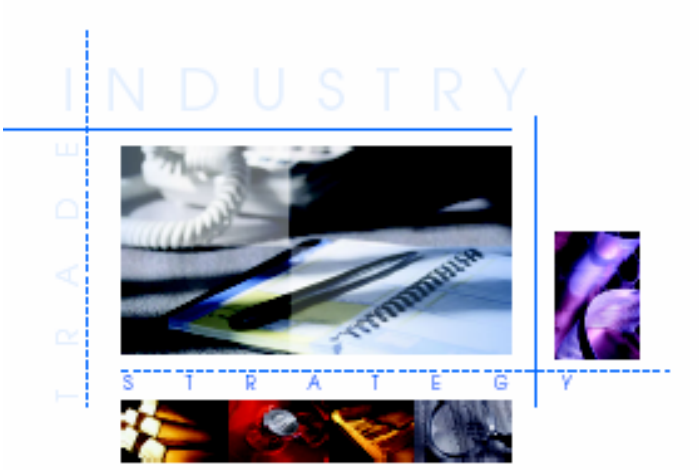
Working Paper 2-2004

The Role of Dynamic Products in Global Integration – Implications for South Africa

Nimrod Zalk



TRADE AND INDUSTRIAL POLICY STRATEGIES

TRADE AND INDUSTRIAL POLICY STRATEGIES (TIPS)

Vision

To be a source of independent economic policy and research leadership to government and civil society in SA and the region.

Mission

- **Developing** an internal critical mass of intellectual capacity to undertake and disseminate groundbreaking and relevant economic research.
- **Stimulating** debate between policy practitioners and the wider research community to generate viable policy options.
- **Building** on our links with key international policy-relevant institutions to draw the quality of our research efforts ever closer to international best practice.

For more information about TIPS and its activities, please visit our website at
http://www.tips.org.za

For enquiries about TIPS' Working Papers and other publications, please contact us at
publications@tips.org.za

TIPS WORKING PAPER SERIES 2004

Author(s)	Title	Format
James Thurlow	A Dynamic Computable General Equilibrium (CGE) Model for SA: Extending the Static IFPRI Model WP 1-2004	Electronic: http://www.tips.org.za/research/papers/showpaper.asp?id=707
Nimrod Zalk	The Role of Dynamic Products in Global Integration – Implications for SA WP2-2004	Electronic: http://www.tips.org.za/research/papers/showpaper.asp?id=741
Ron Sandrey	Non-Tariff Measures Facing Exports from South and Southern Africa WP3-2004	Electronic
Rob Davies and Dirk Ernst van Seventer	A Three-gap and Macro Decomposition Analysis for SA, 1993–2002* WP4-2004	Electronic
James Hodge	Universal Service Through Roll-out Targets and Licence Conditions: Lessons from Telecommunications in SA* WP5-2004	Electronic
Nick Vink	The Influence of Policy on the Roles of Agriculture in SA* WP6-2004	Electronic
Penny Hawkins	SA's Financial Sector Ten Years On: Performance Since Democracy* WP7-2004	Electronic
Simon Roberts	The Role for Competition Policy in Economic Development: The SA Experience* WP8-2004	Electronic

** Presented at the TIPS/DPRU Annual Forum 2003 and published in Development Southern Africa Vol. 21, No. 1, March 2004*

The Role of Dynamic Products in Global Integration – Implications for South Africa

Nimrod Zalk[1]

The Department of Trade and Industry

June 2004

[1] Nimrod Zalk is a Chief Director in the Strategic Competitiveness Unit, Enterprise and Industry Development Division, Department of Trade and Industry (**the dti**), nzalk@dti.pwv.gov.za. The views expressed in this paper are the author's own.

Published 2004
by Trade and Industrial Policy Strategies (TIPS)
P.O. Box 87643, Houghton 2041, Johannesburg, SA

National Library of SA

A catalogue record for this book is available from the National Library of SA

TIPS Working Paper Series (WP2-2004)
The Role of Dynamic Products in Global Integration – Implications for South Africa
by Nimrod Zalk

ISBN: 1-919982-14-0

CONTENTS

TABLES

FIGURES

ACRONYMS

AGOA	Africa Growth and Opportunity Act
CPU	Central Processing Unit
ICT	Information and Communication Technology
MIDP	Motor Industry Development Programme
MVA	Manufacturing Value Added
NAFTA	North American Free Trade Agreement
NIE	Newly Industrialising Economy
OEM	Original Equipment Manufacturers
SA	South Africa
SITC	Standardised Industrial Trade Classification
TNC	Trans-national Corporation
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organisation
WTO	World Trade Organisation

ACKNOWLEDGEMENTS

The contribution of Dirk Ernst van Seventer of TIPS and Katherine Gibson, previously of TIPS, in sourcing and compiling much of the data used in this paper is gratefully acknowledged.

EXECUTIVE SUMMARY

The current phase of globalisation, from the mid-1980s to the present, has been characterised by far-reaching changes in the global trading system. There have been differential economic gains from participation in the global economy, particularly a) between developed and developing countries and b) amongst developing countries. Much has depended on the manner in which countries have been able to make themselves part of the global economy.

Global integration can be viewed from a range of perspectives. This paper interrogates differential country outcomes from a similar perspective as that which a firm might use to locate its activities in a particular market, namely the type of business it is engaged in. We briefly examine what 'businesses' the South African (SA) economy is involved with in the global economy. Specifically, we examine SA's relative presence in the highest growth products in world trade: the top 40 dynamic products.

The paper is split into three sections. The first section examines broad trends in the global economy, as well as the key drivers of these trends. Over the last two decades, non-resource based manufactures have far outstripped the growth in primary products and resource-based manufactures in world trade. Amongst non-resource based manufactures, medium- and high-technology manufactured exports predominate, with the latter demonstrating the highest growth rates. As a group, developing-country exports have grown faster than a) the world average and b) the higher the level of skill and technology intensity of the products exported. However, two divergent trends emerge. First, developed countries have captured disproportionate gains from trade, notwithstanding the fact that their share in world trade has declined. Secondly, there is a wide divergence in export performance amongst developing countries. Economies which have gained share in world trade have been the first- and second-tier East-Asian tigers, coupled with selected economies from Eastern Europe, Latin America and South-East Asia.

These trends have been brought about by a number of key developments in the world economy. Growing, albeit unevenly distributed, global income has driven fundamental changes in global consumer demand towards more sophisticated products and services. Trade and investment liberalisation – at both the multi-lateral and regional level – coupled with advances in transport and information and communication technology (ICT) systems and continued immobility of unskilled labour has heightened competitive pressures and prompted wide-scale shifts in global trade and production. In particular, trans-national corporations (TNCs), based largely in developed countries, have emerged as major co-ordinators of global production. TNCs dominate both producer- and buyer-driven value chains, leading to vertical specialisation in various forms of production.

The second section unpacks dynamic products in world trade in more detail. Two forms of dynamism are distinguished: demand-side or 'market dynamism' and supply-side dynamism. Demand-side dynamism refers to products which have experienced high and sustained growth in world trade, whereas supply-side dynamism provides an indication of the productivity potential of particular groups of products, based on the skill and technology intensity embodied in the final product. However, the role of vertical specialisation blurs this indicator at a country level.

The top 40 (market) dynamic products in world trade are analysed, which comprise 5% of 786 products, yet have shown the most sustained gains in world market share. Collectively they grew from 22% of world market share in 1985, to 37% in 2000. In terms of factor intensity, high- and medium-skill / technology intensive manufactures account for the overwhelming share of dynamic products, with a small share held by labour- or resource-intensive manufactures. No primary products featured amongst dynamic products. By industry grouping, electro-technical products dominate, followed by road motor vehicles, non-electrical machinery, chemicals and apparel. Electro-technical products also demonstrated the highest growth rates amongst dynamic products. Aircraft, pharmaceuticals, wooden furniture, diamonds, toys / games, rubber / plastic products, music and medical instruments also feature as dynamic products.

The analysis then hones in on developing countries' – and specifically SA's (SA's) – share in dynamic products. Developing-country share in each dynamic product is examined as a rough indicator of the barriers to integration into such products. Product groups with the lowest developing-country share included aircraft, chemicals, motor vehicles, medical equipment and particular types of non-electrical machinery, as well as complete computers. These products tend to be research and development or scale intensive. Products with a moderate developing-country share included diamonds, particular types of communications and electrical machinery, music, toys / games, rubber / plastic products and wood products. Products with a relatively high developing-country presence included a number of

communications and computer / office equipment products, some electrical machinery products and apparel.

SA's relative presence in dynamic products is examined at both the aggregate and product-specific level. Three aggregate measures of country-level dynamic product presence are examined. Developing-country presence according to all three measures is heavily dominated by East Asian and East European transition economies. Other economies that feature amongst the top 20 developing countries are Mexico, Turkey, India, Botswana and Mauritius. By all three measures SA ranks relatively low – outside the top 20 developing-country exporters by two of the three measures. Also examined is a rough measure of diversification of dynamic production. By this measure, most East Asian economies, selected east-European economies, Mexico, India and Turkey are present amongst the top 20 exporters of a significant number of dynamic products.

SA's product-specific ranking in the top 40 products is also examined. The country features within the top 20 in a single product – diamonds (6). Other products among SA's highest rankings (between 20 and 30) are in passenger motor vehicles, wooden furniture, aircraft and particular chemicals products.

The last section summarises the findings and suggests some policy implications. Chief amongst these are the following:

- There is a need to examine SA's industrial structure systematically with respect to the industry groups and specific products which have demonstrated sustained growth in world trade.
- In particular, ways in which SA can increase integration into the 'electro-technical' cluster of products should be examined.
- More broadly, the analysis reveals a gap in debates around SA's industrialisation, which have been dominated by the implicit idea that the country's industrial development should proceed in a linear manner from its resource base through successively increasing levels of value addition.
- Integration into TNC-controlled vertical specialisation networks poses both opportunities and challenges for developing countries. The major opportunity is that it is no longer necessary for developing-country firms to master the entire scope of production of a particular product, but can specialise in areas of production where it offers a competitive mix of costs and capabilities. Challenges include competition from other countries in the same capabilities and longer term development of the domestic technological base away from reliance on foreign technologies.
- Further areas for investigation include other relatively high-growth products, particularly high-value agricultural products, as well as fast-growing service outsourcing in world trade.

1 INTRODUCTION

The current phase of globalisation, from the mid-1980s to the present, has been characterised by far-reaching changes in the global trading system. Countries have experienced differential economic gains from participation in the global economy, particularly a) between developed and developing countries and b) amongst developing countries. Much has depended on the manner in which countries have been able to insert themselves into the global economy.

Global integration can be viewed from a range of perspectives[2]. This paper seeks to interrogate these differential country outcomes from a similar perspective as that which a firm might use to locate its activities in a particular market, namely the type of business it is engaged in given a range of industries in which it can invest. In this paper we examine what 'businesses' the SA economy is engaged with in the global economy.

In particular, this paper analyses the evolution of high-growth or 'dynamic' products in world trade, with a distinct focus on SA's presence in these products relative to the best-performing developing economies. This paper is based on the concept of dynamic products in world trade introduced in the 2002 Unctad[3] Trade and Development Report, and extends its analysis to a greater number of products at a higher level of detail.

The remainder of this section provides a high-level overview of changing patterns and drivers of key developments in world trade since the 1980s. First, key trends with respect to the rate and composition of global trade growth are discussed. Secondly, the relationship between developed and developing countries, in terms of the evolution of their respective shares in world manufactures trade and manufacturing value added is considered. Thirdly, the key developments in the global economy that have been driving the identified patterns of trade and income over this period are examined.

Section 3 provides the theoretical basis and empirical evidence on product dynamism in world trade. A definition of product dynamism from both a demand- and supply-side perspective is provided, and a market share-based methodology for calculating demand-side dynamism is adopted. A factor-intensity approach to supply-side dynamism is cautiously adopted. Further, the top 40 dynamic products in world trade over the period 1985 to 2000, at the four-digit SITC[4] level and in terms of industry 'cluster', factor intensity and growth are analysed.

Section 4 examines developing-country presence in dynamic products, and in particular, SA's relative presence in dynamic products. First, it examines developing-country share in dynamic products as a high-level indicator of the barriers to entry into these products in world trade. Secondly, SA's absolute and relative rankings in the top 40 dynamic products are considered.

Section 5 provides some conclusions.

[2] Typically the concept of 'global integration' is treated synonymously to trade 'openness'. Pritchett (1996) points out that there are various measures of trade openness, but that they are often not correlated with each other. In this paper global integration is analysed from the perspective of country presence in particular high growth products in world trade.
[3] United Nations Conference on Trade and Development
[4] Standardised Industrial Trade Classification

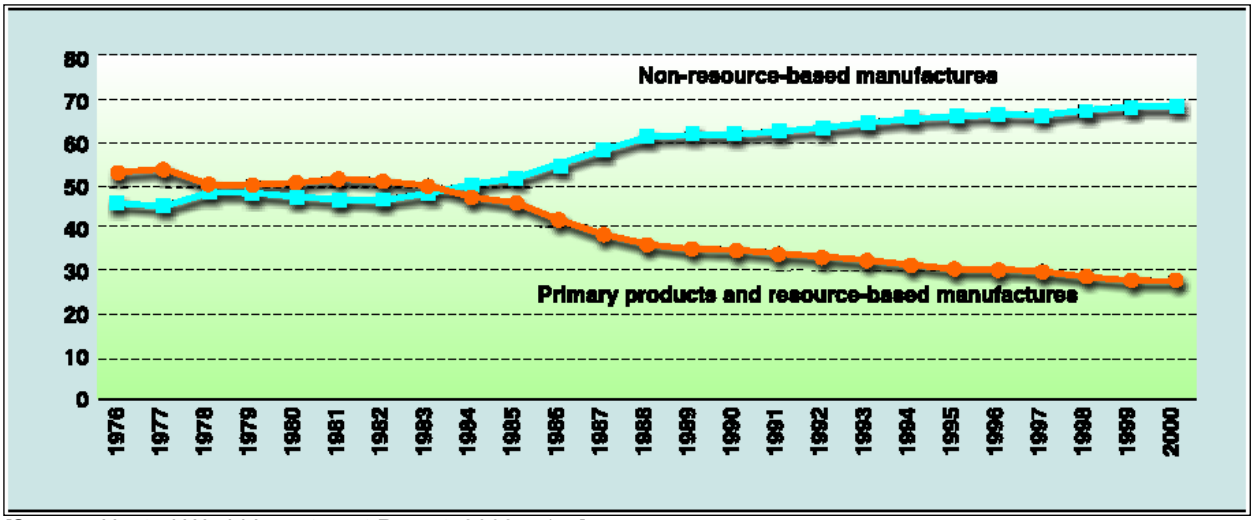
2 CHANGING PATTERNS IN WORLD TRADE

2.1 Trends in merchandise trade

The annual average rate of growth of non-fuel products in world trade over the past two decades (8%) has outstripped the rate of growth of world income and output (less than 6%) by more than two percentage points (Unctad, 2002, p58). As will be discussed in further detail below, a relatively small group of products showed particularly fast growth in world trade.

