production costs. Higher prices for many commodities have further stimulated FDI to countries that are rich in natural resources such oil and minerals. Provided economic growth is maintained, the prospects for a further increase in global FDI flows in 2005 and 2006 are promising.

Table 3.14: Ranking by the Inward FDI Performance Index, 2001-2003

Rank 2001-03	Countries	Rank 2000-02	Rank 1999-01
1	Belgium/ Luxemburg	(1)	(1)
2	Brunei	(4)	(7)
3	Azerbaijan	(13)	(35)
4	Ireland	(3)	(5)
5	Angola	(5)	(3)
6	Singapore	(6)	(4)
7	Gambia	(14)	(13)
8	Kazakhstan	(12)	(15)
9	Hong Kong	(2)	(2)
10	Estonia	(21)	(22)
11	Bolivia	(9)	(11)
12	Slovakia	(8)	(28)
13	Czech Rep.	(10)	(12)
14	Trinidad/Tobago	(16)	(16)
15	Mongolia	(28)	(45)
16	Netherlands	(7)	(8)
17	Nicaragua	(17)	(14)
18	Namibia	(19)	(32)
19	Croatia	(26)	(24)
20	Jamaica	(22)	(23)
...	...	...	...
130	Nepal	(134)	(131)
131	Burkina Faso	(124)	(123)
132	Japan	(131)	(130)
133	Bangladesh	(128)	(127)
134	Haiti	(129)	(124)
135	Zimbabwe	(133)	(126)
136	Iran	(135)	(132)
137	Kuwait	(136)	(133)
138	Saudi Arabia	(138)	(136)
139	Indonesia	(139)	(138)
140	Suriname	(140)	(140)

Source: WIR 2004 (CNUCED, 2004)
Note: UNCTAD calculations, data covering 140 economies.

In the *World Investment Report 2004,* UNCTAD has developed two indices for benchmarking inward FDI performance and potential. The *Inward FDI Performance Index* is a measure of the extent to which host countries receive inward FDI. The Index ranks countries by the amount of FDI they receive relative to their economic size, calculated as the ratio of a country's share in global FDI inflows to its share in global GDP. A value greater than one indicates that the country attracts more FDI in proportion to its economic size; a value below one shows that it receives less (a negative value indicates that foreign investors disinvested in that period). Thus, a higher index implies success in the competition (explicit or implicit) to attract FDI[9]. By this measure, Mongolia ranked among the top 20 best performers, in terms of its competitiveness in attracting inward FDI (see table 3.14). Of the top 20 performers, 3 were developed countries, 2 Asian mature NIEs, 6 transition economies, and 9 other developing countries. Many high performers in the developing and transition economies were relatively small, with lumpy FDI inflows in resource-based activities or privatization.

The *Inward FDI Potential Index* uses 12 structural variables to derive countries' potential for attracting FDI. By this index, the USA, Norway and the UK occupied respectively the first three places of the ranking. Among the top 25 leading economies, Ireland and Qatar were the two countries showing biggest improvements in rank. The leading economies in the *Potential Index* were, as for the previous period, developed countries, the four Asian Tigers and (in the period 2000-2002) two oil-rich economies from West Asia. China (not shown in table 3.15), the largest recipient of FDI in the developing world, was 39th by FDI potential ranking.

A comparison between national performance according to the FDI *Potential and Performance* indices yields useful insights in terms of the factors that may cause a discrepancy between actual FDI inflows and the structural variables that affect FDI. Benchmark countries can be grouped according to a matrix divided into four quadrants (see table 3.16):

- *Front-runners:* countries with high FDI potential and performance;
- *Above potential:* countries with low FDI potential but high FDI performance;
- *Below potential:* countries with high FDI potential with low FDI performance;
- *Under-performers:* countries with low FDI potential and performance.

Table 3.15: Top 25 Rankings by the Inward FDI Potential Index, 1988-2002

Rank 2000-02	Countries	Rank 1996-98	Rank 1988-90
1	USA	(1)	(1)
2	Norway	(3)	(4)
3	UK	(5)	(3)
4	Singapore	(2)	(12)
5	Canada	(4)	(2)
6	Belgium/Luxemburg	(8)	(10)
7	Ireland	(18)	(24)
8	Qatar	(20)	(22)
9	Germany	(6)	(7)
10	Sweden	(7)	(5)
11	Netherlands	(9)	(9)
12	Hong Kong	(14)	(17)
13	Finland	(13)	(8)
14	France	(10)	(6)
15	Iceland	(19)	(15)
16	Japan	(12)	(13)
17	UAE	(11)	(29)
18	Korea, Rep.	(21)	(20)
19	Denmark	(16)	(16)
20	Switzerland	(17)	(11)
21	Taiwan	(24)	(21)
22	Australia	(15)	(14)
23	Israel	(25)	(27)
24	Austria	(22)	(19)
25	Spain	(26)	(25)

Source: WIR 2004 (UNCTAD, 2004)
Note: UNCTAD calculations, data covering 140 economies

[9] In fact, the Index captures the influence of factors other than market size on FDI flows, on the grounds that size is only the «baseline» for attracting investment. These other factors are diverse, ranging from the business climate to infrastructure, skills and technologies, and opportunities for participating in privatization or the effectiveness of FDI promotion.

As explained in the *Word Investment Report 2004*, there are no real surprises for the first and last groups. The first group *(front-runners)* includes several developed, newly industrializing and advanced transition economies, as well as a few developing countries. The last group *(under-performers)* has poor (or unstable) economies, but it also includes countries affected by economic shocks such as Argentina and Indonesia. It too has some large economies such as India and Nigeria, and resource-rich countries like Venezuela, which, for various reasons, are performing below their economic potential. In policy terms, the first group has to ensure its continuing success and the latter group, to boost its performance in both attracting FDI and enhancing its potential.

The other two groups are of more interest. The *above-potential* countries are «hitting above their weight» in drawing more FDI than their potential warrants, and the *below-potential* countries are doing the opposite. The above-potential group of countries should be concerned about raising their potential if they are to sustain past FDI performance, while the *below-potential* group should address the shortcomings that prevent their structural FDI potential from being realized. The *below-potential* countries include such economies as the USA, Australia, Egypt, Italy, Japan, the Republic of Korea, Taiwan, and Thailand.

Table 3.16: Matrix of Inward FDI Performance and Potential, 2000-2002

	HIGH FDI PERFORMANCE			LOW FDI PERFORMANCE	
HIGH FDI POTENTIAL	Front-runners			Below potential	
	Bahamas	Estonia	Mongolia	Australia	Norway
	Belgium	Finland	Netherlands	Austria	Oman
	Botswana	France	New Zealand	Bahrain	Philippines
	Brazil	Germany	Panama	Belarus	Qatar
	Brunei	Guyana	Poland	Egypt	Korea, Rep.
	Bulgaria	Hong Kong	Portugal	Greece	Russian Fed.
	Canada	Hungary	Singapore	Iceland	Saudi Arabia
	Chile	Ireland	Slovakia	Iran	South Africa
	China	Israel	Slovenia	Italy	Taiwan
	Costa Rica	Jordan	Spain	Japan	Thailand
	Croatia	Latvia	Sweden	Kuwait	UEA
	Cyprus	Lithuania	Switz'land	Lebanon	USA
	Czech Rep.	Malaysia	Trinidad	Libya	
	Denmark	Malta	UK		
	Dominican R.	Mexico	Vietnam		
LOW FDI POTENTIAL	Under-performers			Above potential	
	Algeria	India	Rwanda	Albania	Morocco
	Argentina	Indonesia	Senegal	Angola	Mozambique
	Bangladesh	Kenya	Sierra Leone	Armenia	Namibia
	Benin	Kyrgyzstan	Sri Lanka	Azerbaijan	Nicaragua
	Burkina Faso	Madagascar	Suriname	Bolivia	Macedonia
	Cameroon	Malawi	Syria	Colombia	Moldova
	Cote d'Ivoire	Myanmar	Turkey	Congo	Sudan
	Congo, Rep.	Nepal	Ukraine	Ecuador	Togo
	El Salvador	Niger	Uruguay	Gambia	Tunisia
	Ethiopia	Nigeria	Uzbekistan	Georgia	Uganda
	Gabon	Pakistan	Venezuela	Honduras	Tanzania
	Ghana	Papua N. G.	Yemen	Jamaica	
	Guatemala	Paraguay	Zambia	Kazakhstan	
	Guinea	Peru	Zimbabwe	Mali	
	Haiti	Romania			

Source: WIR 2004 (UNCTAD, 2004)

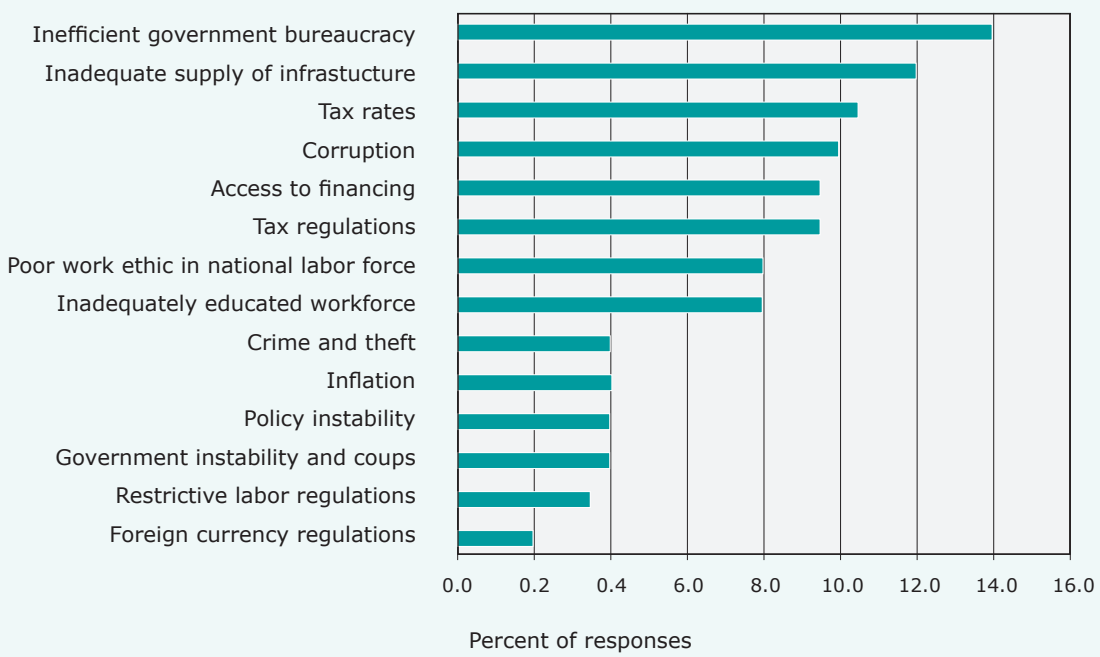
One important reason for the sustained rise in investment interest in Mongolia is its improved policies: trade and FDI liberalization, better macro policies and greater socio-political stability. Moreover, the Mongolian private sector has grown considerably since 1990, with more than 90% of Mongolian enterprises now being privately owned. This achievement is the result of nearly 15-year-long program of privatization and creation of an enabling environment generally supportive of new private investment. Although emphases and priorities of successive governments have differed, policy to open the economy to private sector entrepreneurship has been consistent. Assuming that these improvements continue, the rise in interest is likely to be sustained.

3.6 Business environment

The Mongolian business environment is still handicapped by major impediments to competitiveness. The USAID-sponsored *Economic Policy Reform & Competitiveness Project* has subcontracted with Human Fortis Co. Ltd, a local consulting firm, to conduct a national survey of 105 business executives during January-March 2005. The survey identified the major impediments for doing business in Mongolia as follows (see table 3.17):

In the view of Mongolian business executives, inefficient government bureaucracy, inadequate supply of infrastructure, tax rates, corruption, and tax regulations are among the top five most problematic factors.

Table 3.17: The Most Problematic Factors for Doing Business in Mongolia



Source: National Survey of 105 business executives, January-March 2005

3.7 Conclusions

As can be seen, industrial performance is influenced by a range of factors, including the macroeconomic environment, the overall investment climate and business environment, government policies and regulations, FDI, political and social stability, supporting institutions, skills, technologies, infrastructure, and so on. This study focuses on the key structural factors which are directly relevant to building industrial/technological capabilities.

The study confirms findings around the world that the economies which performed best in the CIP index were also those which upgraded the most their technological capabilities: they spent the most on R&D by manufacturing enterprises and on royalties; they also possessed the best modern physical infrastructure, attracted the most inward FDI, and had the most educated workforce. It is quite understandable that, for a low-income and landlocked country, Mongolia's industrial and export performance lagged behind those high-flying countries, but one thing has emerged from the study: Mongolia's record in terms of educational attainments stood comparison with that of Malaysia and/or Thailand. This means that the potential for a rapid build-up of industrial/technological capabilities exists inside Mongolia, and this potential is quite substantial, in comparison with other countries at the stage of development (Nepal, Lao PDR, for example).

Against this background, a gradual and timely diversification of the manufacturing sector towards the production of a selected number of higher technology goods and exports can help Mongolia prepare for the future, as well as accelerate innovation and learning, and generate externalities for the rest of the economy. For sustained industrial development, reliance on static endowments such as primary resources and/or low-cost labor is a good way to start, but this should be then accompanied by building and enhancing technological capabilities to produce technology-intensive manufactures. Many previous studies have shown that Mongolia has not yet exploited the full potential of their agro-industries. They need to move up the value chains.