Figure 1 demonstrates that since the mid-1980s, non-resource based manufactures have by far outstripped primary and resource-based manufactures growth in world trade. By 2000, non-resource based manufactures accounted for around 70% of world merchandise trade.

Figure 1: Growth in primary products and resource-based manufactures versus non-resource based manufactures



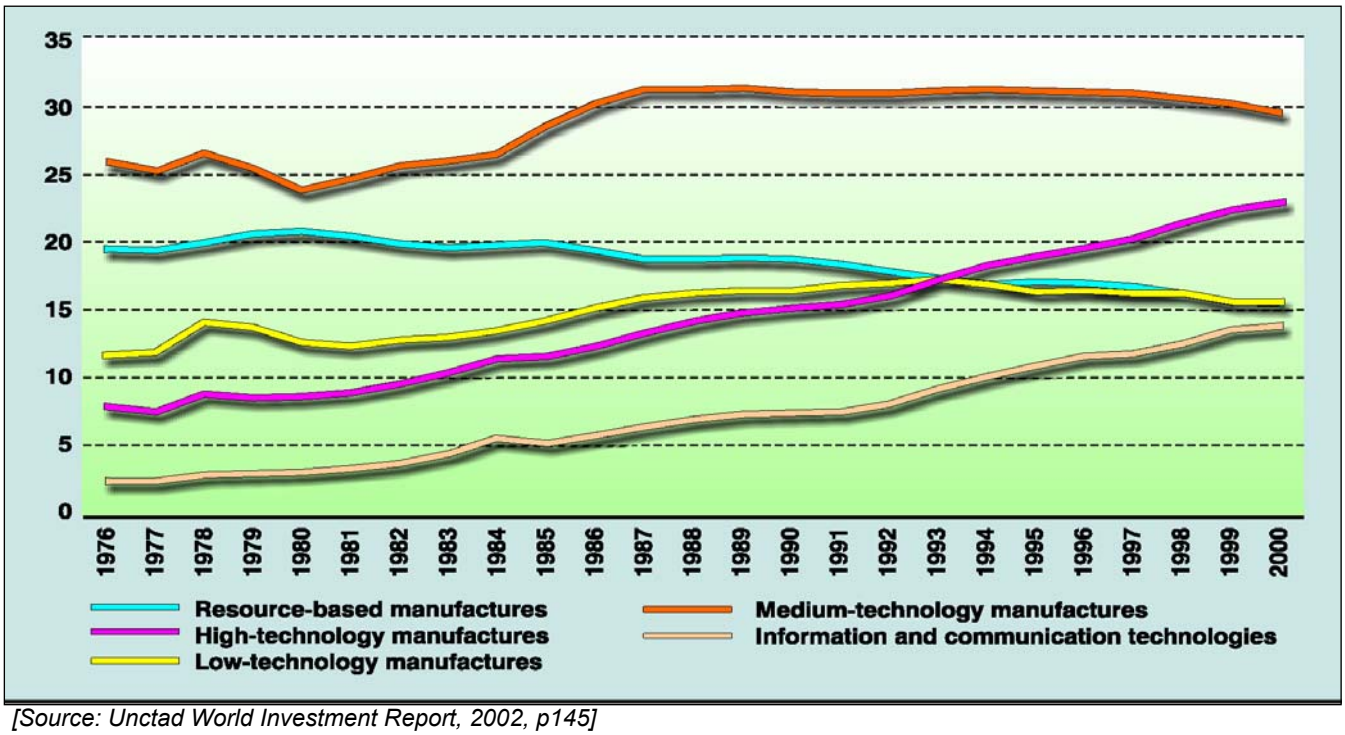
[Source: Unctad World Investment Report, 2002, p144]

2.2 Trends in manufactures trade

Figure 2 focuses on long-run trends within global manufactures trade, demonstrating changing levels of market share amongst manufactures according to their levels of technology intensity. First, medium-technology manufactured exports have consistently held the highest share in manufactured exports over the period 1976 to 2000. Their share grew substantially during the first half of the 1980s and then stabilised at around 30% for the rest of the period.

The fastest-growing group has been high-technology manufactures, which grew from around 7% of market share in 1976 to around 22% by 2000. Of high-tech manufactures, ICTs have demonstrated particularly high and sustained growth, growing from less than 5% prior to the 1980s to close to 15% by 2000. Low-technology manufactures exhibited slower growth in market share, which began to turn down in the early 1990s. By contrast, resource-based manufactures have demonstrated a sustained downward trend in market share, moving from around 20% to 15% over the period.

Figure 2: Market share developments of manufactures according to technology intensity



[Source: Unctad World Investment Report, 2002, p145]

2.3 Trends in country market share

Table 1 shows that the higher the level of technology and skill intensity, the more developing countries have gained market share in world trade. In fact, the product category in which developing countries have experienced the greatest, and only, decline in world market share (from more than 50% to less than 20%) is in primary commodities. However, as will be discussed below, developing countries' growth in the more skill- and technology-intensive areas of world merchandise trade has generally been in the *relatively* labour-intensive parts of global value chains.

Table 1: Structure of non-fuel exports by factor intensity, 1980 and 1998 (% share)

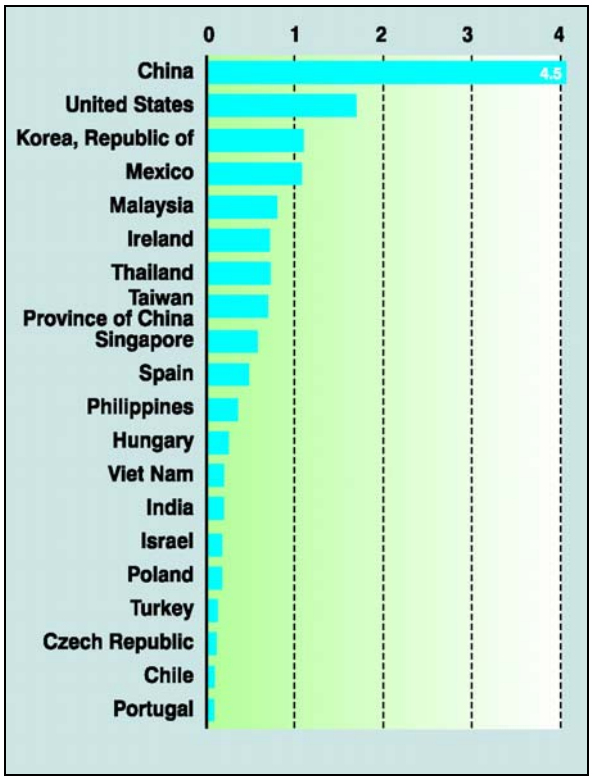
	Share in exports from developing countries			Share in world exports		
Product category	**1980**	**1998**	**Change 80-98**	**1980**	**1998**	**Change 80-98**
Primary commodities	50.8	19.0	**-31.8**	25.7	14.8	**-10.9**
Labour-intensive and resource-based manufactures	21.8	23.2	**1.4**	14.7	15.0	**0.3**
Manufactures with low skill and technology intensity	5.8	7.3	**1.5**	10.1	7.6	**-2.5**
Manufactures with medium skill and technology intensity	8.2	16.8	**8.6**	26.4	29.6	**3.2**
Manufactures with high skill and technology intensity	11.6	31.0	**19.4**	20.2	30.2	**10.0**

[Source: Unctad Trade and Development Report, 2002, p68]

In addition, the gains made in world trade by developing countries as a group have been very unevenly distributed. Figure 3 below demonstrates that amongst the top 20 countries that experienced gains in world market share over the period 1985 to 2000, 15 were developing economies. However, the regional distribution of these economies is highly concentrated. Nine of these economies are East Asian: China, Korea, Malaysia, Thailand, Taiwan, Singapore, Philippines and Vietnam. Except for Vietnam, these economies are all amongst the top 10. By regional grouping, the next-largest set is made up of east European transition economies: Hungary, Poland and Czech Republic. This is followed by Mexico and Chile (Latin America), with the former demonstrating the third-largest gain. Other developing economies in the top 20 are India and Turkey. SA experienced a decline in world market share of 0.2% over the period[5].

[5] World Trade Database data

Figure 3: The top 20 economies by gains in world market share, 1985-2000



[Source: Unctad World Investment Report, 2002, p144]

Therefore the gains in world market share are heavily concentrated amongst developing countries. China, Mexico and the first- and second-tier East Asian Newly Industrialising Economies (NIEs) have experienced the largest gains in market share. In other regions, a relatively small number of countries have registered gains, and only two in Africa.

2.4 Export growth and income growth: not synonymous

Growth in exports does not automatically translate to a corresponding growth in the income from such exports. Table 2 summarises the changing share between developed and developing countries of global shares in exports of manufactures, and the income from manufacturing (manufacturing value added, or MVA). It also disaggregates these relationships for selected developing-country regional and trade groupings.

The focus on manufactures is important for a number of reasons. First, as Table 1 demonstrates, developing countries' share in all technology categories of manufactures has increased over the past two decades. More importantly, economic theory considers manufactures and manufactured exports as particularly important for developing countries as they can provide an escape route from the declining terms of trade, price instability and low income elasticities of demand that face exports of primary and semi-processed commodities. More recently, relatively unsophisticated manufactures have themselves become commoditised, due in large part to the large-scale entry of China and India into the global trading system. For small to medium-size economies, manufactured exports offer the potential to realise economies of scale which the domestic economy may not be able to support.

Table 2 demonstrates that growth in manufactured exports from developing countries as a group has outstripped that of developed countries over the period 1980 to 1997. Developing countries have more than doubled their share in world manufactures trade – from 11% to 27% over this period. By contrast, developed-country share of manufactured exports has declined, from 82% to 71% over the period.

Notwithstanding this decline in world market share of manufactured exports, developed countries have significantly increased their share in MVA over the same period – from 65% to 73%. Developing countries also increased their share in world MVA, from 17% to 24%, but not at the same rate as they increased their share in manufactured exports.

Table 2: Share of selected regional groups and developing economies in world exports of manufactures and manufacturing value-added, 1980 and 1997

	Share in world exports of manufactures		Share in world manufacturing value added	
Region/economy	**1980**	**1997**	**1980**	**1997**
Developed countries	82.3	70.9	64.5	73.3
Developing countries	10.6	26.5	16.6	23.8
Latin America	1.5	3.5	7.1	6.7
Argentina	0.2	0.2	0.9	0.9
Brazil	0.7	0.7	2.9	2.7
Chile	-	0.1	0.2	0.2
Mexico	0.2	2.2	1.9	1.2
			Subtotal	*5.0*
South and East Asia	6.0[a]	16.9	7.3	14.0
NIEs (First-tier)	*5.1*	*8.9*	*1.7*	*4.5*
Hong Kong (China)	0.2	0.6	0.3	0.2
Republic of Korea	1.4	2.9	0.7	2.3
Singapore	0.9	2.6	0.1	0.4
Taiwan Province of China	1.6	2.8	0.6	1.6
ASEAN-4 (Second-tier NIEs)	*0.6*	*3.6*	*1.2*	*2.6*
Indonesia	0.1	0.6	0.4	1.0
Malaysia	0.2	1.5	0.2	0.5
Philippines	0.1	0.5	0.3	0.3
Thailand	0.2	1.0	0.3	0.8
China	1.1[b]	3.8	3.3	5.8
India	0.4	0.6	1.1	1.1
Turkey	0.1	0.5	0.4	0.5

[Source: Unctad, Trade and Development Report, 2002, p81. Notes: a) Excluding China, b) 1984]

Latin America, South and East Asia, and Turkey combined accounted for 21% of the 24% in world MVA of developing countries in 1997. Of this, South and East Asia accounted for the lion's share, namely 14%. Within South East Asia, four economies dominate: China (5.8%), Korea (2.3%), Taiwan (1.6%) and India (1.1%).

Within Latin America, the four major economies account for 5.0% of the region's 6.7% share in world MVA. Argentina and Brazil have maintained their shares in exports over the period. The former also maintained its share in MVA, while Brazil lost 0.2% share, from 2.9% in 1980.

Unfortunately data is not presented for East European transition economies, but their economic reintegration into Europe would suggest that they should also have increased their share in world manufactures trade and MVA over recent years.

This empirical evidence has important implications for developing countries. It suggests that developing countries will have to export relatively more than developed economies to generate the same unit of value. Consequently, it becomes particularly important to integrate into products in world trade that have the highest demand growth, as well as scope for productivity growth. Section 3 of the paper provides a detailed discussion of market-dynamic – or fast-growth – products in world trade. However, prior to doing so it is necessary to examine the key drivers that have resulted in changing patterns in world trade over the last two decades.

3 DRIVERS OF CHANGING PATTERNS IN WORLD TRADE

A set of broad factors can be identified as the key drivers of the changing patterns in world trade over the last two decades.

3.1 Increasing global income

Global income has grown by less than 6% on average since 1980. Higher – although unevenly distributed – income has lead to larger volumes demanded in world trade.

Higher growth in income has also changed the patterns of global demand fundamentally. First, as predicted by Engel's law, higher incomes result in proportionately less being spent on food and other basic commodities. This has probably been a significant contributor to the declining terms of trade experienced by agricultural products, and hence to the stagnant demand growth of primary and resource-based manufactures. More recently, relatively unsophisticated manufactures have themselves become commoditised, due in large part to the large-scale entry of China and India into the global trading system.

Secondly, higher incomes lead to greater demand for more sophisticated, higher quality and more differentiated products in world trade. This is one of the factors attributing to high growth in 'market dynamic' products discussed in Section 3 below.