4 MEASURING SECTORAL COMPETITIVENESS

For industrialists, the study of sectoral competitiveness is more meaningful than the study of national competitiveness – a country may not be very competitive overall but have sectors that are highly competitive in international markets. Sectoral analysis requires highly disaggregated statistics which are not always available. It also requires specialized knowledge of the technology, human resources and production trends which are specific to the sector in question. The methodology proposed here provides a straightforward tool for (and an innovative approach to) the study of sectoral competitiveness.

Analyzing market positioning

There are many criteria for the selection of sectors with competitive potential. One straightforward technique is the analysis of market positioning. Such an analysis is based on analyzing the trends in the shares of a country's exports in the dynamic or stagnant products in world trade and the country's overall competitive position in whether it is gaining or losing market share (see box 4.1). The key questions are: how attractive are the country's exports; are they growing at a faster or slower rate than the average in the world? What is the market share of such exports and is it increasing or decreasing during the period? We propose to illustrate such analysis for Mongolia and Malaysia.

Let's start first with the country's competitive position. Table 4.1 shows Mongolia's main exports for the years 1996 and 2003, classified by their trade value in 2003. As can be expected, Mongolian exports are concentrated on a small range of products: the first two categories – «*ores and concentrates of base metal*» (SITC 287) and «*non-monetary gold*» (SITC 971) – accounted for more than half of its total exports in 2003, the top 10 for 90%, and the top 20 for 97%. The export categories have exhibited great disparity in growth rates, as the export process has been disrupted in the early 1990s, and the export of many products (such as leather) must re-start from a very low base since 1996. Table 4.1 also calculates the world market shares of Mongolia's exports for the years 1996 and 2003. The market share changes (gains/losses) provide indications as to the country's export competitive position.

Box 4.1: Market Positioning Classification

Market positioning analysis leads to the classification of exports into four groups:

Table 4.1: Market positioning classification

	Country's competitive position	
Share of country's exports in wld trade	Falling (market share losses)	Rising (market share gains)
Rising (dynamic products)	Weakness "UNDERACHIEVERS"	Optimal "CHAMPIONS"
Falling (stagnant products)	Restructuring "DECLINING SECTORS"	Vulnerable "ACHIEVERS IN ADVERSITY"

- The "champions" are those exports with strong compe-titiveness (e.g., rising world market shares) in dynamic products that are growing faster than total trade. This is the most desirable, or optimal, export positioning.
- The "underachievers" are exports in decline (falling market share) in dynamic products. This is the weakest market position, as it shows the inability of the country to develop advantages in dynamic products.
- The "achievers in adversity" are exports with rising market share in non-dynamic products. This means vulnerable positioning, since competitive advantages are concentrated in areas where they may not yield high growth rates.
- The "declining sectors" are sectors that are losing market shares in non-dynamic products. This is a relatively desirable category, since it shows restructuring away from a weak position and in fact, amounts to a strategic retreat. However, if this group is very large, it could trigger a weak overall export structure.

Analyzing the trends in the shares of a country's export in the dynamic or stagnant products in world trade will proceed with the identification of the most dynamic exports in the world during a particular period and the review of the same exports for the country in question. Table 4.2 shows the world's trade of 236 export categories sorted out according to their growth rates between 1996 and 2003. Among the world's 78 fast-growing product categories (growth rates higher than the world's average rate of 4.75% p.a.), Mongolia has got 4 (namely SITC 845, 334, 846 and 843), whose exports grew much higher, compared to the world's rates. These are considered dynamic sectors for which Mongolia is already positioned in global markets. However, the share of these export categories in the international market is still minimal (just a few hundredths of percent), which can by no means influence the country's competitive performance. The product category for which Mongolia has the highest market share is «*Wool and other animal hair*» (1.46%), but it falls in the group of declining sectors (-5.76% growth rate) of world trade, and its exports has diminished in importance, from $78 million in 1996 to $47 million in 2003.

Figure 4.1 illustrates the analysis of market positioning of the top 20 exports for Mongolia. The size of the bubble shows the value of the export category, and the position in the quadrant its relative positioning. There is a horizontal line representing the average rate of growth of world exports. There are few «champions» in Mongolia as compared to Malaysia, and the dominant one is «non-monetary gold», a special transaction (excluded from the technology-based classification of manufactures) facing volatile markets. Other champions are based on «leather» (classified as LT manufacture) and «animals, live, n.e.s.» (a special transaction). Five other export categories just at the limit between the «champions» and the «underachievers» are: «undergarments, knitted or crocheted» (LT), «petroleum products, refined» (RB), «coal» (PP), «petroleum oils, crude» (PP), and «copper» (PP). In Malaysia, by contrast, there are a large number of champions, and most of these are medium and high-tech products. The Mongolian market positioning is not very promising as far as manufactured products go.

Table 4.1: Mongolia's Export Competitive Position, 2003 versus 1996

Reporter Name	Partner Name	Nr	Prodt	Product Name	Country Trade Value ($ '000)		% country	%p.a. growth	World Trade Value ($ '000)		MS	MS	MS change
					1996	2003	2003	1996-03	1996	2003	1996	2003	1996-03
Mongolia	World		Total	Total Trade	424,267	615,866	100.00	5.47	5,154,820,491	5,517,274,578	0.0082	0.0112	0.0029
		1	287	Ores and concentrates of base metal	219,480	179,037	29.07	-2.87	18,320,712	19,922,787	1.1980	0.8987	-0.2993
		2	971	Gold, non monetary		139,877	22.71	...	26,761,267	30,135,462	0.0000	0.4642	0.4642
		3	611	Leather	0	47,354	7.69	...	15,961,306	18,404,778	0.0000	0.2573	0.2573
		4	268	Wool and other animal hair (exclude)	78,564	47,212	7.67	-7.02	4,912,154	3,243,079	1.5994	1.4558	-0.1436
		5	845	Outer garments and other articles, k	9,420	42,527	6.91	24.03	36,900,901	59,177,194	0.0255	0.0719	0.0463
		6	843	Outer garments, women's, of textile	4,228	32,971	5.35	34.10	40,524,079	56,453,269	0.0104	0.0584	0.0480
		7	278	Other crude minerals	23,160	21,607	3.51	-0.99	7,221,630	7,942,306	0.3207	0.2721	-0.0486
		8	842	Outer garments, men's, of textile fa	8,830	15,167	2.46	8.03	30,719,446	37,433,642	0.0287	0.0405	0.0118
		9	844	Undergarments of textile fabrics	3,184	13,712	2.23	23.19	10,664,420	11,930,124	0.0299	0.1149	0.0851
		10	011	Meat, edible meat offals, fresh, chi	5,953	13,469	2.19	12.37	40,089,963	44,713,438	0.0148	0.0301	0.0153
		11	846	Undergarments, knitted or crocheted	296	11,424	1.86	68.53	26,060,438	39,075,823	0.0011	0.0292	0.0281
		12	211	Hides and skins (except furskins),	22,111	7,146	1.16	-14.90	5,638,385	5,444,930	0.3922	0.1312	-0.2609
		13	322	Coal, lignite and peat	14	5,858	0.95	137.28	20,615,297	22,412,977	0.0001	0.0261	0.0261
		14	291	Crude animal materials, n.e.s.	6,244	5,613	0.91	-1.51	3,740,846	3,942,958	0.1669	0.1423	-0.0246
		15	333	Petrol. oils, crude, & c.o. obtain. Fro	0	4,547	0.74	...	192,714,914	264,096,293	0.0000	0.0017	0.0017
		16	334	Petroleum products, refined	111	3,474	0.56	63.55	103,243,443	157,882,269	0.0001	0.0022	0.0021

Table 4.1: Mongolia's Export Competitive Position, 2003 versus 1996 (cont.)

Reporter Name	Partner Name	Nr	Prodt	Product Name	Country Trade Value ($ '000)		% coun-try	%p.a. growth	World Trade Value ($ '000)		MS	MS	MS change
					1996	2003	2003	1996-03	1996	2003	1996	2003	1996-03
Mongolia	World	17	672	Ingots and other primary forms, of i	2,823	3,071	0.50	1.21	25,846,896	34,166,524	0.0109	0.0090	-0.0019
		18	682	Copper	1	2,378	0.39	198.73	31,563,980	32,103,105	0.0000	0.0074	0.0074
		19	941	Animals, live, n.e.s., incl. zoo-anima	7	1,867	0.30	122.88	355,707	479,766	0.0019	0.3892	0.3872
		20	723	Civil engineering & con-tractors pla	357	1,820	0.30	26.20	32,993,956	44,833,225	0.0011	0.0041	0.0030
				SUB-TOTAL 20 FIRST ITEMS	384,782	600,130	97.44	5.99	674,849,740	893,793,949	0.0570	0.0671	0.0101
		21	653	Fabrics, woven, of man-made fibres	8	1,579	0.26	112.32	35,247,330	30,551,014	0.0000	0.0052	0.0051
		22	792	Aircraft & associated equipment and	39	1,165	0.19	62.72	77,273,478	106,240,556	0.0000	0.0011	0.0010
		23	896	Works of art, collectors pieces & an	4	1,120	0.18	127.33	5,951,592	9,607,718	0.0001	0.0117	0.0116
		24	659	Floor coverings, etc.	94	964	0.16	39.53	9,232,866	9,774,852	0.0010	0.0099	0.0089
		25	288	Non-ferrous base metal waste	3,198	898	0.15	-16.59	7,422,627	9,240,521	0.0431	0.0097	-0.0334
		26	282	Waste and scrap metal of iron or st	8,157	892	0.14	-27.11	6,626,024	12,345,942	0.1231	0.0072	-0.1159
		27	057	Fruit & nuts(not include. oil nuts),	35	860	0.14	58.31	27,137,537	34,847,593	0.0001	0.0025	0.0023
		28	635	Wood manufactures, n.e.s.	32	751	0.12	57.09	14,868,576	20,650,956	0.0002	0.0036	0.0034
		29	892	Printed matter	61	658	0.11	40.36	28,359,285	37,294,535	0.0002	0.0018	0.0015
		30	678	Tubes, pipes and fittings, of iron or	190	576	0.09	17.19	22,750,228	25,843,047	0.0008	0.0022	0.0014
				SUB-TOTAL FIRST 30 ITEMS	396.599	609,595	98.98	6.33	909,719,283	1,190,190,683	0.0436	0.0512	0.0076

Source; UN Comtrade

Table 4.2: Mongolia's Position Against the World's 78 Most Dynamic Export Items, 1996-2003

Nr	Pro duct	Product Name	World Trade				Mongolia's 2003 exports	
			Value ($ '000)	Value ($ '000)	% p.a. growth	% share of total	% p.a. growth	World MS (%)
			1996	2003	1996-03	2003	1996-03	2003
	To-tal	Total Trade	5,154,820,491	7,134,537,415	4.75	100.00		
1	871	Optical instruments and apparatus	6,096,175	20,189,563	18.66	0.28		
2	541	Medicinal and pharma-ceutical produc	77,313,098	200,483,797	14.58	2.81		
3	289	Ores & concentrates of precious met	1,308,816	2,867,210	11.85	0.04		
4	681	Silver, platinum & oth. metals of the	6,195,441	13,178,387	11.39	0.18		
5	341	Gas, natural and manu-factured	47,355,494	97,741,024	10.91	1.37		
6	265	Vegetable textile fibres and waste	346,048	709,825	10.81	0.01		
7	763	Gramophones, dictating, sound recorde	20,888,111	42,636,605	10.73	0.60		
8	244	Cork, natural, raw & waste (includ. In	129,732	258,849	10.37	0.00		
9	514	Nitrogen-function compounds	19,468,689	38,540,707	10.25	0.54		
10	551	Essential oils, perfume and flavour	6,463,314	12,227,473	9.54	0.17		
11	872	Medical instruments and appliances	20,117,704	37,907,875	9.47	0.53		
12	714	Engines & motors, non-electric	28,530,360	53,328,483	9.35	0.75		
13	282	Waste and scrap metal of iron or st	6,626,024	12,345,942	9.30	0.17		
14	111	Non alcoholic beverages, n.e.s.	4,447,527	8,162,450	9.06	0.11		
15	764	Telecommunications equipment and pa	128,221,177	226,281,979	8.45	3.17		
16	335	Residual petroleum prod-ucts, n.e.s. & r	6,426,113	11,218,501	8.29	0.16		
17	515	Organo-inorganic and heterocyclic c	29,425,917	50,296,324	7.96	0.70		
18	658	Made-up articles, wholly/ chiefly of	13,680,712	23,286,471	7.89	0.33		
19	884	Optical goods, n.e.s.	13,037,513	22,178,039	7.89	0.31		
20	553	Perfumery, cosmetics and toilet prep	20,118,814	33,661,478	7.63	0.47		
21	899	Other miscellaneous manufactured ar	19,858,424	32,900,611	7.48	0.46		
22	791	Railway vehicles & associated equip	7,172,100	11,850,523	7.44	0.17		
23	351	Electric current	8,318,160	13,439,916	7.09	0.19		

Table 4.2: Mongolia's Position Against the World's 78 Most Dynamic Export Items, 1996-2003 (cont.)