3.2 Policy liberalisation

Trade liberalisation

As a result of multilateral commitments under the Uruguay Round of 1994 and various regional trade agreements, there has been substantial trade liberalisation over the last decade. However, this liberalisation has been selective in that it has excluded or limited liberalisation in sectors considered sensitive by developed countries, including agriculture and clothing and textiles. Similarly, tariffs on manufactured products tend to escalate in proportion to value added. In addition, developing-country imports have been subject to other barriers to trade, such as various forms of non-tariff barriers and contingent protection, for example, anti-dumping duties. Notwithstanding these barriers, there has been a broad increase in market access of many developing countries to developed country markets in most manufactured goods, sometimes through some form of unilateral trade concessions, such as the Africa Growth and Opportunity Act (Agoa).

Regional trade agreements and regionalism

Much trade liberalisation has been driven at the multi-lateral level. However, regional trade liberalisation and regionalism more generally have also played a major role in shaping global trade and production over the last two decades. Proximity to one of the three large global markets: the United States (US), European Union (EU) and Japan, has been particularly important for a number of developing countries in terms of exports and foreign direct investment, especially the former two.

The following developments have been particularly important.

- The role of Nafta[6] in Mexico's economic development trajectory; and
- The importance of proximity to the European market for Turkey, and, more recently, the Eastern European transition economies.

Interestingly, this pattern of strong intra-regional trade, centred on the dominant regional economy, generally does not emerge as strongly with respect to the first- and second-tier East Asian NIEs on the one hand and Japan on the other. Appendix A demonstrates that with the exception of Indonesia, the US predominates over Japan as an export destination for the East Asian NIEs.

Capital market and foreign investment liberalisation

Simultaneously there has been substantial liberalisation with respect to short- and long-term cross-border capital flows. With regard to the latter, major policy shifts have included agreements on non-discrimination against foreign investors, unhindered profit remittance and double taxation agreements. Many of these changes have been driven at the multilateral level via the World Trade Organisation (WTO) through agreements such as the *Agreement on Subsidies and Countervailing Measures* and the *Trade-related Investment Measures*. However, much investment liberalisation has also been driven by domestic policy shifts towards genuine encouragement of foreign direct investment.

[6] North American Free Trade Agreement

Continued immobility of unskilled labour

While the flow of goods and capital has become more mobile, international movement of unskilled labour remains largely restricted. The immobility of relatively unskilled labour has resulted in the location of investment and production of (low-cost) labour-intensive activities in countries with a relative abundance of these resources.

Developments in technology and transport

Alongside the policy shifts identified above, there have been significant advances in technology which also have implications for the nature of international production and trade. The ICT revolution has resulted in communication technologies which allow for instantaneous communication across the globe. This, coupled with advances in transport and logistics, means that complex production systems can be split and co-ordinated across different locations, often in different countries.

The growing role of international production sharing arrangements: vertical specialisation

The culmination of these policy and technological changes has been a major change in terms of global corporate strategy, particularly that of TNCs. Unctad (2002b, p63) estimates that 30% of world trade is accounted for by production that takes place under the direct or indirect control of TNC-managed networks.

The increased ability of TNCs to locate different parts of their value chains in distinct geographic locations has increased international competitiveness. Cost advantages can be found in locations where, for example, labour rates are low and sufficient skills are available. More advanced activities such as research and development can be located in other locations, where the prevailing economies of agglomeration support such activity, for example, the presence of universities and a supply of post-graduate researchers.

This has placed pressure on firms to concentrate on their 'core competencies' and outsource 'non-core' activities. It has also driven a process of mergers and acquisitions, as corporates have been forced to consolidate to be significant global players in their area of specialisation. Table 3 provides examples of global consolidation in a broad range of sectors. Single firms across a broad range of sectors dominate the world market or hold high market shares. These include both producer- and buyer-driven value chains (*see Box 2.1 for a description of different types of value chains*).

Table 3: Global oligopoly in selected industries (1998-2000)

Company name	Sector	Global Market Share (%)
Aerospace		
Boeing	Commercial aircraft orders over 100 seats	70
Airbus	Commercial aircraft orders over 100 seats	30
GE	Aero-engine orders	53
Rolls-Royce	Aero-engine orders	34
Pratt & Whitney	Aero-engine orders	13
IT		
Lucent	Internet and telecoms equipment	17
Intel	Micro-processors	85
Microsoft	PC operating systems	85
Microsoft	Business desktop computer applications	90
Cisco	Computer routers	66
	High-end routers	80
Corning	Optical fibres	50
Hyundai Electronics	DRAMS	21
Samsung Electronics	DRAMS	20
Sony	Electronic games	67
Nintendo	Electronic games	29
Ericsson	Mobile phones	15
Nokia	Mobile phones	23
Motorola	Mobile phones	20
Pharmaceuticals		
Glaxo Wellcome/SKB	Prescription drugs	7
	Central nervous system drugs	12
	Anti-infection	17
	Respiratory	17
	Anti-asthma	31
	Anti-herpes	49
Merck	Prescription drugs	5
	Statin anti-cholesterol	40
	Angiotension converting enzyme inhibitors	30
Medtronic	Implantable/interventional therapy technologies*	45
	Pacemakers	50+
Vehicles		
Ford	Automobiles	16
GM	Automobiles	15
Daimler-Chrysler	Automobiles	10
VW	Automobiles	9
Toyota	Automobiles	9
Renault/Nissan	Automobiles	9
Vehicle Components		
Pilkington	Auto glass	25
GKN	Constant velocity joints	40
Tenneco	Shock absorbers/car exhaust systems	25
Bosch	Brake systems	31
Lucas	Brake systems	25
Bridgestone	Tyres	19
Michelin	Tyres	18
Goodyear	Tyres	14
Petrochemicals		
BP Amoco	PTA	37
	Acetic acid (technology licences)	70
	Acrylonite (technology licences)	90
Complex Equipment		
Invensys	Control/automation equipment	11

Company name	Sector	Global Market Share (%)
Siemens	Control/automation equipment	10
ABB	Control/automation equipment	9
Emerson	Control/automation equipment	8
Fanuc	Machine tool controls	45
Schindler	Lifts	25
Otis	Lifts	18
Misubishi	Lifts	13
Kone	Lifts	9
Fast-moving consumer goods		
Coca-Cola	Carbonated soft drinks	51
Procter and Gamble	Tampons	48
Gillette	Razors	70
Fuji Film	Camera films	35
Chupa Chups	Lollipops	34
Nike	Sneakers	36
Packaging		
Toray	Polyester film	60
Sidel	PET plastic packaging machines	55
Alcoa/Reynolds	Aluminium	24
Power Equipment		
GE	Gas turbines (1993-98)	34
Siemens/ Westinghouse		32
ABB/Alstom		21

*[Source: Nolan, 2001, pp104-106] Note: *Including pacemakers, implantable defibrillators, leads, programmers for treatment of patients with irregular heart-beats*

Consequently, the growing role of TNCs in co-ordinating global production and driving production-sharing arrangements has resulted in a phenomenon termed vertical specialisation (Hummels, Rapoport and Yi, 1998). Whereas countries and companies traditionally specialised in the production of particular products, vertical specialisation involves specialisation by countries and companies in particular parts of value chains.

Developed-country based firms (typically TNCs), generally dominate the highest value-adding functions in both producer- and buyer-led value chains. This involves substantial control over functions such as research and development, branding, distribution and marketing. Less knowledge-intensive and more labour-intensive functions are outsourced to developing economies with the right mix of costs and capabilities, even in relatively high-skill and -technology products. An important manifestation of this has been the growth in parts and components in world trade (Unctad, 2002a, p145).

Types of value chains

Broadly two types of value chains – buyer-driven and producer-driven – can be distinguished.

Producer-driven commodity chains are those in which large, usually transnational, manufacturers play the central roles in co-ordinating production networks (including their backward and forward linkages). This is characteristic of capital- and technology-intensive industries such as automobiles, aircraft, computers, semiconductors, and heavy machinery.

Buyer-driven commodity chains refer to those industries in which large retailers, marketers and branded manufacturers play the pivotal roles in setting up decentralised production networks in a variety of exporting countries, typically located in the third world. This pattern of trade-led industrialisation has become common in labour-intensive, consumer goods industries such as garments, footwear, toys, housewares, consumer electronics and a variety of handicrafts. Production is generally carried out by tiered networks of third-world contractors that make finished goods for foreign buyers. The specifications are supplied by the large retailers or marketers that order the goods.

Gereffi in Kaplinsky and Morris, 2001, p33

Table 4 below provides a typology of the broad characteristics of the two types of value chains. A key distinction between the two is that producer-driven chains tend to exercise more direct control or monitoring over production along the chain, whereas buyer-driven chains are based on a looser arrangement within a network. Closely related to this are the core competencies involved. In the former type of chain, an emphasis on technology requires closer links between original equipment manufacturers (OEMs) and their suppliers to ensure that the demanding standards required in production are met. With respect to the latter, core competence resides in design, marketing and distribution, with production outsourced to firms (generally in developing countries) that can meet both the quality and price requirements of the retailer.

Table 4: Producer- and buyer-driven value chains compared

	Producer-driven value chains	Buyer-driven value chains
Drivers of global value chains	▪ Industrial capital	▪ Commercial capital
Core competencies	▪ R&D ▪ Development ▪ Production	▪ Design ▪ Marketing
Barriers to entry	▪ Economies of scale	▪ Economies of scope
Economic sectors	▪ Consumer durables ▪ Intermediate goods ▪ Capital goods	▪ Consumer non-durables
Typical industries	▪ Automobiles ▪ Computers ▪ Aircraft	▪ Apparel ▪ Footwear ▪ Toys
Ownership of manufacturing firms	▪ Transnational firms	▪ Local firms, predominantly in developing countries
Main network links	▪ Investment-based	▪ Trade-based
Predominant network structure	▪ Vertical	▪ Horizontal

[Source: Adapted from Gereffi in Kaplinsky and Morris, 2001, p34]

A combination of the growth in such production-sharing arrangements, coupled with general and regional policy liberalisation, has driven much of the growth and patterns of trade over the last two decades. This process has created a complex set of opportunities and challenges for developing countries.

4 PRODUCT DYNAMISM IN WORLD TRADE

4.1 The nature of product dynamism

The significance of product dynamism

Product dynamism is relevant for developing-country export strategies for two main reasons. First, production for high-demand growth markets in world trade can limit the risk of countries becoming stuck in stagnant or declining markets, or falling victim to the fallacy of composition, where a number of countries simultaneously enter the same markets, increasing competition and driving down prices (Meyer *et al*., p1-2).

Secondly, integration into products which have high potential for productivity is important to generate increasing income growth over time. It is generally accepted that the prospect for productivity upgrading within primary production is limited and that manufacturing offers the highest potential for productivity upgrading (Unido[7], p11) – although certain primary products do offer growth and productivity upgrading potential. Similarly the increasing role of services in world trade should not be ignored, despite it being less well captured in international trade statistics.

Meyer *et al*. and Unctad (2002b) identify two forms of product dynamism. Products which exhibit demand or market dynamism are characterised by high, stable and sustained growth rates in world trade. Products which display supply-side dynamism are those which have the highest potential for increases in productivity and hence for increases in the income accrued from the production of such products.

Demand or 'market dynamism'

Meyer *et al*. (p5-6) state that a measure of dynamism needs to take into account – not just the average annual growth of a product, but also the volatility and predictability of such growth. They therefore propose a composite index to determine market dynamic products.

The 2002 World Investment Report (p147) calculates product dynamism in a slightly different but simpler manner as the increment in world market share that individual products have displayed over the period of interest, in this case 1985 to 2000. The Report's approach implicitly incorporates the elements identified by Meyer *et al*. and is adopted in this paper.

Unless otherwise stated, the terms 'product dynamism' or 'dynamism' in this paper refer to market dynamism.

Supply-side dynamism: productivity potential

Supply or productivity dynamism is more difficult to capture in a single measure. Meyer *et al*. (p2) suggest three possible alternatives. First, the potential for productivity growth in particular industries may be obtained from existing industry studies. Typically such studies are only available for developed economies. Secondly, productivity growth potential can be approximated, based on the factor intensity of different products, particularly their skill and technology intensity. A third approach is to distinguish products according to the main factors which impact on their competitive process[8].

Here the factor intensity approach is adopted. Five categories of products are identified, four of which are manufactures.

- Non-fuel primary commodities
- Manufactures
  - Labour and resource intensive
  - Low skill / technology intensity
  - Medium skill / technology intensity
  - High skill / technology intensity

The factor intensity approach is based on the assumption that the skill and technology intensity of production in particular products provides a rough approximation of the scope for productivity upgrading (supply dynamism), that is, the higher the level of skill and technology intensity, the greater the scope for productivity upgrading.

[7] United Nations Industrial Development Organisation
[8] Six categories are distinguished: non-fuel primary commodities, labour-intensive manufactures, scale-intensive manufactures, resource-intensive manufactures, specialised-supplier related manufactures, and science-based manufactures.

This categorisation is roughly accurate at a product-by-product level. However, at a country/product level it should be interpreted more cautiously as the increasing role of vertical specialisation in world trade means that products are decreasingly produced in only one country. Production increasingly spans multiple countries, with relatively labour-intensive parts of production being transferred to developing countries with a competitive combination of costs and capabilities.

However, it remains useful for analysing the trade structure of developing countries because even relatively labour-intensive components of medium-high skill and technology intensive production require substantial industrial capabilities.

5 THE TOP 40 DYNAMIC PRODUCTS IN WORLD TRADE

Table 5 below lists the 40 most market dynamic products in world trade over the period 1985 to 2000 at the SITC[9] four-digit level. These are the products which have experienced the highest and most sustained growth in world trade over this period in terms of their growth in world market share. This analysis excludes products with a very small share[10] in world trade as well as oil-based commodities.

Collectively these products grew from a 22% share in world trade in 1985 to 37% in 2000, or a growth in world market share of 15%. Thus 5% of the 786 products at the SITC four-digit level account for close to 40% of world merchandise trade.