Nr	Pro duct	Product Name	World Trade				Mongolia's 2003 exports	
			Value ($ '000)	Value ($ '000)	% p.a. growth	% share of total	% p.a. growth	World MS (%)
			1996	2003	1996-03	2003	1996-03	2003
24	896	Works of art, collectors pieces & an	5,951,592	9,607,718	7.08	0.13		
25	585	Other artificial resins and plastic	1,222,641	1,967,615	7.03	0.03		
26	323	Briquettes, coke and semi-coke of co	2,200,684	3,541,096	7.03	0.05		
27	**845**	**Outer garments and other articles, knit**	**36,900,901**	**59,177,194**	**6.98**	**0.83**	**24.03**	**0.0719**
28	245	Fuel wood (excluding wood waste) an	269,589	430,319	6.91	0.01		
29	781	Passenger motor cars, for transport	246,859,068	393,323,501	6.88	5.51		
30	786	Trailers & other vehicles, not motor	9,392,990	14,774,767	6.68	0.21		
31	821	Furniture and parts thereof	49,439,869	76,949,245	6.52	1.08		
32	718	Other power generating machinery an	5,160,338	8,023,883	6.51	0.11		
33	759	Parts of and accessories suitable f	103,953,198	160,871,067	6.44	2.25		
34	074	Tea and mate	1,889,065	2,920,357	6.42	0.04		
35	774	Electric apparatus for medical purpose	13,127,348	20,147,935	6.31	0.28		
36	761	Television receivers	24,386,923	37,315,006	6.26	0.52		
37	**334**	**Petroleum products, refined**	**103,243,443**	**157,882,269**	**6.26**	**2.21**	**63.55**	**0.0022**
38	893	Articles of materials described in	46,065,838	69,887,155	6.14	0.98		
39	784	Parts & accessories of 722--,781--,	117,855,312	178,799,597	6.14	2.51		
40	628	Articles of rubber, n.e.s.	9,551,944	14,469,675	6.11	0.20		
41	883	Cinematograph film, exposed-develop	378,879	572,430	6.07	0.01		
42	075	Spices	1,778,817	2,685,689	6.06	0.04		
43	554	Soap, cleansing and polishing prepar	11,957,819	18,048,512	6.06	0.25		
44	582	Condensation, polycondensation & pol	32,699,463	49,129,467	5.99	0.69		
45	**846**	**Under garments, knitted or crocheted**	**26,060,438**	**39,075,823**	**5.96**	**0.55**	**68.53**	**0.0292**
46	772	Elect. app. such as switches, relays, f	68,802,938	103,148,619	5.96	1.45		
47	874	Measuring, checking, analysing instruments	56,669,553	84,786,105	5.92	1.19		
48	776	Thermionic, cold & photo-cathode val	194,330,563	289,734,982	5.87	4.06		
49	533	Pigments, paints, varnishes & related	19,710,316	29,286,997	5.82	0.41		

Table 4.2: Mongolia's Position Against the World's 78 Most Dynamic Export Items, 1996-2003 (cont.)

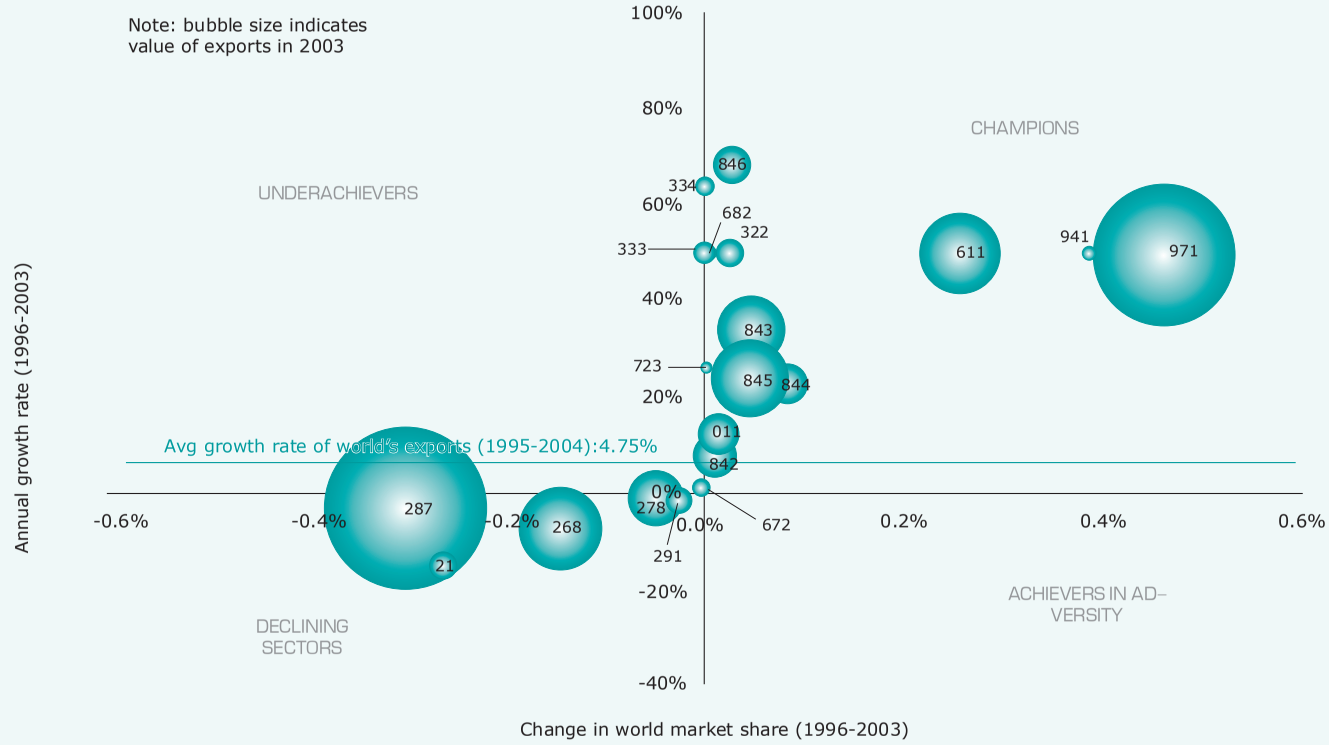
Nr	Pro duct	Product Name	World Trade				Mongolia's 2003 exports	
			Value ($ '000)	Value ($ '000)	% p.a. growth	% share of total	% p.a. growth	World MS (%)
			1996	2003	1996-03	2003	1996-03	2003
50	683	Nickel	5,302,710	7,805,619	5.68	0.11		
51	598	Miscellaneous chemical products, n.e	37,398,286	54,920,749	5.64	0.77		
52	812	Sanitary, plumbing, heating, lighting	15,985,764	23,438,871	5.62	0.33		
53	743	Pumps & compressors, fans & blowers,	33,937,873	49,568,928	5.56	0.69		
54	696	Cutlery	4,203,342	6,100,179	5.46	0.09		
55	633	Cork manufactures	1,021,486	1,480,081	5.44	0.02		
56	664	Glass	14,069,329	20,357,146	5.42	0.29		
57	697	Household equipment of base metal, n	11,404,774	16,497,484	5.42	0.23		
58	713	Internal combustion piston engines	57,549,598	83,209,569	5.41	1.17		
59	516	Other organic chemicals	11,167,917	16,141,694	5.40	0.23		
60	897	Jewellery, goldsmiths and other art.	19,875,162	28,553,337	5.31	0.40		
61	513	Carboxylic acids,& their anhydrides	15,298,938	21,956,679	5.30	0.31		
62	699	Manufactures of base metal, n.e.s.	42,053,953	60,191,621	5.26	0.84		
63	424	Other fixed vegetable oils, fluid or	7,847,580	11,216,586	5.24	0.16		
64	775	Household type, elect.& non-electric	36,171,603	51,627,445	5.21	0.72		
65	793	Ships, boats and floating structures	37,078,182	52,652,788	5.14	0.74		
66	873	Meters and counters, n.e.s.	2,566,499	3,638,725	5.11	0.05		
67	048	Cereal prepar. & preps. of flour of	16,636,346	23,566,401	5.10	0.33		
68	716	Rotating electric plant and parts	26,206,687	37,083,047	5.08	0.52		
69	667	Pearls, precious & semi-prec. stones, u	40,169,963	56,651,921	5.03	0.79		
70	431	Animal & vegetable oils and fats, pr	3,615,979	5,099,616	5.03	0.07		
71	782	Motor vehicles for transport of goo	48,664,888	68,171,179	4.93	0.96		
72	656	Tulle, lace, embroidery, ribbons, & oth	4,273,337	5,972,257	4.90	0.08		
73	**843**	**Outer garments, women's, of textile f**	**40,524,079**	**56,453,269**	**4.85**	**0.79**	**34.10**	**0.0584**
74	511	Hydrocarbons nes, & their halogen.&	20,013,655	27,819,598	4.82	0.39		
75	635	Wood manufactures, n.e.s.	14,868,576	20,650,956	4.80	0.29		

Table 4.2: Mongolia's Position Against the World's 78 Most Dynamic Export Items, 1996-2003 (cont.)

Nr	Pro duct	Product Name	World Trade				Mongolia's 2003 exports	
			Value ($ '000)	Value ($ '000)	% p.a. growth	% share of total	% p.a. growth	World MS (%)
			1996	2003	1996-03	2003	1996-03	2003
76	222	Oil seeds and oleaginous fruit, whol	14,435,242	20,041,993	4.80	0.28		
77	584	Regenerated cellulose, cellulose nit	2,455,989	3,406,983	4.79	0.05		
78	752	Automatic data process-ing machines	150,850,866	208,881,072	4.76	2.93		
83	**333**	**Petrol. Oils, crude,& c.o. obtain. From**	**192,714,914**	**264,096,293**	**4.60**	**3.70**	**...**	**0.0017**
89	**723**	**Civil engineering & contractors pla**	**32,993,956**	**44,833,225**	**4.48**	**0.63**	**26.20**	**0.0041**
95	**941**	**Animals, live, n.e.s., incl. zoo-anima**	**355,707**	**479,766**	**4.37**	**0.01**	**122.88**	**0.3892**
101	**672**	**Ingots and other pri-mary forms, of i**	**25,846,896**	**34,166,524**	**4.07**	**0.48**	**1.21**	**0.0090**
129	**842**	**Outer garments, men's, of textile fab**	**30,719,446**	**37,433,642**	**2.86**	**0.52**	**8.03**	**0.0405**
154	**611**	**Leather**	**15,961,306**	**18,404,778**	**2.06**	**0.26**	**...**	**0.2573**
164	**971**	**Gold, non-monetary**	**26,761,267**	**30,135,462**	**1.71**	**0.42**	**...**	**0.4642**
166	**844**	**Under garments of textile fabrics**	**10,664,420**	**11,930,124**	**1.62**	**0.17**	**23.19**	**0.1149**
169	**011**	**Meat, edible meat of-fals, fresh, chi**	**40,089,963**	**44,713,438**	**1.57**	**0.63**	**12.37**	**0.0301**
175	**278**	**Other crude minerals**	**7,221,630**	**7,942,306**	**1.37**	**0.11**	**-0.99**	**0.2721**
178	**287**	**Ores and concentrates of base metal**	**18,320,712**	**19,922,787**	**1.20**	**0.28**	**-2.87**	**0.8987**
179	**322**	**Coal, lignite and peat**	**20,615,297**	**22,412,977**	**1.20**	**0.31**	**137.28**	**0.0261**
186	**291**	**Crude animal materi-als, n.e.s.**	**3,740,846**	**3,942,958**	**0.75**	**0.06**	**-1.51**	**0.1423**
193	**682**	**Copper**	**31,563,980**	**32,103,105**	**0.24**	**0.45**	**198.73**	**0.0074**
204	**211**	**Hides and skins (ex-cept furskins),**	**5,638,385**	**5,444,930**	**-0.50**	**0.08**	**-14.90**	**0.1312**
233	**268**	**Wool and other animal hair (exclu.**	**4,912,154**	**3,243,079**	**-5.76**	**0.05**	**-7.02**	**1.4558**
234	046	Meal and flour of wheat and flour o	3,184,609	1,996,036	-6.46	0.03		
235	951	Armoured fighting ve-hicles, arms of	7,281,049	4,485,689	-6.69	0.06		
236	261	Silk	483,225	286,127	-7.21	0.00		