Table 5: Top 40 dynamic products in world trade, market share, value and average growth, 1985-2000

			Market Share			Value		
Rank	SITC code	Product	1985	2000	Increment	1985	2000	Annual growth rate
1	7764	Electronic microcircuits	0.82	3.38	2.56	13,976	186,887	18.9
2	7599	Parts and accessories for data processing machines	1.02	2.33	1.30	17,446	128,882	14.3
3	7524	Digital central storage units, separately consigned	0.02	1.01	0.99	295	55,942	41.9
4	7643	Television, radio and related transmitters and receivers	0.11	0.91	0.81	1,811	50,614	24.9
5	5417	Medicaments	0.53	1.24	0.71	8,985	68,452	14.5
6	7649	Parts and accessories for telecom and recording apparatus (n.e.s)	0.67	1.28	0.61	11,346	70,633	13.0
7	7641	Telephonic and telegraphic apparatus	0.28	0.83	0.55	4,704	45,962	16.4
8	7523	Complete digital central processing units	0.30	0.74	0.44	5,160	40,845	14.8
9	7721	Electrical apparatus for making/breaking electrical circuits	0.64	1.05	0.41	10,919	58,297	11.8
10	7788	Other electrical machinery and equipment (n.e.s)	0.48	0.86	0.39	8,132	47,829	12.5
11	8942	Children's toys, indoor games	0.40	0.79	0.39	6,804	43,509	13.2
12	8939	Miscellaneous articles of chemicals	0.40	0.77	0.37	6,815	42,483	13.0
13	7924	Aircraft, mechanically propelled (other than helicopters)	0.44	0.78	0.34	7,496	43,222	12.4
14	7525	Peripheral units for data processing equipment	0.66	0.98	0.32	11,248	54,390	11.1
15	7712	Other electric power machinery and parts (n.e.s)	0.17	0.49	0.32	2,829	26,929	16.2
16	7731	Insulated electric wire, cable, bars, strip and the like	0.29	0.60	0.30	5,012	33,062	13.4
17	5148	Other nitrogen-function compounds	0.15	0.45	0.30	2,578	25,009	16.4
18	8462	Under garments, knitted or crocheted, of cotton	0.16	0.44	0.28	2,714	24,145	15.7
19	7768	Piezo-electric crystals, parts of transistors and cathode valves (n.e.s)	0.31	0.58	0.27	5,285	32,259	12.8
20	7522	Complete digital data processing machines	0.20	0.47	0.27	3,400	26,035	14.5
21	7810	Passenger motor cars	4.90	5.15	0.25	83,547	285,222	8.5
22	5839	Other polymerisation and copolymerisation products	0.16	0.40	0.24	2,736	22,087	14.9
23	8219	Other furniture and parts (n.e.s)	0.32	0.55	0.22	5,495	30,281	12.1
24	7763	Diodes, transistors and similar semiconductor devices	0.22	0.42	0.20	3,735	23,025	12.9
25	7149	Parts of non-electrical engines and motors (n.e.s)	0.28	0.46	0.19	4,712	25,648	12.0
26	8211	Chairs and other seats	0.26	0.43	0.18	4,366	24,006	12.0
27	8983	Gramophone records and other sound or similar recordings	0.33	0.50	0.17	5,609	27,880	11.3
28	8720	Medical instruments and appliances (n.e.s)	0.24	0.41	0.17	4,122	22,722	12.1
29	8451	Jerseys, pullovers, twin-sets, cardigans, jumpers etc.	0.39	0.54	0.15	6,594	29,987	10.6
30	8439	Other outer garments, women's, girls', infants', of textile fabrics	0.30	0.45	0.15	5,161	25,015	11.1
31	7284	Machinery and parts for specialized industries	0.68	0.82	0.14	11,618	45,617	9.6
32	7132	Internal combustion piston engines for road vehicles	0.45	0.58	0.14	7,599	32,368	10.1
33	5989	Chemical products and preparations (n.e.s)	0.45	0.58	0.13	7,603	31,865	10.0
34	7611	Television receivers, colour	0.27	0.40	0.13	4,589	21,955	11.0
35	5156	Heterocyclic compounds; nucleic acids	0.32	0.44	0.12	5,445	24,599	10.6
36	7849	Other parts and accessories of motor vehicles (n.e.s)	2.23	2.33	0.10	37,954	129,051	8.5

[9] Revision 2
[10] Less than 0.33% share in world trade

37	6672	Diamonds (except sorted industrial diamonds), unworked, cut	0.83	0.92	0.09	14,166	50,741	8.9
38	7139	Parts of the internal combustion piston engines (n.e.s)	0.34	0.40	0.06	5,814	22,249	9.4
39	7492	Taps, cocks, valves etc. for pipes, boiler shells, tanks, vats	0.34	0.40	0.06	5,854	22,168	9.3
40	7929	Aircraft parts (n.e.s) (except tyres, engines, electrical parts)	0.49	0.53	0.04	8,334	29,475	8.8
		Total above products	**21.85**	**36.69**	**14.87**	**372,006**	**2,031,347**	**12.0**

[Source: Unctad, World Investment Report, 2002, p147]

Table 6: Top 40 dynamic products in world trade, detailed breakdown, 1985-2000

A	B	C	D	E	F	G
SITC code	**Product**	**Market Share 2000**	**Annual growth rate 1985-2000**	**Industry Grouping**	**Factor intensity**	**Main competitive factor**
5148	Other nitrogen-function compounds	0.45	16.4	Chemicals	Manufs - high skill / technology	Scale-intensive manufs.
5156	Heterocyclic compounds; nucleic acids	0.44	10.6	Chemicals	Manufs - high skill / technology	Scale-intensive manufs.
5417	Medicaments	1.24	14.5	Pharmaceuticals	Manufs - high skill / technology	Science-based manufs.
5839	Other polymerisation and copolymerisation products	0.40	14.9	Chemicals	Manufs - high skill / technology	Scale-intensive manufs.
5989	Chemical products and preparations (n.e.s)	0.58	10.0	Chemicals	Manufs - high skill / technology	Scale-intensive manufs.
6672	Diamonds (except sorted industrial diamonds), unworked, cut	0.92	8.9	Diamonds	Manufs - labour / resource intensive	Resource-intensive manufs.
7132	Internal combustion piston engines for road vehicles	0.58	10.1	Non-electrical machinery	Manufs - medium skill / technology	Differentiated prods. requiring specialised suppliers
7139	Parts of the internal combustion piston engines (n.e.s)	0.40	9.4	Non-electrical machinery	Manufs - medium skill / technology	Differentiated prods. requiring specialised suppliers
7149	Parts of non-electrical engines and motors (n.e.s)	0.46	12.0	Non-electrical machinery	Manufs - medium skill / technology	Differentiated prods. requiring specialised suppliers
7284	Machinery and parts for specialized industries	0.82	9.6	Non-electrical machinery	Manufs - medium skill / technology	Differentiated prods. requiring specialised suppliers
7492	Taps, cocks, valves etc. for pipes, boiler shells, tanks, vats	0.40	9.3	Non-electrical machinery	Manufs - medium skill / technology	Differentiated prods. requiring specialised suppliers
7522	Complete digital data processing machines	0.47	14.5	Computers and office equipment	Manufs - high skill / technology	Science-based manufs.
7523	Complete digital central processing units	0.74	14.8	Computers and office equipment	Manufs - high skill / technology	Science-based manufs.
7524	Digital central storage units, separately consigned	1.01	41.9	Computers and office equipment	Manufs - high skill / technology	Science-based manufs.
7525	Peripheral units for data processing equipment	0.98	11.1	Computers and office equipment	Manufs - high skill / technology	Science-based manufs.
7599	Parts and accessories for data processing machines	2.33	14.3	Computers and office equipment	Manufs - high skill / technology	Science-based manufs.
7611	Television receivers, colour	0.40	11.0	Communications equipment	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7641	Telephonic and telegraphic apparatus	0.83	16.4	Communications equipment	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7643	Television, radio and related transmitters and receivers	0.91	24.9	Communications equipment	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7649	Parts and accessories for telecom and recording apparatus (n.e.s)	1.28	13.0	Communications equipment	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7712	Other electric power machinery and parts (n.e.s)	0.49	16.2	Electrical machinery	Manufs - medium skill /	Differentiated prods. requiring specialised

					technology	suppliers
7721	Electrical apparatus for making/breaking electrical circuits	1.05	11.8	Electrical machinery	Manufs - medium skill / technology	Differentiated prods. requiring specialised suppliers
7731	Insulated electric wire, cable, bars, strip and the like	0.60	13.4	Electrical machinery	Manufs - medium skill / technology	Differentiated prods. requiring specialised suppliers
7763	Diodes, transistors and similar semiconductor devices	0.42	12.9	Electrical machinery	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7764	Electronic microcircuits	3.38	18.9	Electrical machinery	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7768	Piezo-electric crystals, parts of transistors and cathode valves (n.e.s)	0.58	12.8	Electrical machinery	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7788	Other electrical machinery and equipment (n.e.s)	0.86	12.5	Electrical machinery	Manufs - high skill / technology	Differentiated prods. requiring specialised suppliers
7810	Passenger motor vehicles	5.15	8.5	Road motor vehicles	Manufs - medium skill / technology	Scale-intensive manufs.
7849	Other parts and accessories of motor vehicles (n.e.s)	2.33	8.5	Road motor vehicles	Manufs - medium skill / technology	Scale-intensive manufs.
7924	Aircraft, mechanically propelled (other than helicopters)	0.78	12.4	Aircraft	Manufs - high skill / technology	Science-based manufs.
7929	Aircraft parts (n.e.s) (except tyres, engines, electrical parts)	0.53	8.8	Aircraft	Manufs - high skill / technology	Science-based manufs.
8211	Chairs and other seats	0.43	12.0	Wooden furniture	Manufs - labour / resource intensive	Resource-intensive manufs.
8219	Other furniture and parts (n.e.s)	0.55	12.1	Wooden furniture	Manufs - labour / resource intensive	Resource-intensive manufs.
8439	Other outer garments, women's, girls', infants', of textile fabrics	0.45	11.1	Apparel	Manufs - labour / resource intensive	Labour intensive manufs.
8451	Jerseys, pullovers, twin-sets, cardigans, jumpers etc.	0.54	10.6	Apparel	Manufs - labour / resource intensive	Labour intensive manufs.
8462	Under garments, knitted or crocheted, of cotton	0.44	15.7	Apparel	Manufs - labour / resource intensive	Labour intensive manufs.
8720	Medical instruments and appliances (n.e.s)	0.41	12.1	Medical instruments	Manufs - high skill / technology	Science-based manufs.
8939	Miscellaneous articles of chemicals	0.77	13.0	Rubber / Plastic products	Manufs - medium skill / technology	Scale-intensive manufs.
8942	Children's toys, indoor games	0.79	13.2	Toys / Games	Manufs - labour / resource intensive	Labour intensive manufs.
8983	Gramophone records and other sound or similar recordings	0.50	11.3	Music	Unclassified	Unclassified

[Source: Unctad, World Investment Report, 2002, p147. Factor intensity and competitiveness classifications based on Meyer, et al., 2002, Appendix III]

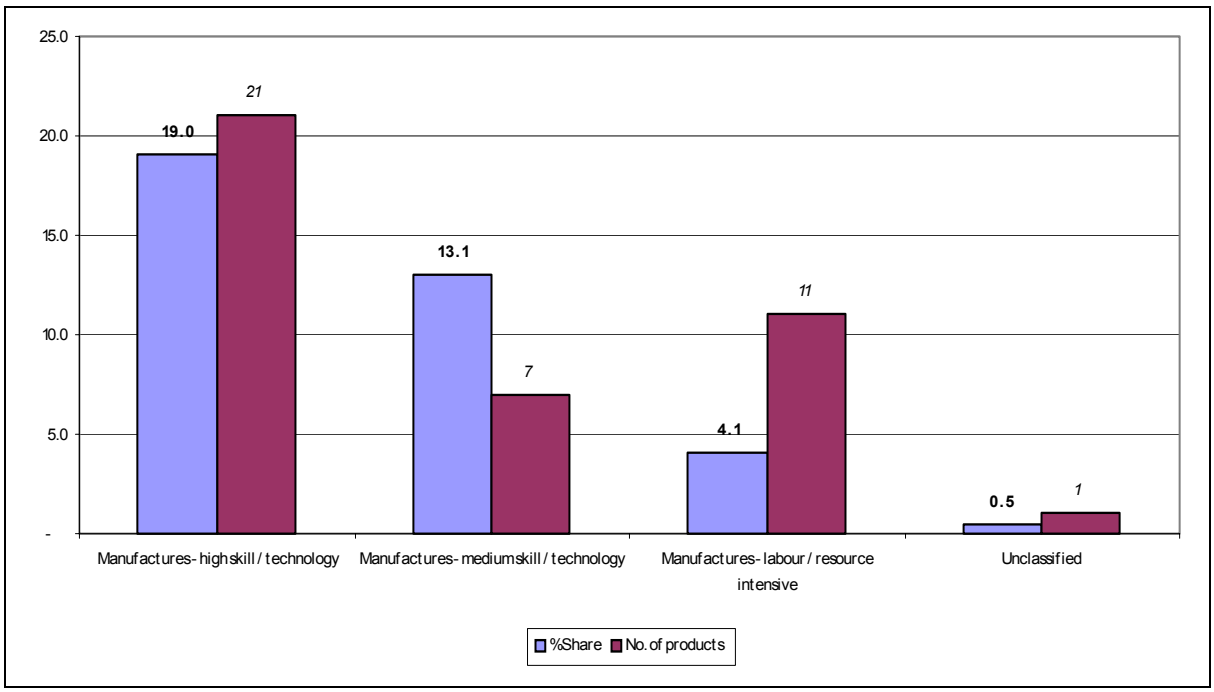
Table 6 above provides a more detailed breakdown of these dynamic products, including product classification according to:

- Industry grouping (Column E);
- Factor Intensity (Column F); and
- Main factor affecting the competitiveness process (Column G).

5.1 Top 40 dynamic products by factor intensity

Figure 4 demonstrates the breakdown of the top 40 dynamic products according to factor intensity.

Figure 4: Dynamic product market share by factor intensity, 2000



[Source: UNComtrade, own calculations]

It is notable that 39 of the 40 dynamic products are manufactures. Only music (unclassified) is not a manufactured product. No primary products appear amongst the 40 dynamic products.