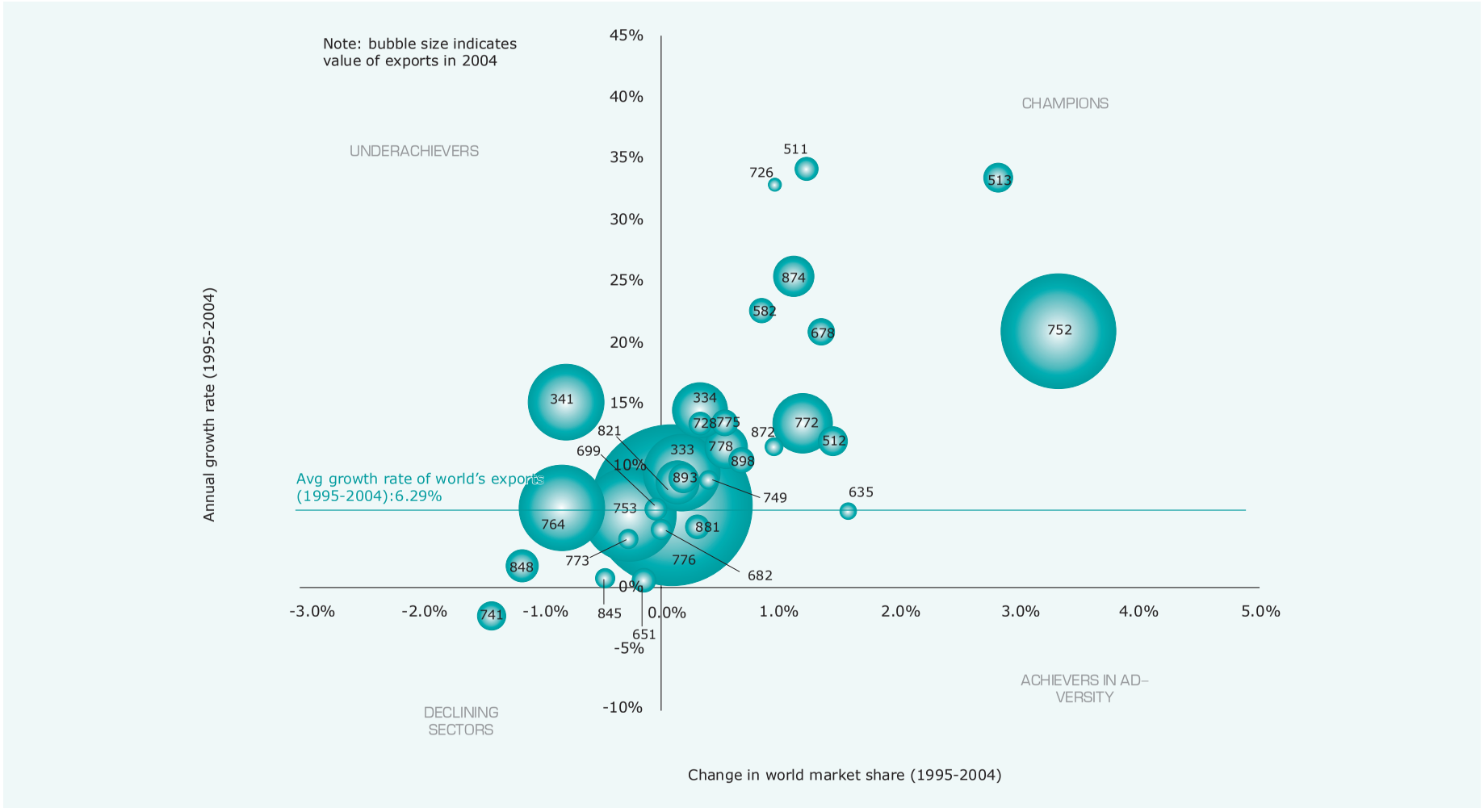
Source: UN Comtrade

Figure 4.1: Mongolia's Market Positioning for Manufactured Exports (1996-2003)



11 Meat, edible meat offals, fresh, chilled
334 Petroleum products, refined
941 Animals, live, n.e.s.
211 Hides & skins
611 Leather
971 Gold, non monetary
268 Wool and other animal hair
672 Ingots and other primary forms
278 Other crude minerals
723 Civil engineering & contractors plant
287 Ores and concentrates of base metal
842 Outer garments, men's, of textile fa
291 Crude animal materials, n.e.s.
843 Outer garments, women's, of textile
322 Coal, lignite and peat
844 Under garments of textile fabrics
333 Petrol oils, crude
845 Outer garments, knitted
682 Copper
846 Under garments, knitted or crocheted

Figure 4.2: Malaysia's Market Positioning for Manufactured Exports (1995-2004)



PRIMARY PRODUCTS (PP)
333 Petroleum oils, crude
341 Gas, natural and manufactured
682 Copper

RB MANUFACTURES
334 Petroleum prod., refined
635 Wood manufactures, n.e.s.
511 Hydrocarbons, n.e.s.

651 Textile yarn
845 Outer garments, knitted
893 Articles of materials desc. In div, 58

LT MANUFACTURES
582 Condensation products
699 Manufacture of base metal
678 Tubes, pipes and fittings
772 Electric apparatus

821 Furniture
848 Articles of apparel, non-textile
898 Musical instruments

MHT MANUFACTURES
512 Alcohols, phenols
513 Carboxylic acids
726 Printing & bookbinding machines
741 Heating/cooling equipt
749 Non-electric parts

773 Equipt for electricity
775 Household type equipt
728 Machinery/equipt specialized
778 Electrical machinery
872 Medical instruments
752 Data processing machines
764 Telecoms equipt
776 Thermionic valves, tubes
874 Measuring instruments
881 Photographic apparatus

5 THE COMPETITIVENESS OF THE WOOL & CASHMERE SECTOR

Mongolia is the world's second biggest raw cashmere producer after China. It is estimated that around 70% of the raw cashmere is processed locally. The cashmere industry is Mongolia's one of the leading export sectors and constitutes around 30% (trade value) of the country's exports. Around 2% of the exported cashmere is raw cashmere, 50% is scoured cashmere, and 40% in woven cashmere articles. The Government is implementing a Cashmere Program, in its aim to enhance the competitiveness of Mongolian cashmere in the world market.

The wool processing industry processes more than 10 types of wool (e.g., sheep, camel, goat, yak, horse, and cow). Approximately 70% of the wool originates from sheep, and 80% of the national products made with sheep wool are carpets. The wool processing industry is producing some 2.5% of the GDP. The development policy of the Wool Program is seeking to ensure the sustainable growth of the industry by introducing modern technology and advanced techniques for improving the wool product quality to meet the international market requirement and enhance competitiveness.

Almost all Mongolian cashmere is exported, and wool & cashmere exports of $47.2 million accounted for over 7.7% of official exports in 2003. According to a World Bank's recent study on Mongolian cashmere industry (WB, 2002), these figures considerably understate the importance of the industry to the Mongolian economy, as over 38% of the raw cashmere produced was smuggled to China. The Mongolian cashmere industry has experienced a series of booms and busts over the last decade. Cashmere's world market share fell from 5.1% in 1996 to 2.7% in 2001, and increased to 10.8% in 2003. The industry suffers from five principal shortcomings: supply distortions, decreasing cashmere quality, demand imperfections, inadequate marketing and distribution systems, and poor public and private institutional capacity to guide industrial policy development. The lack of an efficient public sector to provide public goods, inadequate strategic business development policies, and unregulated and outdated production patterns have stifled competition and prevented the industry from reaching its potential. Mongolia's cashmere industry has moved marginally up the

value-added chain beyond primary production, leaving it especially vulnerable to changes in market demand.

Competitive position on global market

Global market trends

World exports of *wool and other animal hair* (SITC 268) totaled $3.61 billion in 2004 ($5.06 billion in 1995). Australia, New Zealand and Argentina were major exporters in SITC 2681 *(Sheep's or lamb's wool, greasy)* and SITC 2682 *(Sheep's or lamb's wool, degreased)*, while China and Mongolia led in SITC 2683 *(Fine animal hair, not carded or combed)* and SITC 2687 *(Sheep's/lamb's wool/other animal hair)*. Finally, SITC 2685 *(Horsehair & other coarse animal hair)* and 2686 *(Waste of sheep's/lamb's wool)* are minor export categories involving small amounts of trade value. Figures 5.1 to 5.6 show the SITC 268 export breakdown for the world and for each main exporting country.

For the world as a whole, not a single 4-digit export category can escape the general downward trend of exports (see figure 5.1). The decline is most severe in SITC 2683 (-10.62% p.a.), SITC 2682 (-6.00% p.a.) and SITC 2685 (-5.08% p.a.); it is less acute in SITC 2681 (-2.46% p.a.), SITC 2686 (-1.98% p.a.), and SITC 2687 (-0.72% p.a.). More particularly, there are significant shrinkages in both SITC 2681 and 2682 for Australia (see figure 5.2), New Zealand (see figure 5.3) and Argentina (see figure 5.4). In the case of China (see figure 5.5), there is a dramatic shrinkage in SITC 2683 (-40.38% p.a.) and a significant rise in SITC 2687 (5.63% p.a.). As for Mongolia (see figure 6.6), both SITC 2683 and 2687 exports have shrunk.