In terms of factor intensity, high skill / technology manufactures are the largest product group, accounting for 21 of the 40 dynamic products, and 19 of the 37 percentage points that the 40 dynamic products hold in world market share. High skill / technology manufactures are made up of the following industry groupings: chemicals, pharmaceuticals, computers and office equipment, communications equipment, four of the seven electrical machinery products, aircraft and medical instruments. These products tend to be heavily dependent on research and development.

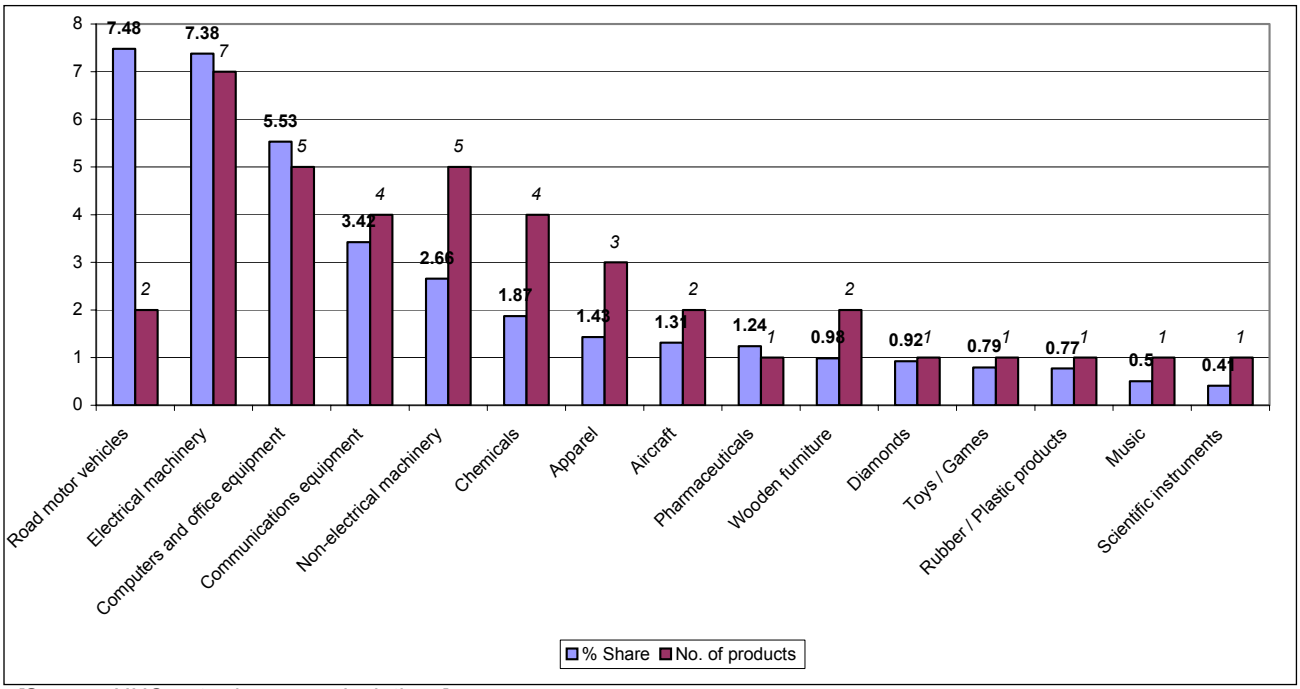
Medium skill / technology manufactures comprise seven products, but 13.1% share of dynamic products. They comprise non-electrical machinery, three of the seven electrical machinery products, road motor vehicles, and rubber / plastic products. These products tend to be characterised by scale intensity of production.

Labour- or resource-intensive manufactures comprise 11 products, but only 4.1% of world market share. They include diamonds, wooden furniture, apparel and toys / games.

5.2 Top 40 dynamic products by industry grouping and average growth

Figure 5 below portrays the top 40 dynamic products according to industry grouping, based on the world market share of these dynamic products in 2000.

Figure 5: Dynamic product market share by industry grouping, 2000



[Source: UNComtrade, own calculations]

Table 7 demonstrates weighted annual average growth rates of the industry groupings, over the period 1985-2000[11].

[11] Industry grouping growth rates have been calculated as average annual growth rates (1985-2000) weighted by 2000 market share.

Table 7: Weighted annual average growth rates of dynamic product groupings, 1985-2000

Industry Grouping	Weighted Annual Average Growth
Computers and office equipment	18.86
Communications equipment	16.76
Electrical machinery	15.70
Pharmaceuticals	14.50
Toys / Games	13.20
Rubber / Plastic products	13.00
Chemicals	12.73
Apparel	12.33
Scientific instruments	12.10
Wooden furniture	12.06
Music	11.30
Aircraft	10.94
Non-electrical machinery	10.05
Diamonds	8.90
Road motor vehicles	8.50

[Source: UNComtrade, own calculations]

The two products comprising road motor vehicles account for the largest industry grouping (7.5%). In growth terms they are at the lower end of the 40 products, registering weighted average growth of 8.5% over the 1985 to 2000 period.

The next three industry groupings collectively comprise a broader 'electro-technical' cluster: electrical machinery (seven products, 7.4% share); computers and office equipment (four products, 5.6% share); Communications equipment (four products, 3.4% share). Together they account for 16 of the 40 dynamic products and 16 of the 37 percentage points that the 40 dynamic products hold in world trade. These product groups also demonstrated amongst the highest average growth rates over the period: electrical machinery (15.7%); computers / office equipment (18.9%); and communications equipment (16.8%); well above the average growth rate of 12% for all dynamic products.

Non-electrical machinery comprises five products with a 3.4% share and an average growth of 10.1%. The chemicals grouping also consists of four products, with a 2.7% share and 12.7% growth. The three apparel products hold 1.4% share with 12.3% average growth. Aircraft comprise two products, holds a 1.3% share and experienced 10.9% growth. One pharmaceutical product accounts for 1.2% share, with the fourth-highest growth of 14.5%. Wooden furniture constitutes two products which hold 1% share and had a 12% growth rate.

The remainder of product groups each consist of one product, with shares below 1% and growth rates as follows: diamonds (8.9%); toys / games (13.2%); rubber / plastic products (13%); music (11.3%) and medical instruments (12.1%).

6 DEVELOPING COUNTRY AND SA PRESENCE IN DYNAMIC PRODUCTS

6.1 Developing-country share in dynamic products

Table 8 presents the world market share of developing countries as a group in dynamic products in world trade. Developing-country share in dynamic products is useful as a crude indicator of the barriers to entry to such countries' integration into dynamic product value chains.

Table 8: Developing-country share in dynamic products, 2000

SITC code	Products	Developing-country share 2000 (%)	Industry cluster	Factor intensity
5148	Other nitrogen-function compounds	8	Chemicals	Manufs. - high skill / technology
5156	Heterocyclic compounds; nucleic acids	8	Chemicals	Manufs. - high skill / technology
5417	Medicaments	8	Pharmaceuticals	Manufs. - high skill / technology
5839	Other polymerisation and copolymerisation products	15	Chemicals	Manufs. - high skill / technology
5989	Chemical products and preparations (n.e.s)	14	Chemicals	Manufs. - high skill / technology
6672	Diamonds (except sorted industrial diamonds), unworked, cut	24	Diamonds	Manufs. - labour / resource intensive
7132	Internal combustion piston engines for road vehicles	21	Non-electrical machinery	Manufs. - medium skill / technology
7139	Parts of the internal combustion piston engines (n.e.s)	19	Non-electrical machinery	Manufs. - medium skill / technology
7149	Parts of non-electrical engines and motors (n.e.s)	4	Non-electrical machinery	Manufs. - medium skill / technology
7284	Machinery and parts for specialized industries	16	Non-electrical machinery	Manufs. - medium skill / technology
7492	Taps, cocks, valves etc. for pipes, boiler shells, tanks, vats	20	Non-electrical machinery	Manufs. - medium skill / technology
7522	Complete digital data processing machines	70	Computers and office equipment	Manufs. - high skill / technology
7523	Complete digital central processing units	17	Computers and office equipment	Manufs. - high skill / technology
7524	Digital central storage units, separately consigned	43	Computers and office equipment	Manufs. - high skill / technology
7525	Peripheral units for data processing equipment	52	Computers and office equipment	Manufs. - high skill / technology
7599	Parts and accessories for data processing machines	54	Computers and office equipment	Manufs. - high skill / technology
7611	Television receivers, colour	72	Communications equipment	Manufs. - high skill / technology
7641	Telephonic and telegraphic apparatus	25	Communications equipment	Manufs. - high skill / technology
7643	Television, radio and related transmitters and receivers	40	Communications equipment	Manufs. - high skill / technology
7649	Parts and accessories for telecom and recording apparatus (n.e.s)	34	Communications equipment	Manufs. - high skill / technology
7712	Other electric power machinery and parts (n.e.s)	39	Electrical machinery	Manufs. - medium skill / technology
7721	Electrical apparatus for making/breaking electrical circuits	27	Electrical machinery	Manufs. - medium skill / technology
7731	Insulated electric wire, cable, bars, strip and the like	49	Electrical machinery	Manufs. - medium skill / technology
7763	Diodes, transistors and similar semiconductor devices	53	Electrical machinery	Manufs. - high skill / technology
7764	Electronic microcircuits	58	Electrical machinery	Manufs. - high skill / technology
7768	Piezo-electric crystals, parts of transistors and cathode valves (n.e.s)	30	Electrical machinery	Manufs. - high skill / technology
7788	Other electrical machinery and equipment (n.e.s)	34	Electrical machinery	Manufs. - high skill / technology
7810	Passenger motor cars	15	Road motor vehicles	Manufs. - medium skill / technology

7849	Other parts and accessories of motor vehicles (n.e.s)	15	Road motor vehicles	Manufs. - medium skill / technology
7924	Aircraft, mechanically propelled (other than helicopters)	6	Aircraft	Manufs. - high skill / technology
7929	Aircraft partsa (except tyres, engines, electrical parts)	8	Aircraft	Manufs. - high skill / technology
8211	Chairs and other seats	37	Wooden furniture	Manufs. - labour / resource intensive
8219	Other furniture and parts (n.e.s)	36	Wooden furniture	Manufs. - labour / resource intensive
8439	Other outer garments, women's, girls', infants', of textile fabrics	59	Apparel	Manufs. - labour / resource intensive
8451	Jerseys, pullovers, twin-sets, cardigans, jumpers etc.	42	Apparel	Manufs. - labour / resource intensive
8462	Under garments, knitted or crocheted, of cotton	61	Apparel	Manufs. - labour / resource intensive
8720	Medical instruments and appliances (n.e.s)	16	Scientific instruments	Manufs. - high skill / technology
8939	Miscellaneous articles of chemicals	30	Rubber / Plastic products	Manufs. - medium skill / technology
8942	Children's toys, indoor games	28	Toys / Games	Manufs. - labour / resource intensive
8983	Gramophone records and other sound or similar recordings	27	Music	Unclassified

[Source: UNComtrade, own calculations]

There are three dimensions to developing-country share as a measure of barriers to entry.

1. A very low developing-country share indicates that the product has particular characteristics which render it difficult for developing countries to integrate. For example, in the pharmaceuticals industry, the very high research and development content significantly raises the threshold for competing.
2. A higher developing-country share indicates that it has been possible for developing countries to integrate into such value chains, although often such integration is concentrated amongst a narrow group of countries.
3. A very high developing-country share indicates much lower barriers to entry. This raises the prospect of countries falling prey to the 'fallacy of composition', where simultaneous entry by a number of countries into particular products can drive down prices and hence returns.

The chemicals and pharmaceuticals products demonstrate a relatively low developing-country share (8% to 15%), reflecting the high research and technology intensity of these products.

Diamonds, somewhat of an outlier amongst the dynamic products, has a 24% developing-country share, notwithstanding the fact that diamonds emanate mostly from developing countries.

Amongst non-electrical machinery, developing-country presence varies from a low of 4% (parts of engines / motors) to a high of 21% (piston engines).

Computers and office equipment demonstrate a generally high developing-country share (43% to 70%), except for central processing units (CPUs) at 17%. This reflects the large-scale outsourcing of relatively labour-intensive components of computer production to selected developing countries. The high developed-country share in CPUs demonstrates the dominance of developed countries in controlling the core technology in the computing industry, namely the development of processors. Communications equipment also exhibits a relatively high developing-country share, ranging from 25% (telephone apparatus) to 72% (colour televisions), while electrical machinery demonstrates a reasonably high developing-country share, ranging from 27% (apparatus for making/breaking circuits) to 58% (electronic microcircuits).

Aircraft exhibit a low developing-country share (6% to 8%), reflecting the high research and development intensity, coupled with the high level of value added captured by first- and second-tier producers, mostly developed-country based companies.

The labour-intensive industry groupings – wooden furniture, apparel and toys / games have much higher levels of developing-country share, but not as high in some instances as the

traditional theory of comparative advantage would predict. Shares range from 36% to 37% for wooden furniture and 42% to 61% in apparel to 28% in toys / games. The fact that developed countries hold the balance of market share in these products (generally over 50%) probably reflects the value addition associated with control over design, branding and marketing channels for these products.

Medical instruments / appliances also exhibit low developing-country share at 16%. Rubber / plastic products have a 30% developing-country share. Music has a 27% developing country share

It should be stressed that developing-country share is used for an indicative analysis only and should not be treated as an indication of whether a country can or cannot integrate into a particular product. This requires further research at an industry or product level to establish to what extent integration is possible, based on the particular current or potential country capabilities.

6.2 SA's relative presence in dynamic products

SA's relative presence in dynamic products in world trade provides an important indicator of the manner in which SA has integrated into the global economy.

Section 6.1 and Table 8 above give a rough sense of the difficulty for developing countries of integrating into each of the 40 dynamic products. What is more important than SA's absolute ranking, however, is its presence relative to other developing economies.

Consequently, Tables 9 and 10 below provide a more detailed breakdown of country presence in terms of each of the 40 dynamic products.

A country 'dynamism' index

It was intended to establish an 'index' of country performance in terms of dynamic products. However, no single measure proved suitable for this purpose, and so three related measures were chosen, which are set out in Table 8. It demonstrates the top 50 country presence in dynamic products in three respects. First it shows the top 50 exporters of dynamic products in absolute terms. Secondly it illustrates the top 50 dynamic product exporters per capita (excluding very small developing economies). In the third place, it shows the relative 'dynamism' of countries' exports, measured by the percentage of dynamic to total exports. The figures in brackets represent the top 20 ranking of developing countries, for each measure of dynamism.

Top 50 countries: total dynamic exports

Unsurprisingly, developed countries dominate the top 20 measure of dynamic product exports in absolute terms, accounting for 13 of the top 20. Singapore is the largest developing-country exporter (overall rank 6), generating annual exports of US$85-million in dynamic products. This is followed by Mexico, Korea, China, and Taiwan in the top 11. Malaysia (16) and the Philippines (19) also feature in the top 20. From rank 20 onwards, developing countries predominate, including the remainder of the East Asian countries, a large number of eastern European transition economies, India, Turkey, three Latin American and four African economies. SA ranks 36th, just above Botswana at 37 (driven by diamonds), with US$4m in dynamic product exports in 2000. Other African economies within the top 50 countries are Morocco (47) and Tunisia (49).

Top 50 countries: dynamic exports per capita

One of the drawbacks of an absolute measure of dynamic exports is that it does not take into account relative economy size. Consequently, the second measure of country dynamism examined adjusts for population size through a ranking of dynamic exports per capita. Again, developed economies dominate the top 20, with only five developing economies present, and more dispersed. However, the top performer is again Singapore, followed by Taiwan (8), Botswana (12), Malaysia (16) and Korea (20). Singapore generated US$21 of dynamic product exports per capita in 2000. The largest single group of countries in the remainder of the ranking is former eastern European transition economies, followed by the remaining two Latin American economies (Mexico and Costa Rica), four African economies (Mauritius,

Tunisia, SA and Swaziland), two East Asian economies as well as Oman and Turkey. SA ranks 47th by this measure and generates annual dynamic exports of $0.11. This measure adversely affects the ranking of many countries with large populations, hence the absence of economies such as China, India, Brazil and Indonesia in the top 50. Conversely, it highlights smaller population economies which do not show up in the absolute ranking of dynamic exports, such as Mauritius, Oman, Namibia, Latvia and Swaziland.

Top 50 countries: 'dynamism ratio'

The final measure adopted is the ratio of dynamic exports to total exports. By this ranking, developing countries dominate the top 20, accounting for 12 of the top 20 exporters. Botswana is in the lead with 84% of exports accounted for by dynamic products (in this case diamonds). These economies are characterised by a high level of specialisation in dynamic products – 50% or more. The remainder of the top 20 are dominated by eight East Asian economies (Philippines, Singapore, Malaysia, Hungary, Mexico, Taiwan, Korea and Hong Kong), one eastern European country – Hungary – two Latin American economies (Mexico and Costa Rica), and two African economies (Namibia and Mauritius). The presence of Botswana and Namibia is attributable to the high levels of diamond exports, the only resource-based manufacture amongst the top 40 dynamic products.

Table 9: Top 50 dynamic product exporters by total dynamic product exports, per capita dynamic product exports and share of dynamic products in total exports, 2000

Rank	Country	Exports of all dynamic products, US$, 2000	Country	Dynamic products exports per capita, US$, 2000	Country	Ratio of dynamic to total exports, %, 2000
1	US	299,748,711	Singapore (1)	21.138	Botswana (1)	83.8
2	Japan	233,758,699	Ireland	13.772	Philippines (2)	73.3
3	Germany	213,444,466	Belgium	6.262	Ireland	68.5
4	UK	121,658,806	Luxembourg	4.723	Israel	64.9
5	France	118,595,114	Netherlands	3.842	Singapore (3)	61.6
6	Canada	88,851,920	Switzerland	3.429	Malaysia (4)	51.7
7	Singapore (1)	84,931,137	Sweden	3.366	Hungary (5)	51.6
8	Mexico (2)	84,442,189	Taiwan, China (2)	3.352	Mexico (6)	50.8
9	Korea, Rep.(3)	76,455,422	Israel	3.271	Taiwan, China (7)	50.0
10	China (4)	76,087,687	Finland	2.911	Japan	48.8
11	Taiwan, China (5)	74,377,355	Canada	2.889	Costa Rica (8)	45.7
12	Italy	68,511,472	Botswana (3)	2.669	Korea, Rep. (9)	44.4
13	Belgium	64,201,778	Germany	2.598	UK	44.0
14	Netherlands	61,156,658	Austria	2.306	US	42.1
15	Ireland	52,250,118	Denmark	2.282	Namibia (10)	40.9
16	Malaysia (6)	50,766,820	Malaysia (4)	2.182	Hong Kong, China (11)	40.4
17	Spain	39,942,777	UK	2.037	Mauritius (12)	39.6
18	Sweden	29,848,778	France	2.014	France	39.2
19	Philippines (7)	27,898,940	Japan	1.843	Germany	38.8
20	Switzerland	24,623,804	Korea, Rep. (5)	1.617	Sweden	38.6
21	Thailand (8)	24,033,544	Hungary (6)	1.445	Estonia (13)	37.0
22	Israel	20,389,243	Hong Kong, China (7)	1.398	Spain	35.2
23	Austria	18,698,424	Slovenia (8)	1.379	Thailand (14)	34.9
24	Finland	15,072,138	Italy	1.188	Belgium	34.7
25	Hungary (9)	14,485,443	US	1.065	Netherlands	34.0
26	Denmark	12,174,521	Estonia (9)	1.035	Slovak Republic (15)	33.3
27	India (10)	11,309,778	Spain	1.012	Finland	33.2

28	Indonesia (11)	10,455,097	Czech Rep. (10)	0.937	Czech Republic (16)	33.1
29	Poland (12)	9,677,617	Mexico (11)	0.862	Portugal	32.3
30	Czech Republic (13)	9,625,678	Portugal	0.786	Canada	32.1
31	Hong Kong, China (14)	9,502,810	Norway	0.780	Austria	31.9
32	Brazil (15)	8,531,386	Slovak Rep. (12)	0.732	Slovenia	31.4
33	Portugal	7,862,279	Costa Rica (13)	0.658	Poland (17)	30.6
34	Turkey (16)	7,661,141	Mauritius (14)	0.498	China (18)	30.5
35	Australia	6,628,910	Thailand (15)	0.396	Switzerland	30.2
36	SA (17)	4,812,094	Philippines (16)	0.369	Italy	28.5
37	Botswana (18)	4,275,512	Australia	0.346	Turkey (19)	27.9
38	Slovak Republic (19)	3,953,893	Oman (17)	0.311	Luxembourg	27.7
39	Norway	3,502,922	Namibia (18)	0.309	India (20)	25.0
40	Slovenia (20)	2,741,259	Poland (19)	0.250	Denmark	24.7
41	Russian Federation	2,728,727	New Zealand	0.192	Morocco	23.3
42	Argentina	2,636,626	Greece	0.178	Tunisia	23.0
43	Costa Rica	2,509,015	Lithuania (20)	0.178	Romania	22.6
44	Romania	2,345,148	Croatia	0.163	Jordan	20.7
45	Luxembourg	2,070,418	Tunisia	0.141	Armenia	20.3
46	Greece	1,882,534	Turkey	0.117	SA (26)	18.5
47	Morocco	1,733,937	SA (24)	0.112	Lithuania	17.3
48	Estonia	1,417,496	Latvia	0.110	Greece	17.2
49	Tunisia	1,344,247	Swaziland	0.109	Indonesia	16.8
50	Ukraine	867,759	Romania	0.105	Croatia	16.1

[Source: UNComtrade, own calculations] Note: Excludes small developing economies, i.e. countries with populations of less than one million people.

Some broad regional patterns emerge with respect to developing countries. First, East Asian economies dominate the top end of developing-country rankings in all three rankings. Secondly, there is a large presence of east European transition economies amongst the top 20 developing countries, and more broadly in the overall top 50 ranking. With the exception of Mexico, there is a limited presence amongst the top 20 developing countries, in each measure, of countries from other continents. African presence (excluding SA) occurs largely through a strong specialisation in two industries – diamonds (Botswana and Namibia) and apparel (Mauritius). SA ranks fairly low down the list according to all three measures: total dynamic product exports (17), dynamic exports per capita (24) and dynamic products ratio (26).

Country distribution of dynamic products

Table 10 gives a rough sense of the distribution of dynamic product production amongst developing countries, according to a ranking of country presence in the top 20 exports of each dynamic product. What is notable is that a number of East Asian economies, Mexico, the higher ranking eastern European transition economies, India and Turkey have quite a diversified presence in dynamic products. Other economies have a much smaller presence amongst top 20 exporters of individual products. SA is present in one product – diamonds (see Table 11 below).

Table 10: Major players in dynamic products in world trade: country presence in top 20 of dynamic products

Country	Presence in Top 20
China	37
Mexico	35
Korea, Rep.	34
Singapore	29
Taiwan, China	26
Malaysia	22
Thailand	19
Indonesia	13
Hungary	12
Poland	11
Czech Rep.	8
Hong Kong, China	8
Philippines	8
India	6
Turkey	6
Russian Fed.	3
Argentina	2
Costa Rica	2
Morocco	2
Romania	2
Slovenia	2
Belarus	1
Bolivia	1
Botswana	1
Estonia	1
Macao	1
Malta	1
Mauritius	1
Namibia	1
Pakistan	1
Peru	1
Slovak Rep.	1
SA	1
Tanzania	1
Tunisia	1
Ukraine	1

[Source: UNComtrade, own calculations]

SA's relative presence in dynamic products

While Table 9 provides a country-level snapshot of rankings *across* all 40 dynamic products and Table 10 provides a limited sense of the distribution of products by country, it is also useful to get a sense of the specific dynamic products in which countries specialise. Appendix B provides an extremely detailed breakdown of the top 31 country rankings for each dynamic product, in 2000 (as well as SA's ranking). It is beyond the scope of the current version of this paper to fully analyse regional and country presence at a product by product level. However, SA's presence in these products can be unpacked here.

Table 11 below illustrates that SA's highest ranking is in diamonds (6). This is followed by passenger motor vehicles (22) and parts (32), as well as internal combustion engines (30),

which reflect the success of government's Motor Industry Development Programme (MIDP). Chairs (22) and other wooden furniture (30) reflect downstream diversification from the forestry sector. Capabilities in aircraft (ranked 25th) stem largely from *apartheid*-era military programmes but demonstrate a base for an emerging aerospace strategy.

Table 11: SA's ranking in dynamic products, 2000

SITC	Product	Industry Grouping	SA Rank
6672	Diamonds (except sorted industrial diamonds), unworked, cut	Diamonds	6
7810	Passenger motor vehicles	Road motor vehicles	22
8211	Chairs and other seats	Wooden furniture	22
7924	Aircraft, mechanically propelled (other than helicopters)	Aircraft	25
5989	Chemical products and preparations ,n.e.s.	Chemicals	27
5156	Heterocyclic compounds; nucleic acids	Chemicals	30
7132	Internal combustion piston engines for road vehicles	Non-electrical machinery	30
7929	Aircraft parts (n.e.s) (except tyres, engines, electrical parts)	Aircraft	30
8219	Other furniture and parts	Wooden furniture	30
7849	Other parts and accessories of motor vehicles (n.e.s)	Road motor vehicles	31
5148	Other nitrogen-function compounds	Chemicals	32
7523	Complete digital central processing units	Computers and office equipment	32
7139	Parts of the internal combustion piston engines (n.e.s)	Non-electrical machinery	33
7641	Television receivers, colour	Communications equipment	33
7643	Telephonic and telegraphic apparatus	Communications equipment	34
7524	Digital central storage units, separately consigned	Computers and office equipment	35
7599	Parts and accessories for data processing machines	Computers and office equipment	35
7284	Machinery and parts for specialized industries	Non-electrical machinery	36
7522	Complete digital data processing machines	Computers and office Equipment	37
7611	Television receivers, colour	Communications equipment	37
7525	Peripheral units for data processing equipment	Computers and office Equipment	38
7763	Diodes, transistors and similar semiconductor devices	Electrical machinery	38
7649	Parts and accessories for telecom and recording apparatus (n.e.s)	Communications equipment	39
5417	Medicaments(including veterinary medicaments)	Pharmaceuticals	40
5839	Other polymerization and copolymerization products	Chemicals	40
7149	Parts of non-electrical engines and motors (n.e.s)	Non-electrical machinery	40
7492	Taps, cocks, valves etc. for pipes, tanks, vats etc	Non-electrical machinery	40
7788	Other electrical machinery and equipment (n.e.s)	Electrical machinery	41
8720	Medical instruments and appliances (n.e.s)	Medical instruments	41
7721	Electrical apparatus for making/breaking electrical circuits	Electrical machinery	43
7731	Insulated electric wire, cable, bars, strip and the like	Electrical machinery	43
7764	Electronic microcircuits	Electrical machinery	43
7768	Piezo-electric crystals, parts of transistors and cathode valves (n.e.s)	Electrical machinery	43
7712	Other electric power machinery and parts (n.e.s)	Electrical machinery	44
8983	Gramophone records and other sound or similar recordings	Music	45
8939	Miscellaneous articles of chemicals	Rubber / plastic products	46
8942	Children's toys, indoor games	Toys / Games	46
8462	Under garments, knitted or crocheted, of cotton	Apparel	47
8451	Jerseys, pullovers, twin-sets, cardigans, jumpers etc.	Apparel	63
8439	Other outer garments, women's, girls', infants', of textile fabrics	Apparel	64

Source: UNComtrade

Chemicals rank 27th, 30th, 32nd and 40th, reflecting a traditional chemicals base. In terms of the fastest-growing industry groupings (also refer to Table 7), SA ranks lower: computers and office equipment (32, 35, 37 and 38); communications equipment (33, 34, 37 and 39), electrical machinery (38 and 43-44) and pharmaceuticals (40). SA's lowest rankings are in the labour-intensive apparel products (47, 63 and 64).