Figure 5.1:World's SITC 268 Export Breakdown, 1995 and 2004

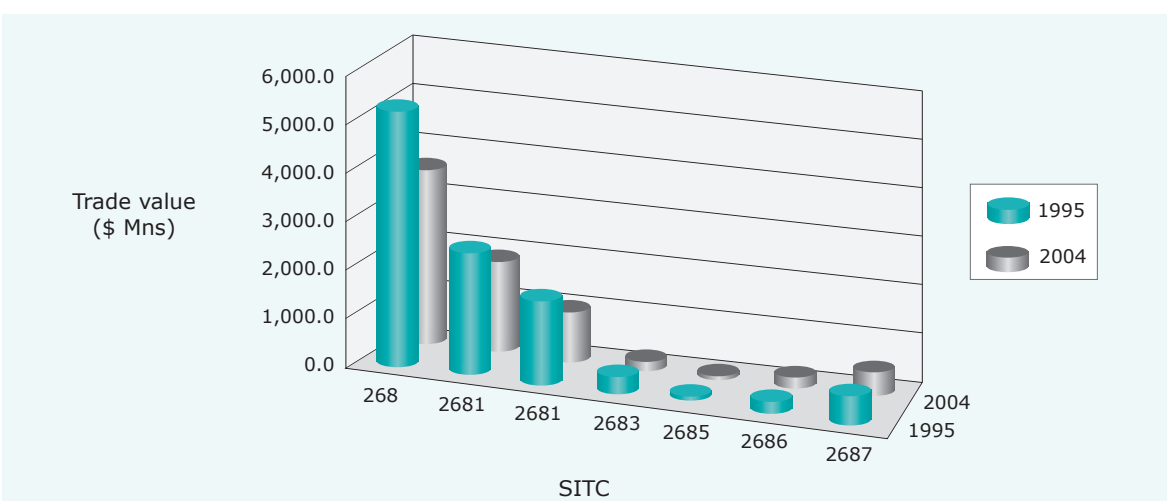


Figure 5.2: Australia's SITC 268 Export Breakdown, 1995 and 2004

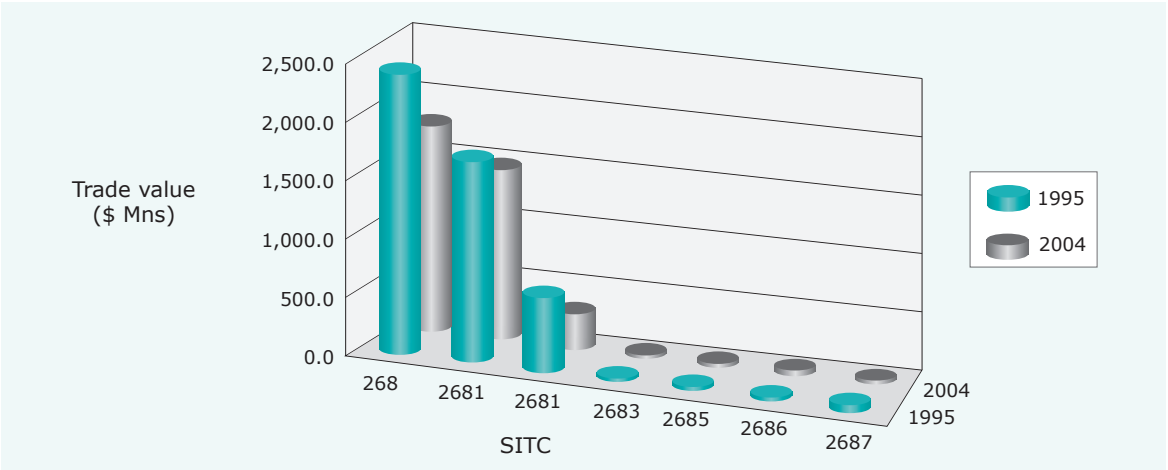


Figure 5.3: New Zealand's SITC 268 Export Breakdown, 1995 and 2004

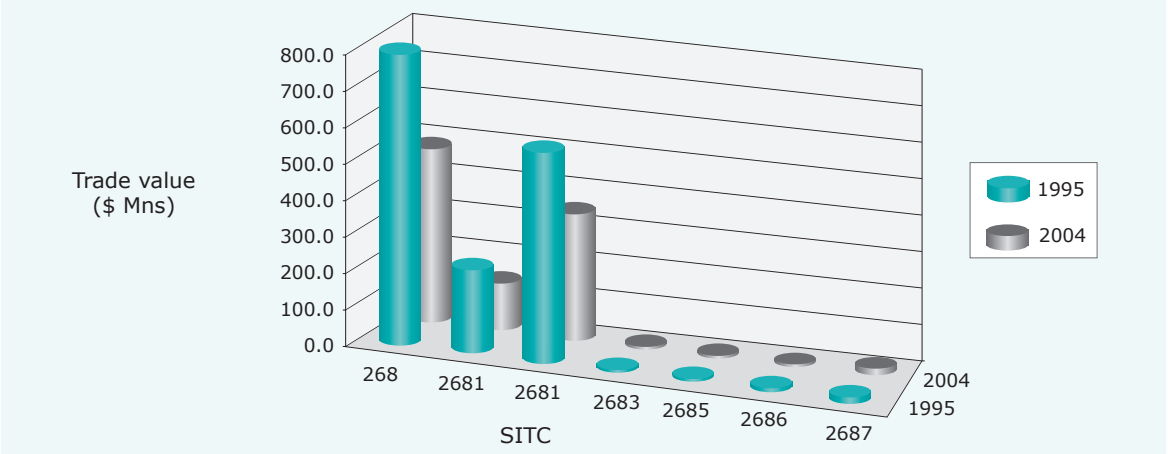


Figure 5.4: Argentina's SITC 268 Export Breakdown, 1995 and 2004

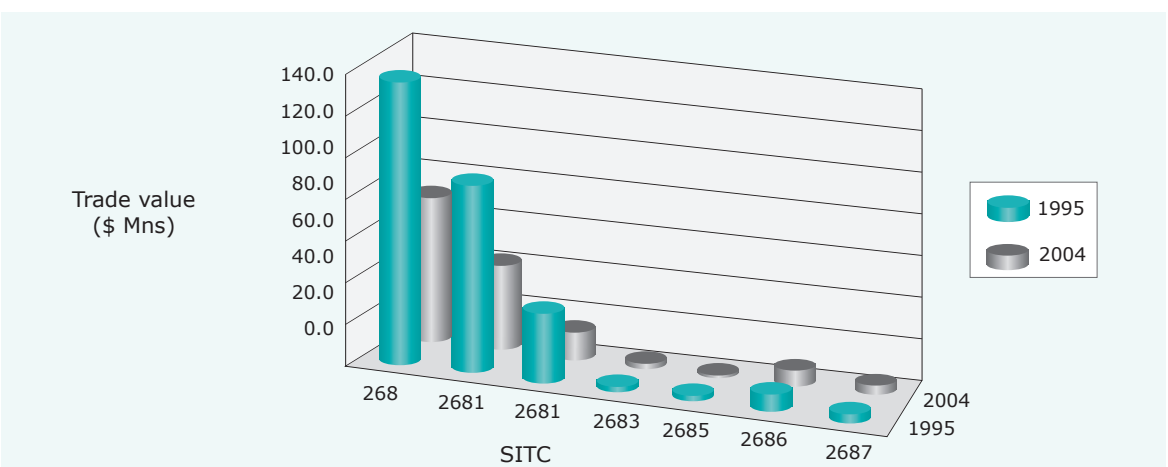


Figure 5.5: China's SITC 268 Export Breakdown, 1995 and 2004

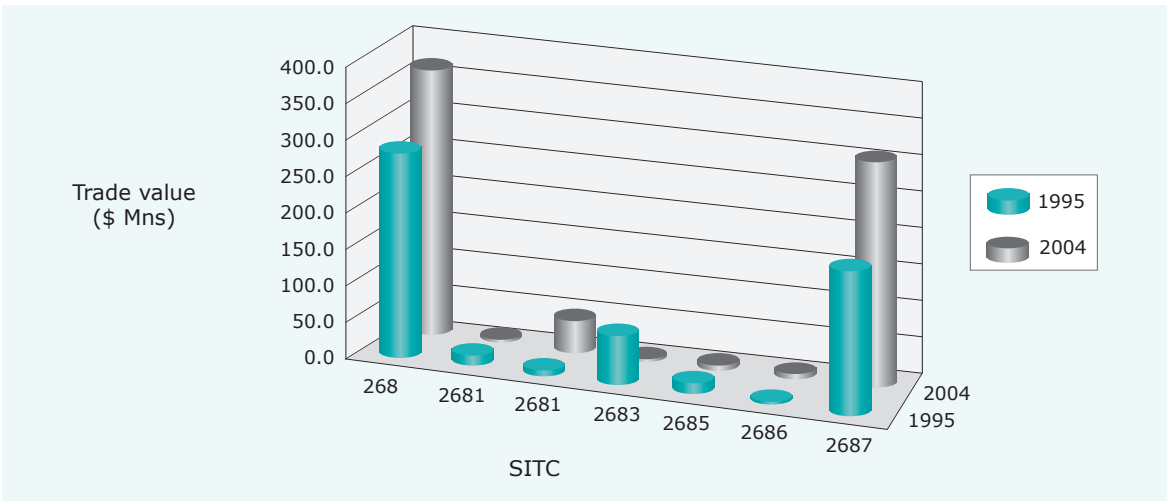


Figure 5.6: Mongolia's SITC 268 Export Breakdown, 1996 and 2003

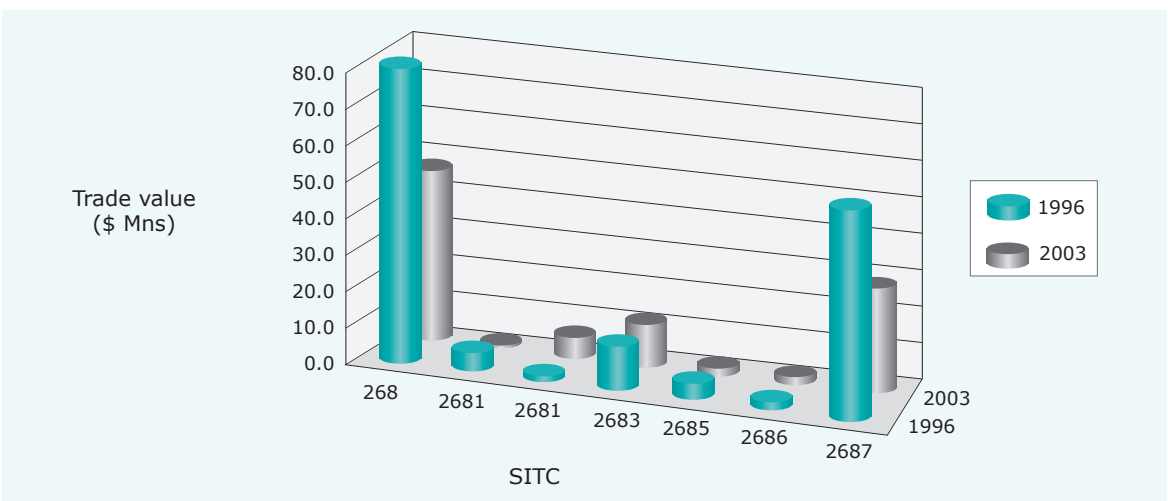


Figure 5.7: Trends in Wool and Other Animal Hair (SITC 268) Exports in the World, 1995-2004

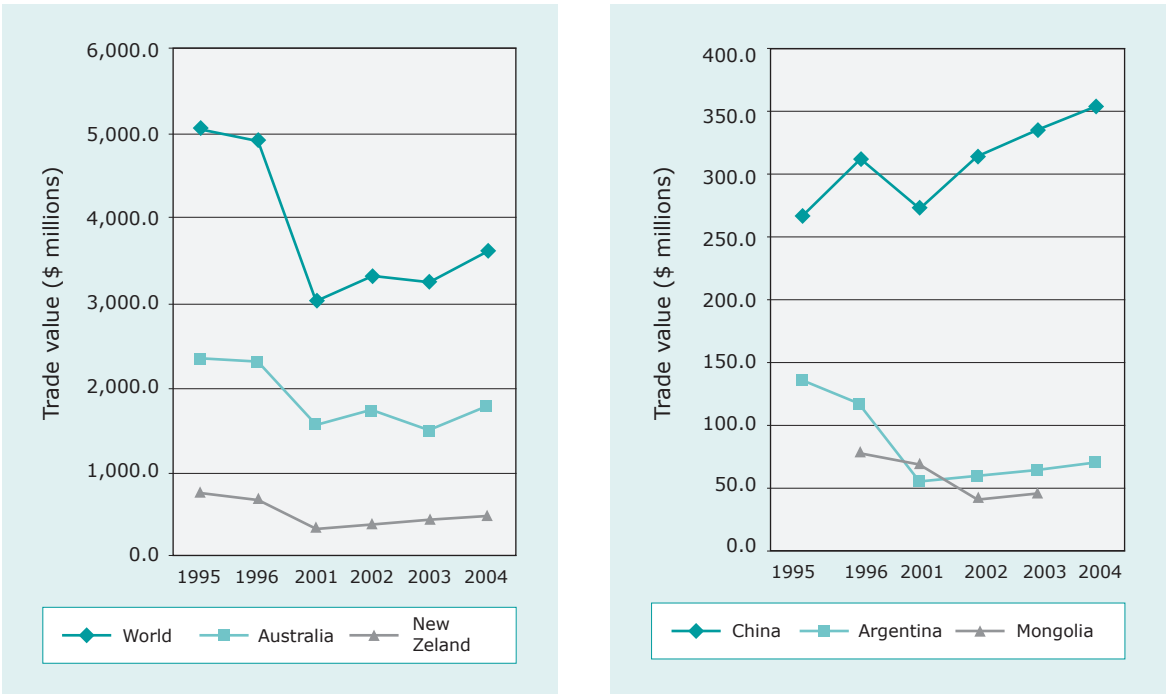


Figure 5.8: Trends in Sheep's or Lamb's Wool (SITC 2681/2682) Exports in the world, 1995-2004

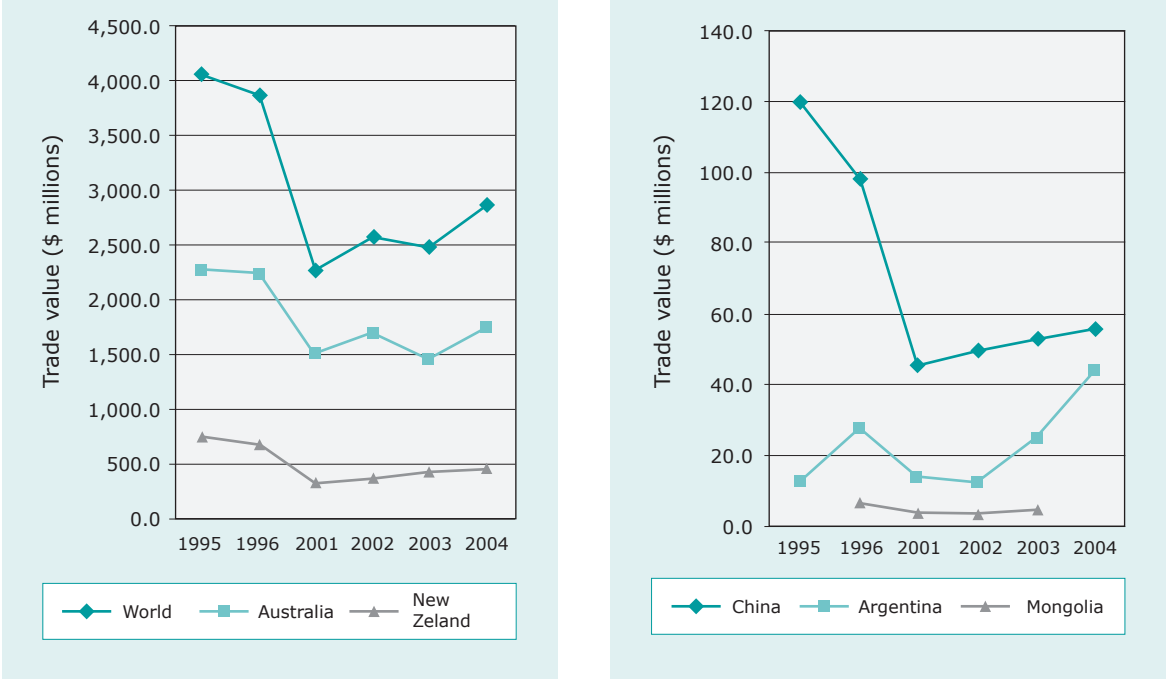


Figure 5.9: Trends in Fine Animal Hair, Not Carded or Combed (SITC 2683) Exports, 1995-2004

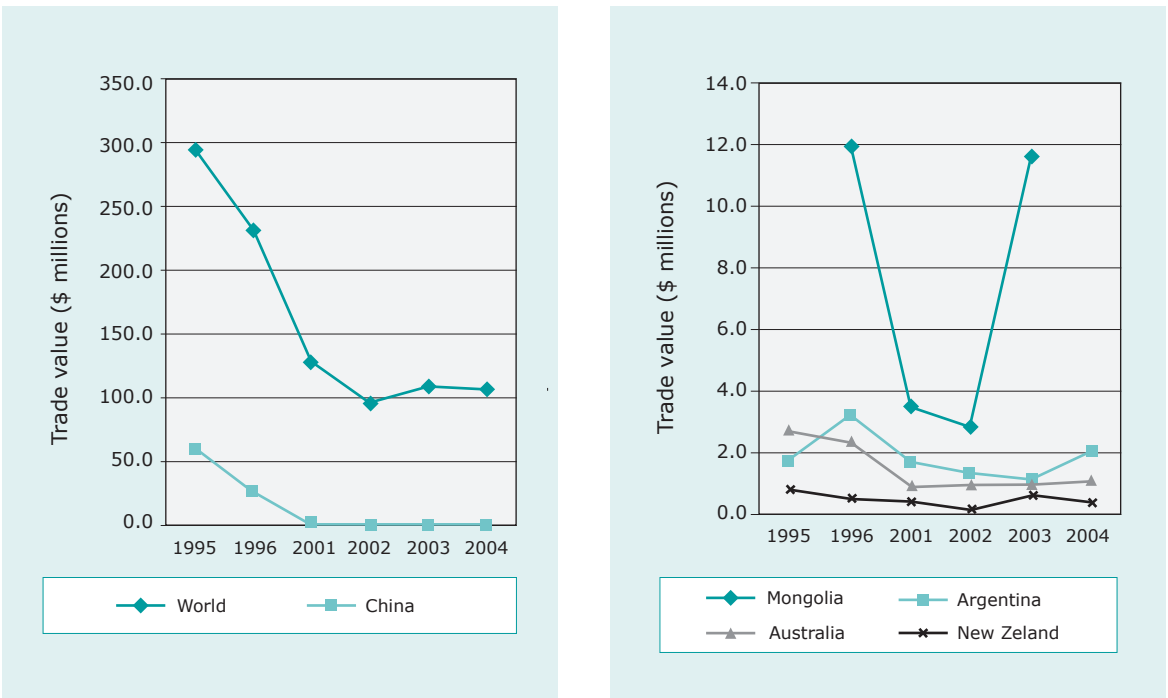
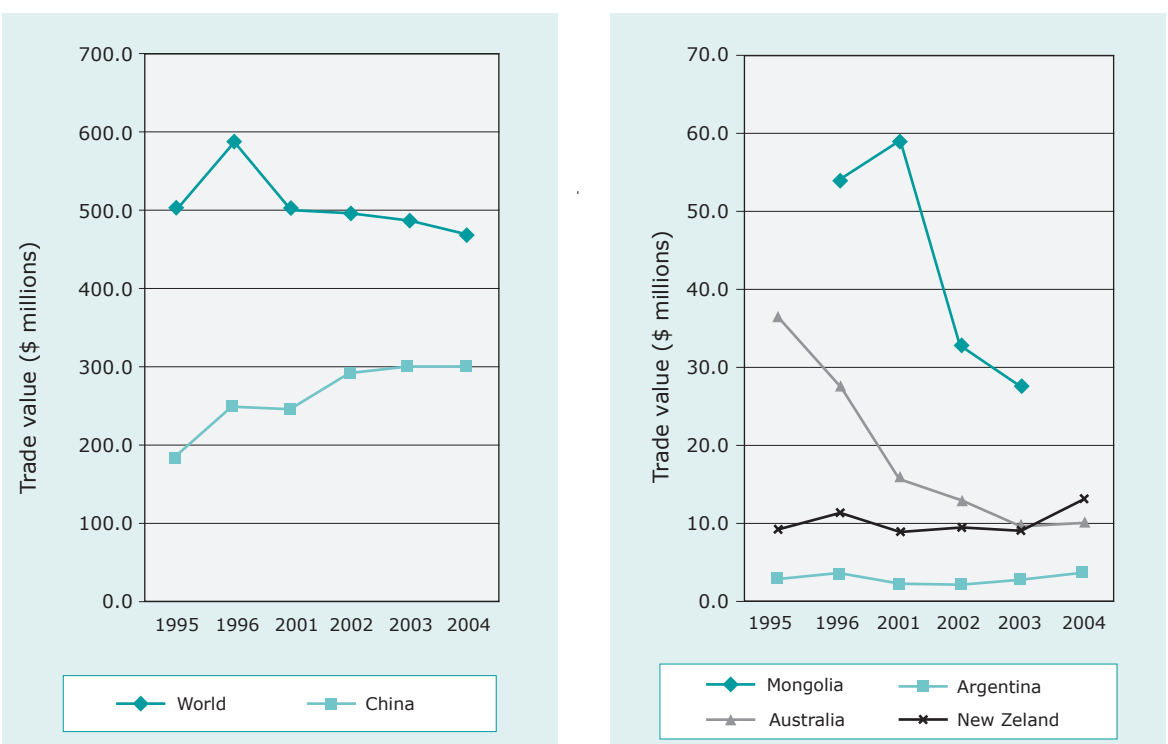