7 CONCLUSIONS

7.1 Summary

The empirical evidence presented above demonstrates a number of extremely important trends which need to be taken into account in the formulation of industrial and trade policy. To reiterate, the most important of these trends are:

- Growth in world trade has outstripped growth in world income over the last two decades.
- The growth in world trade has been captured largely by a relatively small group of developing countries, largely East Asian countries, East European transition economies and Mexico. However, despite losing market share in world manufactures trade, developed countries have gained share in manufacturing income.
- There has been a rapid growth in non-resource based manufactures in relation to primary products and resource-based manufactures in world merchandise trade over this period.
- Medium- and high-technology manufactures dominate world manufactures trade, with the latter demonstrating particularly high growth (and explosive growth of ICT products as a sub-component of high-technology manufactures).
- A small group of products has demonstrated particularly high growth in world trade, accounting for almost 40% of world merchandise trade in 2000, mostly of high and medium technology. A number of distinct product clusters emerge, of which the most notable are an 'electro-technical' cluster, road motor vehicles, non-electrical machinery, chemicals and apparel.
- East Asian countries, Mexico and East European transition economies showed the most consistent presence in dynamic products by a range of measures of dynamism. This mirrors overall patterns of growth in world trade, described above.

The key driving forces behind these patterns in world trade have been:

- Trade and investment liberalisation, both at the multi-lateral and regional level.
- Broader processes of regional integration, particularly Mexico's integration into Nafta and the integration of East European transition economies with Western Europe. Notwithstanding geography, most East Asian economies appear to be more integrated with the US than with Japan.
- The growth of global income, which has driven changes in global demand towards higher value and more sophisticated and differentiated products.
- Advances in transport and logistics systems and ICTs, both of which facilitate the ability to divide and co-ordinate discrete production activities within value chains, but across countries.
- The continued immobility of unskilled labour has heightened competitive pressures, shifting relatively low-cost, labour-intensive production to selected developing countries.

These driving forces have given rise to new patterns of co-ordination of a large proportion of global production.

- TNCs, mostly based in developed countries have emerged as major co-ordinators of global production. Unctad estimates that 30% of world trade is accounted for by production that takes place under the direct or indirect control of TNC-controlled networks.
- TNC-controlled networks have given rise to an increase in vertical specialisation in world trade, that is, specialisation in different stages of value chains rather than in complete products. Typically, the knowledge-intensive parts of value chains are undertaken by in developed countries by TNCs based there, particularly research and development, design, finance, logistics and marketing (Unctad 2002b, p63).
- A large proportion of the top 40 dynamic products are produced under the auspices of TNC-controlled value chains in vertical specialisation production-sharing relationships, particularly the 'electro-technical' cluster, road motor vehicles, apparel and aircraft.
- Selected developing countries have integrated into these networks through specialisation in the relatively labour-intensive components of production. This explains the apparent paradox of high developing-country share in a number of medium- and particularly high-tech manufactures.

SA's integration into such networks, and into dynamic products in world trade more generally, has been limited.

- Aside from SA's highest ranking (diamonds), integration into TNC networks is most evident in the automotive industry, which is also amongst SA's highest rankings. This is largely attributable to the MIDP programme.
- This is followed by a relatively high presence in wooden furniture products.
- There is also a substantial presence in aircraft, presumably on the back of SA's military capabilities in this industry. SA's emerging aerospace strategy (NACI, 2003) should boost this presence, particularly in the commercial side of this industry.
- The major apparent gap in SA's presence in dynamic products emerges with respect to the 'electro-technical' cluster of products.

7.2 Policy implications and further research

Some tentative policy implications emerge from the analysis above, as well as areas for more in-depth research.

- There is a need to examine SA's industrial structure systematically in terms of the industry groups and specific products which have demonstrated such sustained growth in world trade, with a view to establishing ways in which to increase growth in these products.
- In particular, ways in which SA can increase integration into the 'electro-technical' cluster of products should be examined. Given the predominance of TNCs in controlling production in these and other dynamic products, the identification of the major players and an understanding of their investment decision criteria are fundamental to such an analysis. This also implies a need for more targeted investment promotion activities, aimed at specific key TNC firms.
- More broadly, the analysis reveals an important gap in debates around SA's industrialisation. Typically these debates have been dominated by the implicit idea that SA's industrial development should proceed in a linear manner from its resource base through successively increasing levels of value addition of resources (see, for example, Fine and Rustomjee, 1996).
- Integration into TNC-controlled networks in products unrelated to a country's inherited resource endowments is one avenue for industrial development (although it does not exclude resource-based or other routes to development). This has already occurred in terms of SA's automotive sector[12]. Vertical specialisation poses opportunities and challenges for developing countries. A major opportunity arises because it is no longer necessary for developing-country firms to master the entire scope of production of a particular product. So it can specialise in one area of production in which it offers a competitive mix of costs and capabilities. The initial challenge is competition from firms in other countries that are simultaneously developing these capabilities, while a longer term challenge relates to the development of the domestic technological base and a reduction in dependence on foreign technologies.
- The examination of the possibilities for greater integration into dynamic products should be seen as only one component of industrial strategy. Other areas not highlighted by this analysis include:
  - Other products which have shown higher than average growth in world trade. A number of agricultural products have shown high growth in world trade, of which some are high-value products (Unctad 2002b, p61). These are particularly relevant in the context of employment generation.
  - Services in world trade. There has been substantial growth in particular types of services in world trade, which is less well captured due to data limitations. Many of the factors driving outsourcing in manufacturing are also occurring in service sectors, hence, for example, the growth in business process outsourcing.

[12] The fact that SA has a vibrant automotive industry stems more from policy choice than resource base, although there are strong linkages with the resource base in some areas, particularly catalytic converters, which require significant amounts of platinum and stainless steel, and leather car-seat covers.

REFERENCES

Fine, B. and Z. Rustomjee (1996) The Political Economy of SA: From Minerals-Energy Complex to Industrialization, Westview

Hummels D, Rapoport D and Yi KM (1998). Vertical specialization and the changing nature of world trade. *Economic Policy Review*. New York, Federal Reserve Bank, June: 79–99.

Kaplinsky, R. and M. Morris (2001), *Handbook for Value Chain Research*, http://www.ids.ac.uk/global/valchn.html

Mayer, J., Butkevicius, A and A. Kadri, (2002) "Dynamic Products in World Exports", UNCTAD Discussion Paper No. 159

National Advisory Council on Innovation (NACI), (2003) "ASSEGAI: A Strategy for a Sustainable, Economical and Growing Aerospace Industry -- An Advanced Manufacturing and Logistics Technology Strategy", Draft Discussion Document

Nolan, P., (2001) *China and the Global Economy – National Champions, Industrial Policy and the Big Business Revolution, Part 2*, mimeo

Pritchett, L., (1996) "Measuring Outward Orientation in LDCs: Can It Be Done?" *Journal of Development Economics.*

Spar, D., (1998) "Attracting High Technology Investment: Intel's Costa Rican Plant", International Finance Corporation / World Bank

United Nations Conference on Trade and Development, 2002a. *World Investment Report: Transnational Corporations and Export Competitiveness*. New York and Geneva

_____ 2002b. *Trade and Development Report*, New York and Geneva

United Nations Industrial Development Organisation, 2002, *Industrial Development Report 2002/3: Competing through innovation and learning*, Vienna

APPENDICES

Appendix A: Top 10 export destinations – selected developing economies, 2000

North America

MEXICO			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*179,114,900*	*100.0%*
USA	1	152,919,900	85.4%
Canada	2	8,107,728	4.5%
Spain	3	1,613,873	0.9%
Germany	4	1,253,346	0.7%
Japan	5	1,054,373	0.6%
Netherland Antilles	6	996,603	0.6%
UK	7	891,796	0.5%
Brazil	8	810,293	0.5%
Venezuela	9	679,921	0.4%
Chile	10	637,690	0.4%
Cumulative Share			*94.3%*

East Asia

CHINA			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*270,573,500*	*100.0%*
USA	1	59,831,210	22.1%
Hong Kong	2	51,515,960	19.0%
Japan	3	44,676,050	16.5%
Korea Republic	4	11,860,950	4.4%
Germany	5	11,631,040	4.3%
UK	6	6,510,575	2.4%
Netherlands	7	5,902,034	2.2%
Singapore	8	5,843,282	2.2%
France	9	5,599,228	2.1%
Taiwan	10	5,312,552	2.0%
Cumulative Share			*77.1%*

HONG KONG			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*206,331,800*	*100.0%*
China	1	69,376,370	33.6%
USA	2	47,485,010	23.0%
Japan	3	11,143,790	5.4%
UK	4	9,695,470	4.7%
Germany	5	7,334,093	3.6%
Taiwan	6	5,594,651	2.7%
Singapore	7	5,223,749	2.5%
Korea Republic	8	3,761,462	1.8%
Canada	9	3,354,031	1.6%
France	10	3,294,333	1.6%
Cumulative Share			*80.6%*

INDONESIA			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*65,528,960*	*100.0%*
Japan	1	15,968,960	24.4%
USA	2	9,263,635	14.1%
Korea Republic	3	4,895,844	7.5%
Singapore	4	4,090,735	6.2%
China	5	3,807,730	5.8%
Taiwan	6	2,507,645	3.8%
Malaysia	7	2,501,442	3.8%
Germany	8	1,885,151	2.9%
Australia	9	1,672,772	2.6%
Hong Kong	10	1,650,572	2.5%
Cumulative Share			*73.6%*

KOREA REPUBLIC			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*181,702,200*	*100.0%*
USA	1	40,706,680	22.4%
China	2	22,428,720	12.3%
Japan	3	21,174,270	11.7%
Hong Kong	4	10,757,210	5.9%
Taiwan	5	8,462,342	4.7%
Germany	6	5,581,105	3.1%
Singapore	7	5,510,025	3.0%
UK	8	5,445,676	3.0%
Malaysia	9	3,619,394	2.0%
Mexico	10	3,009,266	1.7%
Cumulative Share			*69.7%*

MALAYSIA			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*104,436,300*	*100.0%*
USA	1	21,886,130	21.0%
Singapore	2	19,384,150	18.6%
Japan	3	13,194,760	12.6%
Hong Kong	4	4,766,386	4.6%
Korea Republic	5	4,234,479	4.1%
China	6	4,029,098	3.9%
Taiwan	7	3,936,573	3.8%
Thailand	8	3,605,437	3.5%
UK	9	3,365,937	3.2%
Germany	10	3,253,877	3.1%
Cumulative Share			*78.2%*

PHILIPPINES			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*40,506,290*	*100.0%*
USA	1	12,264,170	30.3%
Japan	2	6,120,085	15.1%
Singapore	3	3,223,268	8.0%
Taiwan	4	3,016,580	7.4%
Netherlands	5	2,795,893	6.9%
Hong Kong	6	1,691,478	4.2%
Malaysia	7	1,648,917	4.1%
Germany	8	1,480,613	3.7%
UK	9	1,463,046	3.6%
Korea Republic	10	1,332,460	3.3%
Cumulative Share			*86.5%*

SINGAPORE			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*138,698,900*	*100.0%*
USA	1	24,616,550	17.7%
Malaysia	2	22,712,710	16.4%
Hong Kong	3	10,916,930	7.9%
Japan	4	10,024,580	7.2%
Taiwan	5	8,671,918	6.3%
China	6	6,115,524	4.4%
Thailand	7	5,637,370	4.1%
Korea Republic	8	5,095,035	3.7%
Germany	9	4,275,670	3.1%
UK	10	3,693,632	2.7%
Cumulative Share			*73.4%*

TAIWAN			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*167,214,000*	*100.0%*
USA	1	42,260,530	25.3%
China	2	25,493,510	15.2%
Japan	3	17,900,290	10.7%
Hong Kong	4	15,936,220	9.5%
Germany	5	6,601,663	3.9%
Singapore	6	5,966,669	3.6%
UK	7	5,569,930	3.3%
Korea Republic	8	4,700,709	2.8%
Malaysia	9	4,608,226	2.8%
Netherlands	10	3,561,091	2.1%
Cumulative Share			*79.3%*

THAILAND			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*72,764,820*	*100.0%*
USA	1	15,759,240	21.7%
Japan	2	10,139,950	13.9%
Singapore	3	6,221,648	8.6%
China	4	3,815,780	5.2%
Hong Kong	5	3,652,035	5.0%
Malaysia	6	3,109,030	4.3%
Taiwan	7	2,542,185	3.5%
UK	8	2,355,057	3.2%
Germany	9	2,136,305	2.9%
Netherlands	10	1,885,003	2.6%
Cumulative Share			*70.9%*

Eastern Europe

TURKEY			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*29,134,650*	*100.0%*
Germany	1	5,734,877	19.7%
USA	2	3,328,203	11.4%
UK	3	2,289,446	7.9%
France	4	2,050,167	7.0%
Italy	5	2,048,663	7.0%
Netherlands	6	966,855	3.3%
Spain	7	846,919	2.9%
Belgium-Luxemburg	8	789,526	2.7%
Areas NES	9	656,291	2.3%
Russia	10	463,932	1.6%
Cumulative Share			*65.8%*

CZECH REPUBLIC			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*30,849,300*	*100.0%*
Germany	1	12,576,080	40.8%
Former Czechoslovakia	2	2,146,077	7.0%
Slovakia	3	2,146,077	7.0%
Austria	4	1,752,577	5.7%
Poland	5	1,630,735	5.3%
UK	6	1,339,371	4.3%
France	7	1,267,684	4.1%
Italy	8	1,123,178	3.6%
USA	9	907,881	2.9%
Belgium-Luxemburg	10	685,200	2.2%
Cumulative Share			*82.9%*

HUNGARY			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*29,889,130*	*100.0%*
Germany	1	10,696,210	35.8%
Austria	2	2,382,874	8.0%
France	3	2,035,999	6.8%
Italy	4	1,755,263	5.9%
USA	5	1,668,524	5.6%
Netherlands	6	1,402,615	4.7%
UK	7	1,175,532	3.9%
Belgium-Luxemburg	8	978,685	3.3%
Former Yugoslavia	9	889,452	3.0%
Former Czechoslovakia	10	838,853	2.8%
Cumulative Share			*79.7%*

POLAND			
Major Export Markets	**Rank**	**Value**	**Share**
Total Exports		*33,384,050*	*100.0%*
Germany	1	11,523,700	34.5%
Italy	2	2,111,496	6.3%
France	3	1,847,089	5.5%
Former Czechoslovakia	4	1,628,178	4.9%
UK	5	1,530,463	4.6%
Netherlands	6	1,483,372	4.4%
Czech Republic	7	1,215,313	3.6%
USA	8	1,099,114	3.3%
Belgium-Luxemburg	9	1,037,774	3.1%
Sweden	10	990,302	3.0%
Cumulative Share			*73.3%*