Figure 5.10: Trends in Sheep's/lamb's wool/other animal hair (SITC 2687) exports, 1995-2004



Competitive positioning

At the aggregate level (SITC 268), China and Australia are the two exporters that exhibited strong competitiveness (rising world market share) in dynamic products growing faster than total trade; the three other benchmark countries (Argentina, New Zealand and Mongolia) showed a weak aggregate export structure.

At the disaggregate level, China had a dominant position in SITC 2682 and 2687, while Australia was competitive only in SITC 2681. New Zealand emerged as an important competitor in SITC 2682, and Mongolia and Argentina in SITC 2683.

Figure 5.11: Competitive Positioning of Selected Countries in the Global Market, the Wool & Other Animal Hair (SITC 268) Sector, 1995-2004

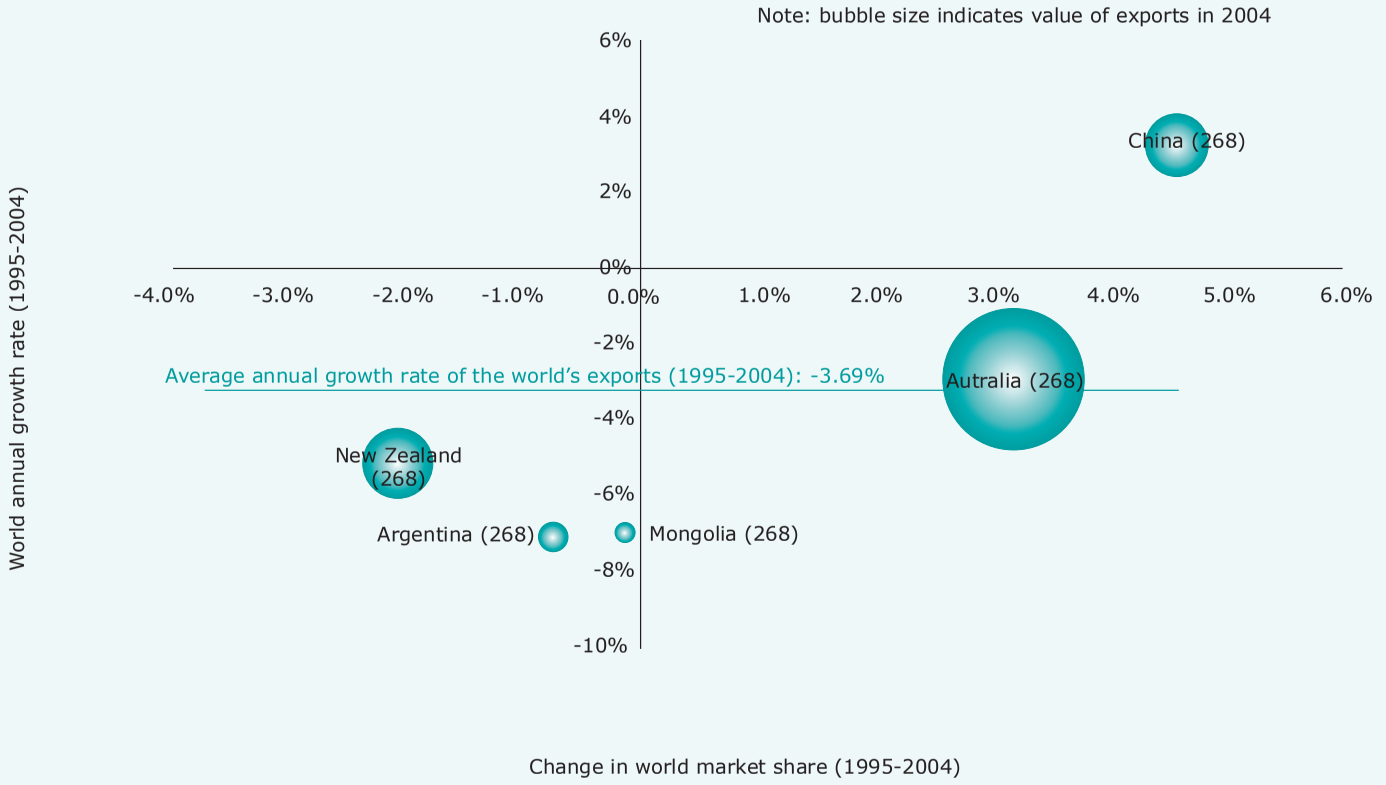


Figure 5.12: Competitive Positioning of Selected Countries in the Global Market, the Sheep's or Lamb's Wool, Greasy (SITC 2681) Sub-sector, 1995-2004

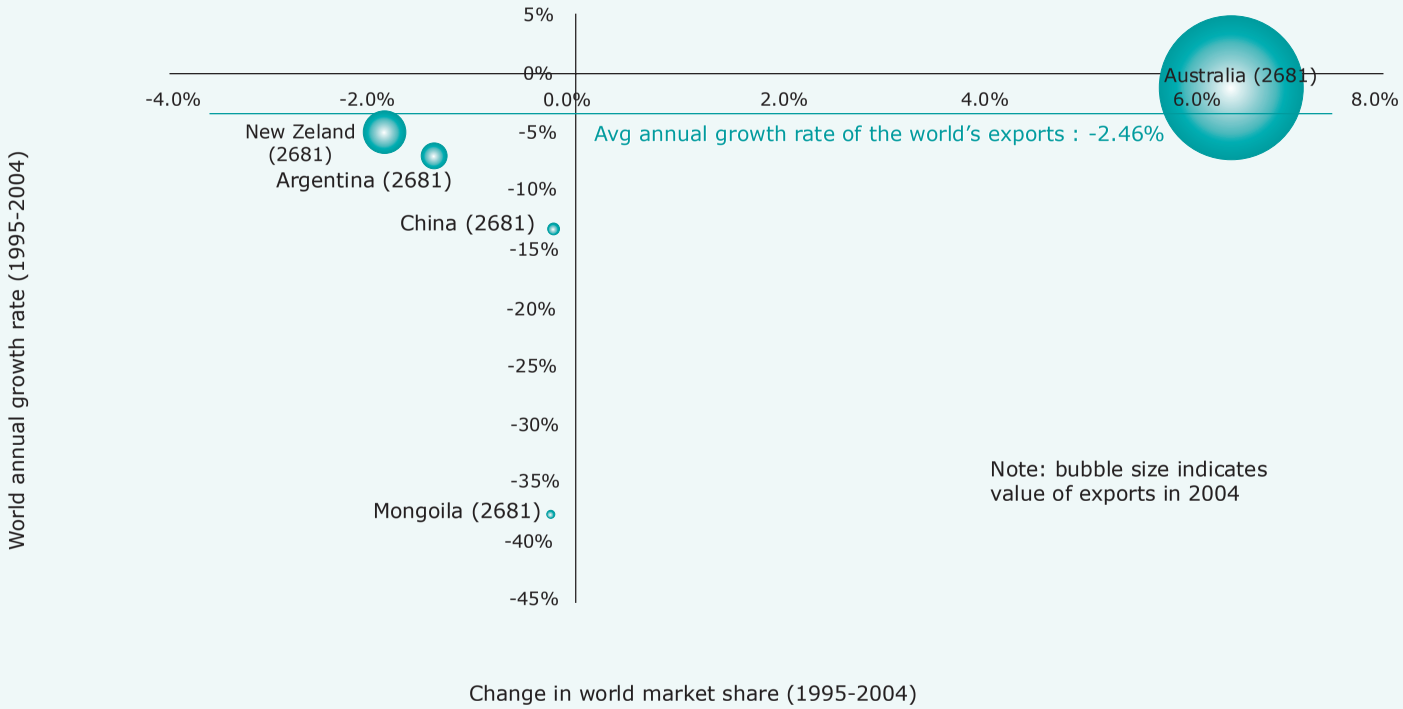


Figure 5.13: Competitive Positioning of Selected Countries in the Global Market, the Sheep's or Lamb's Wool, Degreased (SITC 2682) Sub-sector, 1995-2004

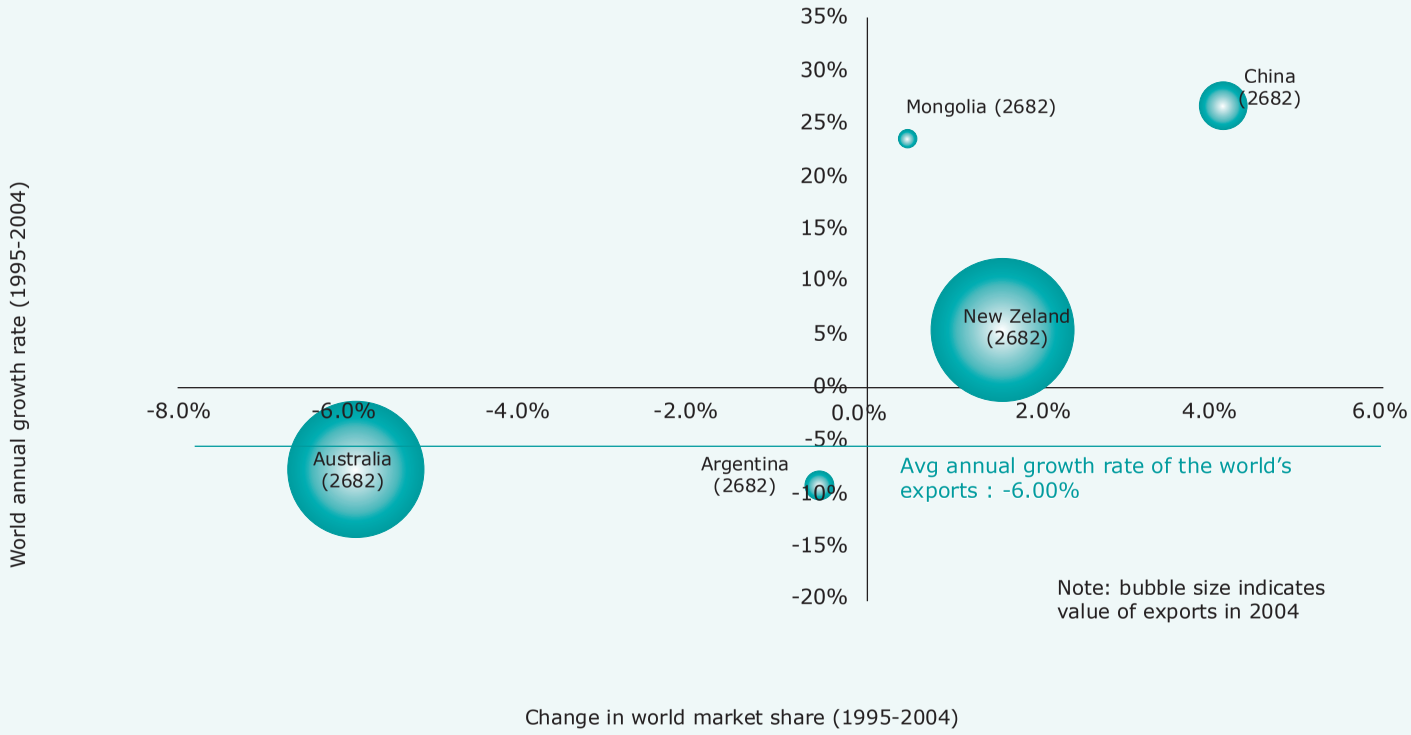
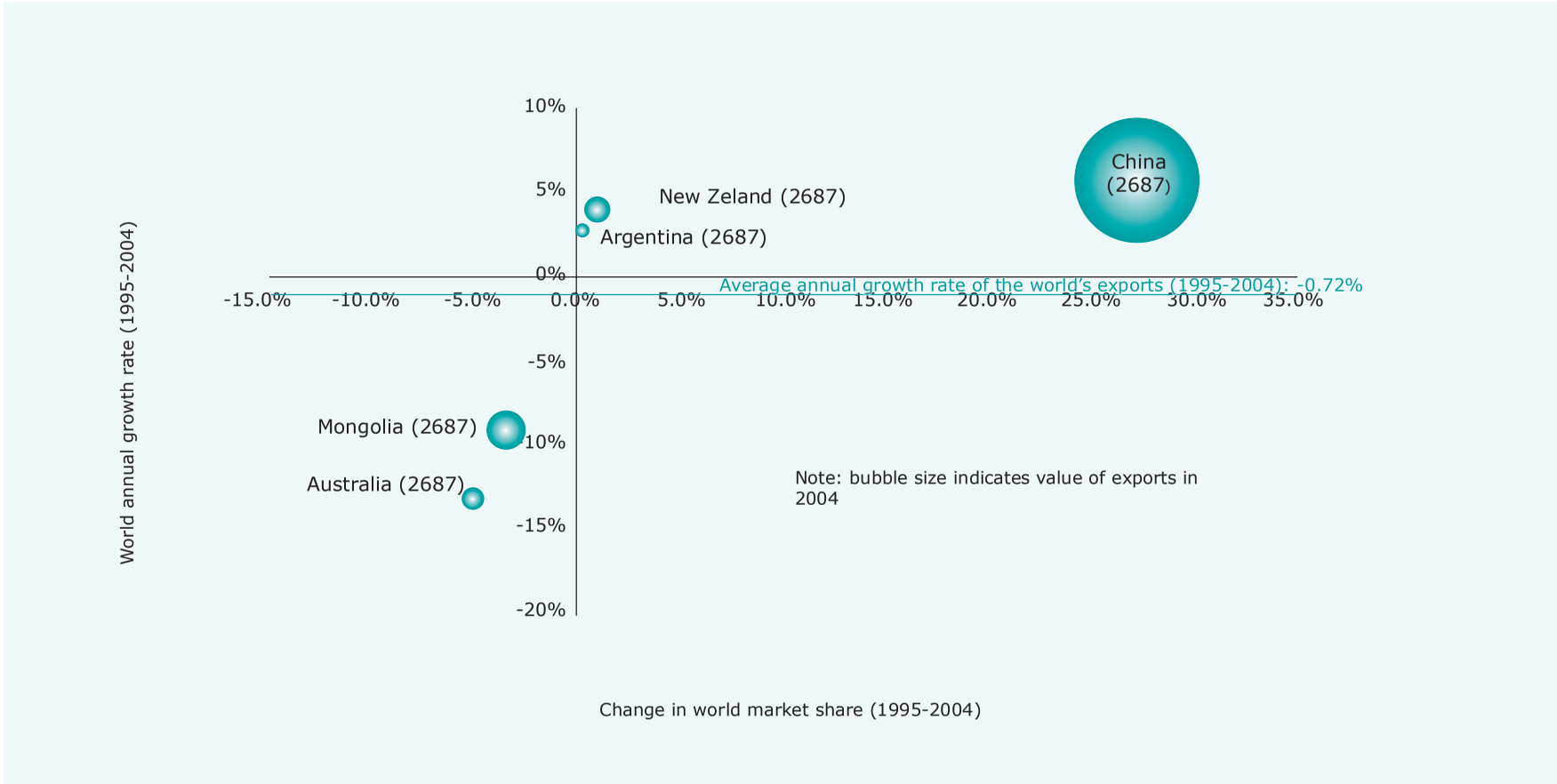


Figure 5.14: Competitive Positioning of Selected Countries in the Global Market, the Fine Animal Hair, Not Carded or Combed (SITC 2683) Sub-sector, 1995-2004

Figure 5.15: Competitive Positioning of Selected Countries in the Global Market, the Sheep's/Lamb's/Other Animal Hair (SITC 2687) Sub-sector, 1995-2004



Concluding remarks

As expected, Mongolia is dependent on world market for exports of processed cashmere and cashmere products; this fact cannot be avoided. Cashmere is a national asset only because of its value in foreign markets. This means that many economic events or changes that impact the Mongolian cashmere industry are outside Mongolian direct control, including those in the main large competitor, China. Ultimately, policy actions in other countries that impact Mongolia adversely through trade will have to be handled in the WTO, which was created for exactly this kind of problem. The linkage of Mongolia to world markets also means that changes in Mongolian cashmere policies work through these world markets, sometimes in ways that offsets the policy's intent. Therefore, careful analysis is useful when policy changes are debated.

Given the current status of the world market for cashmere products, Mongolia has a great potential to capture the higher quality ends of the global market with efficient production and good marketing. The world cashmere market has experienced quite wide swings in prices in the past. However, being a relatively small supplier to the world market, Mongolia should be able to respond faster than other suppliers to catch the market upturns when they occur.

Ultimately, Mongolia will determine the future of its cashmere industry. Its policy choices, agricultural and animal husbandry practices, marketing and management skills, and knowledge of the world market with its ups and downs, will definitely determine the fate of the Mongolian cashmere industry.

6 THE COMPETITIVENESS OF THE LEATHER SECTOR

As stated in a recent study (UNIDO/UNDP, 2002), there exists a large demand for leather in Mongolia and internationally, particularly for sheep/goatskin leather garment industry. Yet, most hides and skins are exported to China either raw or as semi-processed wet blue. Before 1990, state-owned sheepskin tannery and garment manufacturer *Darkhan Nekhii* exported 90% of its double-face coats to Siberia, where its products were highly appreciated for their warmth. This plant closed down its operations in early 1998, due to accumulation of large debts, sporadic production, frequent management changes, a 40-50% import tax imposed by Russia, and lack of in-house marketing skills to explore new markets. Now, imports from as far as Korea and Turkey – which enjoy virtually duty-free access to the Mongolian market – supply part of the domestic demand for the manufacturing of leather jackets, boots and other leather products.

The poor quality of hides and skins, and procurement difficulties are often cited as major constraints for the domestic leather industry. Yet, they find a ready market in China despite their present quality, and a marketing chain stretching from the Mongolian hinterland to Chinese cities across the border regularly supplies Chinese manufacturers. The large, partly state-owned *Buligaar* tannery does indeed face difficulty in procuring raw materials, but this is due to its inability to raise working capital, or prohibitive interest rates. The factory was closed down for almost four years before recommencing operation in 2001, and it is now operating at around 10% capacity.

The state-organized hide collection system collapsed in 1990. Now, tanneries procure from traders or enter into contracting deals with slaughterhouses. Middlemen usually undertake barter trade with herders at the *soum* level. They also procure on behalf of foreign traders. The main export market remains China; however, small amount of semi-processed products are exported to Korea or Russia. Hides are commonly smuggled to China and Russia, due to a high import tax for skins & hides.

The quality of skins has deteriorated markedly in the past 15 years, since dipping baths and drugs used for treatment of state-owned herds in the past were abandoned. On a 1-5 scale used internationally, Mongolian leather ranked 4, because skins are covered with scars and perforations produced by parasitic worms. These cannot be detected at the time of purchase, and only appear when the leather is processed. The holes make the skins unsuitable for the production of higher value jackets and garments, and are mainly used for small items such as bags, boots and wallets.

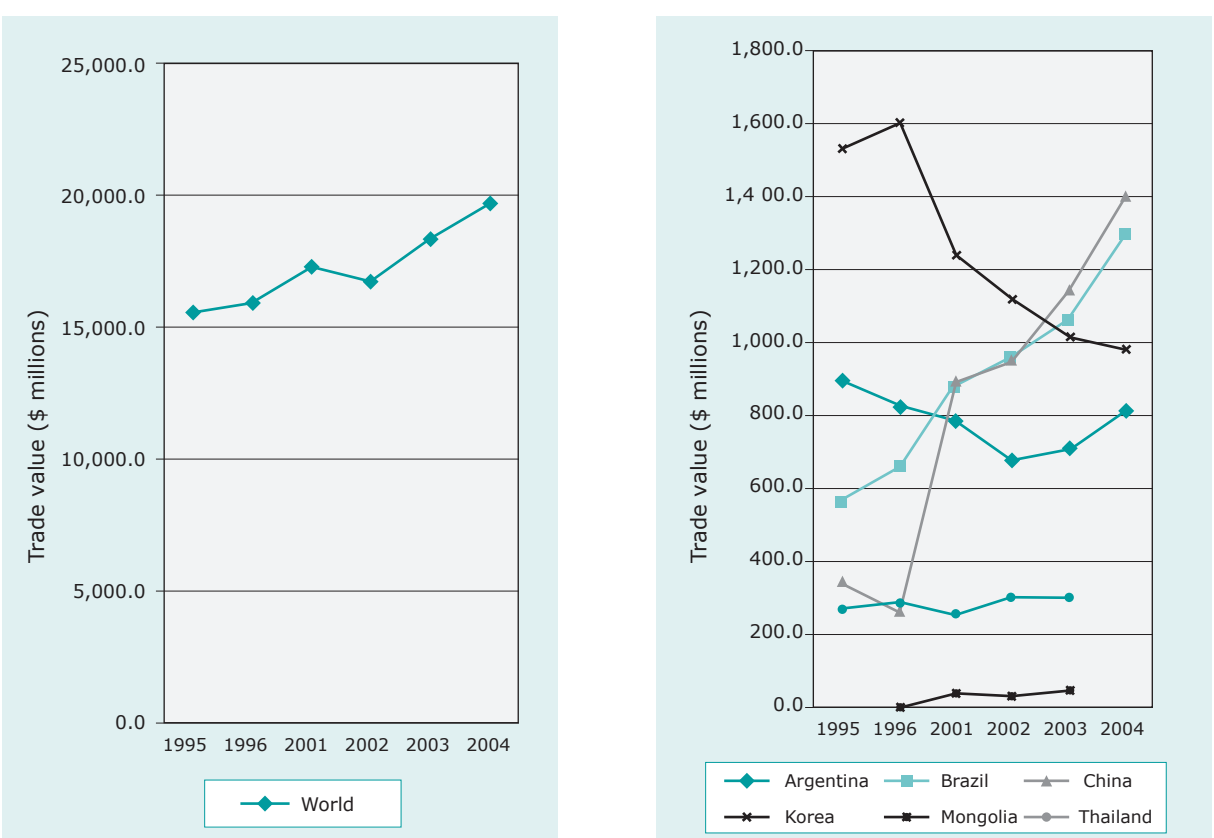
Selected Mongolian sheepskin and goatskin, when not damaged by wormholes made by parasites, do meet international standards for leather clothing. The world demand for this type of processed skin is estimated at 60-70 million pieces/year, and Mongolia could cover a tenth of this demand. Countries supplying hides and skins to the world market included Australia, China, EU countries, India, New Zealand, Russia, the Republic of Korea, and the USA.

Competitive position on global market

Global market trends

World exports of leather products (SITC 611) amounted to $19.7 billion in 2004, up from $15.6 billion in 1995, growing at an average rate of 2.68% p.a.. The largest contributors to this overall growth rate were China and Brazil, whose exports have witnessed an extraordinary development (at respectively 16.73% and 9.71% p.a.) between 1995 and 2004. The growth rate of Mongolia's exports was also high (at 8.18% p.a.) between 1996 and 2003; that of Thailand's was much more sluggish (1.42% p.a. between 1995 and 2003), below the overall rate of world exports. Argentina's exports have not yet recovered since the 2002 trough (negative 1.06% p.a.), while Korea's exports continued to register a downward trend (at a negative rate of 4.76% p.a.) since 1995. Figure 6.1 shows the export trends in leather exports in the world between 1995 and 2004.

Figure 6.1: Trends in Leather (SITC 611) Exports in the World, 1995-2004

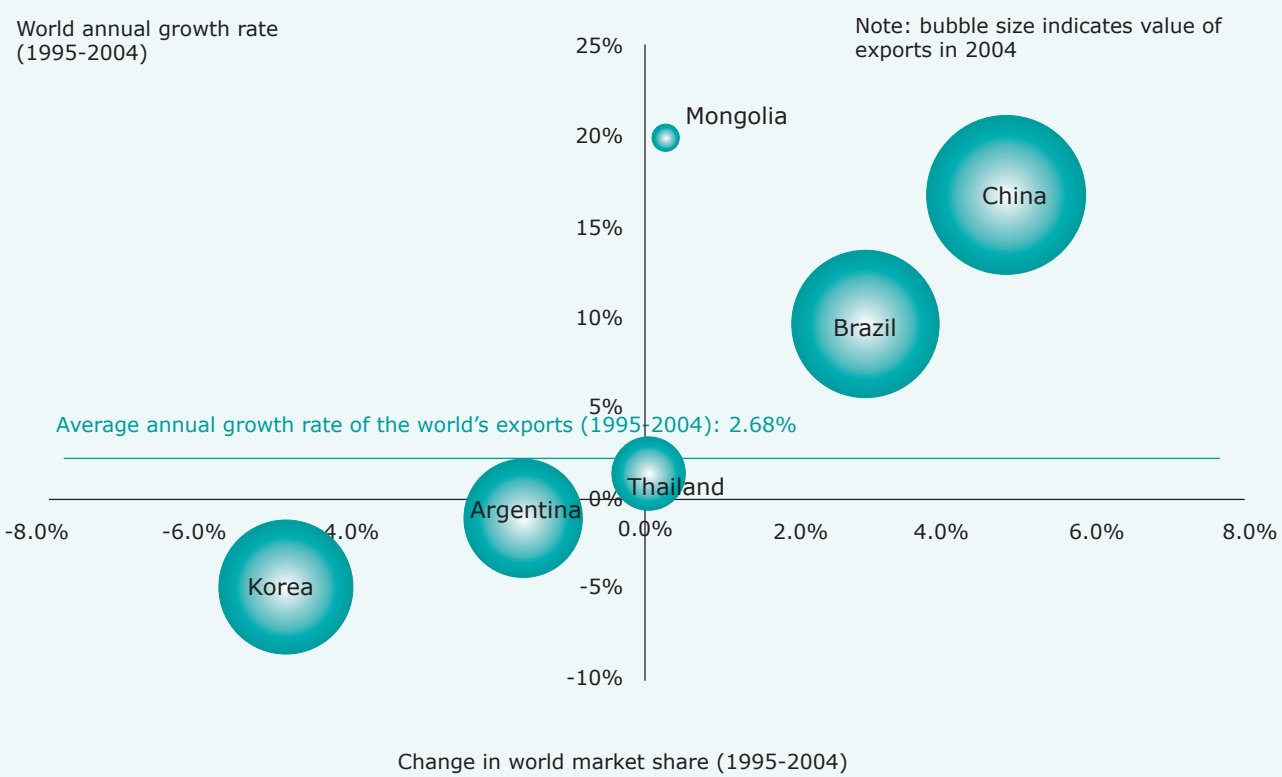


Competitive positioning

As shown in figure 6.2, China and Brazil have substantially improved their market share, from respectively 2.23% and 3.60% in 1995 to respectively 7.09% and 6.54% in 2004. Mongolia, to a certain extent, has also consolidated its market share (from 0.23% in 1996 to 0.26% in 2003). By contrast, Argentina and Korea have registered a significant drop in their market share (respectively 1.64 and 4.83 percentage points) between 1995 and 2004.

In terms of market positioning, China, Brazil and, to a lesser extent, Mongolia are considered as world's «champions» for leather exports, while Argentina and Korea of their market share, from , are among the «champions», Thailand and Mongolia are more at the limit between the «champions» and the «underachievers», while Korea and Argentina are in the «declining sectors» business area. Thailand is itself a grey area, falling between the «declining sectors» and the «achievers in adversity».

Figure 6.2: Competitive Positioning of Selected Countries in the Global Market, the Leather Sector (SITC 611), 1995-2004



Concluding remarks

The National Program for the leather industry was developed with the objective to ensure the sustainable development of the livestock product processing industry. This industry is crucial for the economic development of the country in the achievement of the Government's objectives to promote export-oriented industry, to achieve about 10% growth, and to maintain the sustainable development of the industry.

Mongolia has vast resources of hides & skins and a large excess capacity in production facilities. A long-term vision jointly formulated by the public and private sector should be prepared to take advantage of these resources and turn the leather industry into a major foreign exchange earner and provider of employment.

7 THE COMPETITIVENESS OF THE MEAT SECTOR

Meat is currently Mongolia's only food export product and the only one with further potential for development as an export. All other food products are limited to supplying the domestic market.

Mongolian beef is very competitive at $0.6-0.8 per kg, or only half the price in China and a third of the price in Russia. It can also be conveniently shipped by rail to Siberia and Beijing. The Mongolian Meat Exporters Association has managed to restart meat exports to Russia following a government-to-government agreement to repay debt in kind, on condition that Russian veterinarians inspect all meat exported to that country.

Meat export was a large business before 1990. According to a recent study (UNIDO/UNDP, 2002), some 22,000 tonnes of raw meat were exported mainly to Siberia (one million small animals and 0.2 million large animals), especially from the large, state-owned *Makh Impex* plant in Ulaanbaatar, but also from four or five other regional abattoirs. Following the transition, Russian demand declined drastically due to the lower purchasing power of its population, and the imposition of high import tariffs (20% on raw meat and 40% on meat products such as sausages and salami). Moreover, due to their monopsony power, Russian buyers dictated the price and terms of payment. Since the outbreak of foot and mouth disease in 2002, the Russian and other markets have been virtually closed. The outbreak has also provided China with an excuse to ban Mongolian meat from its promising Chinese market, though diseases such as foot and mouth can also be transmitted in hair, hides & skins, which are freely exported to China. Japan and the Republic of Korea also imported small amounts of meat as canned pet food, while Japan imported limited amount of horsemeat (UNIDO/UNDP, 2002).

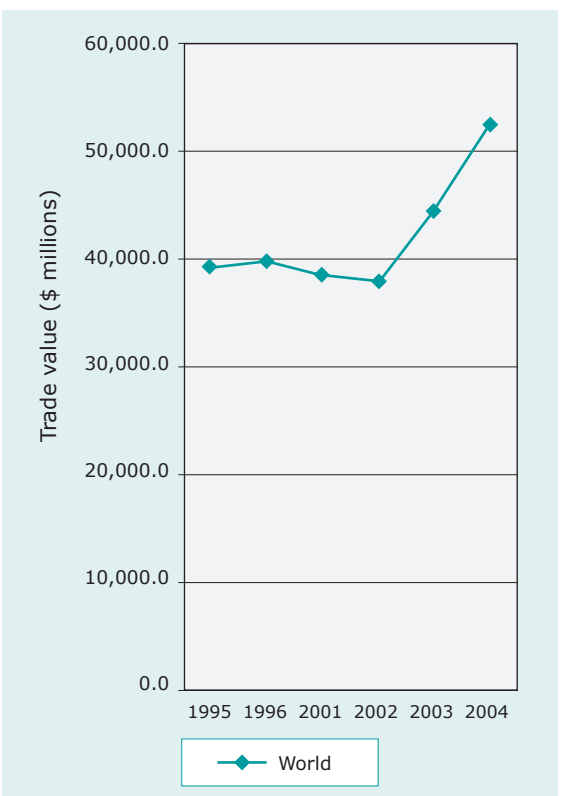
The Mongolian meat sector has suffered over the last 40 years from a dependence on Russia as its virtually sole export market. As a result, Mongolian meat products have not achieved the diversification required to compete in dynamic international markets. Tighter quotas and strict import bans due to livestock epidemics have put further pressure on the Mongolian meat industry to seek new business opportunities.

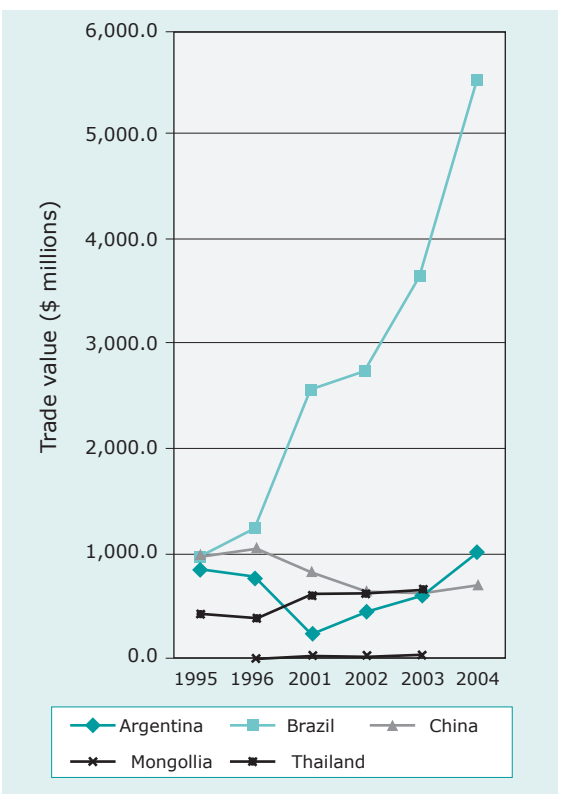
Competitive position on global market

Global market trends

World export market rose to $52.6 billion in 2004 from $39.5 billion in 1995, growing at an average rate of 3.21% p.a.. Brazil's exports showed the biggest increase (21.44% p.a.), followed by Mongolia's (12.37% p.a.), Thailand (5.94% p.a.) and Argentina (2.08% p.a.). China is the only country whose exports have contracted from $1,000 million in 1995 to some $698 million in 2004 (at a 3.92% p.a. negative rate). Figure 7.1 shows the trends in meat exports in the world between 1995 and 2004.

Figure 7.1: Trends in Meat (SITC 011) Exports in the World, 1995-2004





Competitive positioning

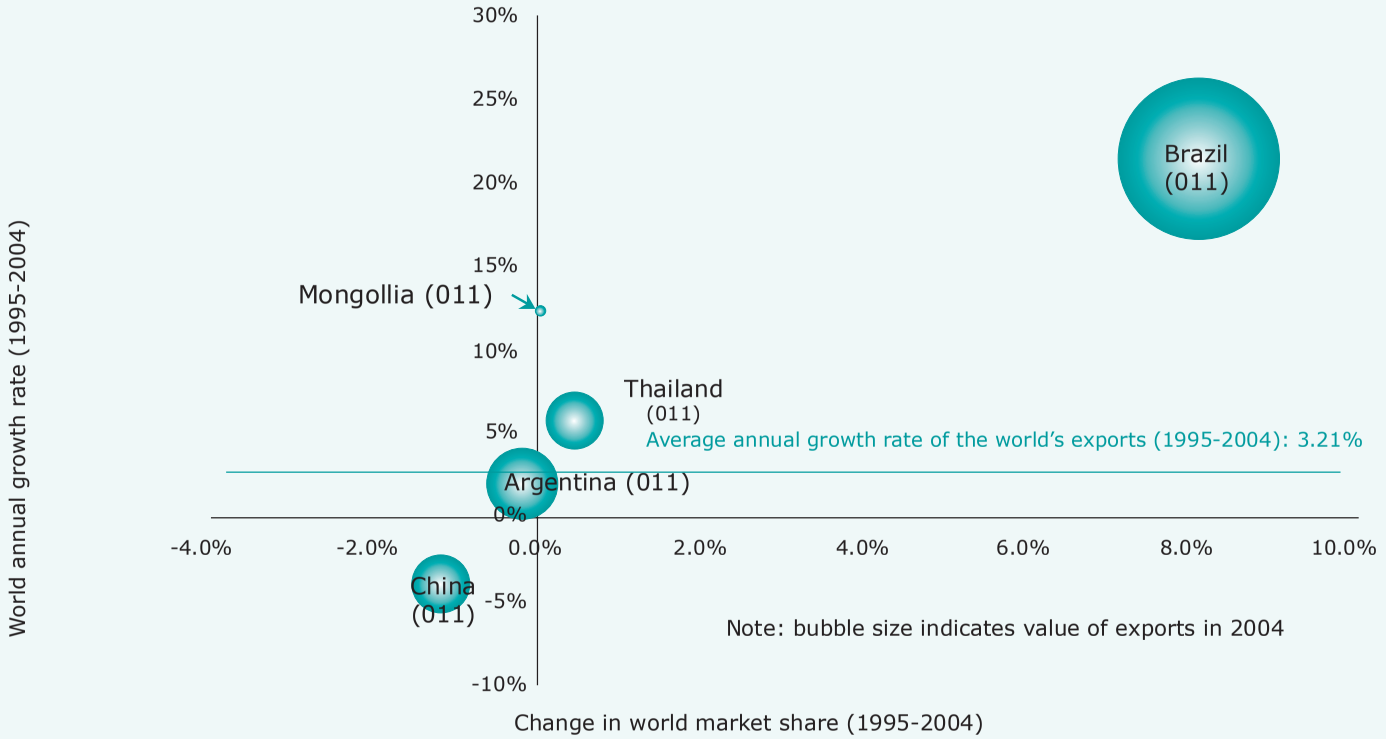
As shown in figure 7.2, Brazil has substantially increased its market share, from 2.43% in 1995 to 10.52% in 2004. Thailand did so to a certain extent (from1.04% in 1995 to 1.46% in 2003). Mongolia registered a lackluster performance (with a market share improving from 0.01% in 1996 to 0.05% in 2002 and regressing to 0.03% in 2003), while both China and Argentina showed a shrinkage in their market share, from respectively 2.52% and 2.15% in 1995 to respectively 1.33% and 1.94% in 2004.

In terms of market positioning, Brazil and, to a lesser extent, Thailand are considered as world's «champions» for meat exports, while China and Argentina are both staying in the «declining sectors» business. Mongolia itself is very much a grey area, falling between two separate categories of «champions» and «underachievers».

Concluding remarks

The Ministry of Food & Agriculture has formulated three programs (Meat Export Program, Livestock Quality, Breeding and Services Program, and Livestock Health Program) to deal with the issues faced by the meat sector. However, these programs have failed to secure sufficient funding for their implementation. Here again, there is a need for the public and private sector to jointly develop a long-term strategy for meat and meat product exports, and to secure funding for the long-term development of the sector.

Figure 7.2: Competitive Positioning of Selected Countries in the Global Market, the Meat Sector (SITC 011), 1995-2004



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15. Mr. K.Bajiikhuu, Director, Public Adm. Dept, National Statistical Office
16. Ms. B.Badamtsetseg, Head, Economic Statistics Div., National Statistical Office
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18. Mr. J.Tuvshinbat, President, Mongolian Hide & Skin Producers Association

19. Dr. S.Deleg, President, Mongolian Meat Association

20. Mr. Batjargal Gunaajav, Counsellor, Mongolian Embassy in Vienna

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