[Source: World Trade Database]

Appendix B: Country rankings – 40 dynamic products, 2000

SITC Product	5148 Other nitrogen-function compounds		5156 Heterocyclic compounds;nucleic acids		5417 Medicaments(including veterinary medicaments)		5839 Other polymerization and copolimerization products		5989 Chemical products and preparations,n.e.s.	
Industry Grouping	Chemicals		Chemicals		Pharmaceuticals		Chemicals		Chemicals	
Rank										
1	Ireland	7,494,713	Ireland	6,455,302	United Kingdom	9,153,233	Germany	5,259,053	United States	7,053,989
2	United States	7,494,713	Germany	6,455,302	Germany	9,153,233	United States	5,259,053	Germany	7,053,989
3	Belgium	2,363,218	France	2,620,126	France	8,843,475	Belgium	4,265,764	Japan	5,938,301
4	Japan	2,078,737	United States	2,587,607	United States	8,259,041	Japan	2,615,340	United Kingdom	4,585,671
5	Germany	1,651,285	Japan	1,742,267	Switzerland	7,031,853	France	2,244,576	France	2,302,913
6	France	1,318,519	Switzerland	1,590,698	Italy	7,027,069	Netherlands	1,613,091	Netherlands	1,974,351
7	Switzerland	1,201,815	United Kingdom	1,514,606	Belgium	5,183,556	Italy	1,283,808	Italy	1,592,327
8	United Kingdom	1,101,671	Belgium	1,492,829	Ireland	4,652,996	Canada	1,146,790	Ireland	1,433,527
9	Netherlands	930,746	Italy	1,333,994	Sweden	3,726,937	Korea, Rep.	901,512	Belgium	1,419,691
10	Italy	621,461	Netherlands	580,651	Netherlands	3,708,775	United Kingdom	768,137	Taiwan, China	1,356,484
11	Singapore	577,609	China	538,317	Denmark	3,225,454	Taiwan, China	759,935	Singapore	764,543
12	Korea, Rep.	411,549	Singapore	465,329	Japan	2,122,046	Spain	624,643	Israel	675,047
13	China	394,597	Spain	396,875	Spain	1,665,683	Austria	397,733	Switzerland	649,578
14	Spain	330,683	Austria	318,260	Australia	1,390,736	Switzerland	333,837	Korea, Rep.	644,636
15	Brazil	219,844	Denmark	285,621	Austria	937,440	Singapore	332,850	Canada	551,385
16	Israel	115,185	Russian Fed.	221,541	India	930,845	Mexico	313,203	Malaysia	520,752
17	Belarus	103,510	Korea, Rep.	205,693	Canada	878,035	Finland	308,121	China	502,107
18	Romania	99,321	Israel	135,269	Mexico	872,554	Sweden	229,746	Spain	421,143
19	Hungary	81,724	Poland	125,233	Israel	549,189	China	209,014	Sweden	407,569
20	Mexico	66,018	India	116,591	Slovenia	379,038	Malaysia	205,977	Austria	398,050
21	Taiwan, China	64,585	Mexico	108,169	Hungary	378,712	Thailand	162,174	Norway	283,402
22	Indonesia	64,036	Czech Rep.	74,397	China	294,687	Denmark	154,891	Mexico	268,244
23	Russian Fed.	60,954	Sweden	59,792	Singapore	273,725	Saudi Arabia	134,688	Finland	219,533
24	Finland	57,681	Thailand	48,388	Argentina	249,202	Russian Fed.	93,760	Denmark	185,987
25	Poland	57,505	Brazil	47,041	Greece	241,373	Hungary	88,797	India	165,226
26	India	48,960	Canada	46,621	Portugal	236,063	Ireland	88,143	Brazil	151,127
27	Argentina	48,710	Slovak Rep.	46,555	Colombia	191,528	Indonesia	84,228	South Africa	110,823
28	Czech Rep.	47,703	Hungary	43,126	Finland	190,716	Brazil	72,555	Russian Fed.	106,491
29	Austria	46,075	Taiwan, China	39,314	Brazil	168,595	India	70,887	Australia	105,383
30	Sweden	38,873	South Africa	20,093	Norway	152,916	Poland	68,308	Indonesia	98,045
31	Canada	38,715	Indonesia	18,434	Costa Rica	149,161	Israel	66,528	Portugal	94,046
SA Rank	32		30		40		40		27	

SITC		6672		7132		7139		7149		7284
Product	Diamonds (except sorted industrial diamonds), unworked, cut		Internal combustion piston engines for road vehicles		Parts of the internal combustion piston engines (n.e.s)		Parts of non-electrical engines and motors (n.e.s)		Machinery and parts for specialized industries	
Industry Grouping	Dimonds		Non-electrical machinery		Non-electrical machinery		Non-electrical machinery		Non-electrical machinery	
Rank										
1	Belgium	12,950,459	United States	7,239,497	Japan	4,742,731	United States	9,025,107	Japan	14,210,458
2	Israel	12,950,459	Japan	7,239,497	Germany	4,742,731	United Kingdom	9,025,107	United States	14,210,458
3	United Kingdom	9,562,845	Germany	4,269,918	United States	4,361,994	France	4,782,947	Germany	13,686,820
4	India	6,513,603	Canada	3,678,779	Mexico	4,207,209	Germany	3,289,845	Italy	7,820,921
5	Botswana	6,278,889	Hungary	2,773,550	Canada	1,382,556	Japan	2,084,224	Switzerland	4,802,209
6	South Africa	4,175,818	France	2,336,822	France	1,259,042	Canada	1,255,433	France	2,490,920
7	United States	1,750,583	Mexico	2,183,818	United Kingdom	1,221,284	Netherlands	1,105,057	Singapore	1,799,449
8	Switzerland	1,289,127	Austria	2,140,916	Italy	1,017,083	Italy	1,062,272	United Kingdom	1,680,649
9	China	971,572	United Kingdom	2,010,281	Brazil	984,238	Switzerland	1,049,687	Canada	1,564,293
10	Namibia	541,063	Poland	1,960,873	Austria	771,878	Sweden	754,243	Korea, Rep.	1,383,166
11	Canada	515,459	Spain	1,086,287	Spain	478,246	Belgium	560,575	Taiwan, China	1,375,873
12	Thailand	393,053	Italy	1,013,823	Belgium	441,362	Mexico	388,851	Netherlands	1,262,151
13	Singapore	328,428	Brazil	689,293	Netherlands	388,555	Norway	224,419	Austria	1,255,628
14	France	176,358	Sweden	307,325	China	329,443	Korea, Rep.	191,007	Sweden	966,204
15	Germany	100,214	Australia	303,124	Hungary	239,542	Russian Fed.	138,102	Finland	784,113
16	Australia	74,123	Thailand	263,830	Turkey	237,773	Ireland	106,154	Belgium	503,565
17	Portugal	49,023	Argentina	157,186	Sweden	227,940	China	92,446	Mexico	492,164
18	Tanzania	44,010	Belgium	120,222	Singapore	212,140	Israel	92,268	Spain	409,309
19	Mauritius	40,851	Korea, Rep.	105,518	Korea, Rep.	179,828	Spain	84,362	Malaysia	381,277
20	Hong Kong, Chir	34,907	Netherlands	83,253	Poland	165,756	Poland	79,814	China	366,981
21	Malaysia	32,294	China	79,357	Finland	161,774	Singapore	75,472	Denmark	356,298
22	Armenia	29,443	Czech Rep.	66,914	Czech Rep.	155,869	Malaysia	62,548	Australia	279,831
23	Belarus	21,194	Russian Fed.	66,000	Portugal	152,649	Turkey	62,263	Israel	217,828
24	Italy	20,440	Belarus	60,709	Denmark	141,756	Taiwan, China	58,692	Czech Rep.	212,529
25	Netherlands	19,777	Romania	42,490	Switzerland	138,501	Austria	42,856	Philippines	196,033
26	Brazil	12,892	Indonesia	39,948	India	127,970	Brazil	42,212	Norway	178,030
27	Ireland	10,900	Taiwan, China	35,844	Thailand	109,279	Denmark	32,285	Ireland	177,174
28	Spain	4,521	Turkey	23,529	Norway	105,134	Hungary	29,502	Russian Fed.	154,968
29	Mexico	4,408	Singapore	22,381	Australia	95,545	Slovak Rep.	26,908	India	152,887
30	Tunisia	3,824	South Africa	14,545	Argentina	95,454	Czech Rep.	23,918	Hungary	133,431
31	Austria	3,776	Slovak Rep.	10,742	Taiwan, China	83,010	Thailand	20,472	Poland	112,253
SA Rank		6		30		33		40		36

SITC Product	7492 Taps,cocks,valves etc.for pipes,tanks,vats etc		7522 Complete digital data processing machines		7523 Complete digital central processing units		7524 Digital central storage units,separately consigned		7525 Peripheral units for data processing equipment	
Industry Grouping	Non-electrical machinery		Computers and office Equipment		Computers and office Equipment		Computers and office Equipment		Computers and office Equipment	
Rank										
1	Germany	3,375,722	Taiwan, China	12,188,475	United States	8,161,240	Singapore	12,641,651	China	6,315,490
2	United States	3,375,722	Japan	12,188,475	United Kingdom	8,161,240	Netherlands	12,641,651	Japan	6,315,490
3	Italy	3,284,359	Mexico	2,775,858	Ireland	6,151,151	Japan	4,613,891	Netherlands	5,887,381
4	Japan	3,049,621	United States	2,758,142	Netherlands	3,570,250	Malaysia	4,096,849	Korea, Rep.	5,015,868
5	Mexico	2,006,655	United Kingdom	2,364,193	Germany	3,489,506	Ireland	3,585,351	Philippines	4,131,826
6	France	1,273,528	Ireland	2,136,983	France	2,708,510	China	3,417,144	Singapore	3,966,598
7	United Kingdom	1,270,959	Germany	2,003,160	Korea, Rep.	2,408,447	United States	2,559,605	Mexico	3,570,099
8	China	1,037,404	Netherlands	2,001,673	Singapore	2,153,477	Korea, Rep.	2,517,016	Taiwan, China	3,116,867
9	Switzerland	811,502	China	1,519,105	Japan	2,020,204	United Kingdom	2,267,551	Germany	2,877,970
10	Canada	617,496	Malaysia	906,223	Indonesia	1,738,185	Germany	2,212,913	United States	2,447,757
11	Taiwan, China	589,110	Korea, Rep.	884,980	Mexico	794,830	Hungary	2,018,587	United Kingdom	2,209,667
12	Spain	567,785	France	717,081	Switzerland	591,188	Belgium	1,662,012	France	2,189,513
13	Denmark	488,944	Belgium	691,248	China	532,909	Taiwan, China	901,757	Thailand	2,134,085
14	Netherlands	473,529	Singapore	402,387	Canada	516,474	France	727,226	Malaysia	1,405,768
15	Korea, Rep.	420,961	Canada	393,250	Belgium	444,323	Mexico	658,544	Belgium	1,131,542
16	Belgium	310,414	Austria	243,198	Italy	279,154	Italy	635,043	Indonesia	1,122,677
17	Austria	297,451	Sweden	105,942	Brazil	273,110	Canada	163,148	Spain	1,031,198
18	Sweden	296,484	Italy	78,726	Taiwan, China	204,021	Austria	139,588	Hungary	985,936
19	Russian Fed.	288,024	Indonesia	66,980	Finland	195,650	Denmark	106,523	Canada	670,577
20	Finland	179,434	Czech Rep.	62,613	Malaysia	168,132	Spain	98,075	Ireland	293,136
21	Singapore	158,038	Luxembourg	52,822	Denmark	94,535	Norway	97,827	Italy	242,912
22	Czech Rep.	149,666	Denmark	52,230	Sweden	89,880	Sweden	89,544	Sweden	240,231
23	Luxembourg	142,000	Philippines	50,106	Spain	85,218	Switzerland	61,235	Austria	105,823
24	Portugal	117,694	Finland	49,788	Australia	76,793	Finland	50,027	Brazil	100,947
25	Poland	110,431	Spain	41,484	Austria	66,893	Luxembourg	26,079	Norway	88,399
26	Thailand	110,001	Switzerland	33,341	Czech Rep.	52,273	Czech Rep.	25,736	Denmark	78,725
27	Norway	102,942	Thailand	28,562	Norway	45,643	Poland	19,110	Slovak Rep.	78,580
28	Hungary	94,798	Australia	21,363	Russian Fed.	43,348	Brazil	18,539	Finland	62,536
29	Israel	87,146	Poland	18,265	Hong Kong, Chir	21,495	India	14,177	Switzerland	55,733
30	Ireland	81,048	Norway	14,163	Malta	17,672	Argentina	10,957	Czech Rep.	55,174
31	India	78,987	Brazil	10,186	Poland	14,247	Australia	10,708	Turkey	39,564
SA Rank		40		37		32		35		38

SITC Product	7599 Parts and accessories for data processing machines		7611 Television receivers,colour		7641 Television receivers, colour		7643 Telephonic and telegraphic apparatus		7649 Parts and accessories for telecom and recording apparatus (n.e.s)	
Industry Grouping	Computers and office Equipment		Communications equipment		Communications equipment		Communications equipment		Communications equipment	
Rank										
1	United States	19,724,691	Mexico	5,727,434	United Kingdom	6,087,934	Germany	7,334,467	United States	10,944,222
2	Malaysia	19,724,691	Japan	5,727,434	United States	6,087,934	United Kingdom	7,334,467	Japan	10,944,222
3	Japan	13,169,309	Malaysia	3,264,955	Canada	5,599,600	United States	6,282,473	China	9,971,255
4	Taiwan, China	12,984,384	Korea, Rep.	2,007,572	Sweden	4,792,541	France	6,249,134	Canada	5,457,000
5	Singapore	12,217,931	France	1,515,320	Netherlands	3,930,927	Korea, Rep.	5,938,969	Sweden	4,347,030
6	Korea, Rep.	10,831,662	United Kingdom	1,416,508	Mexico	2,825,215	Finland	5,672,703	Germany	3,815,612
7	Ireland	9,960,036	China	1,327,785	China	2,673,875	Sweden	5,130,945	Korea, Rep.	3,748,023
8	Thailand	7,770,747	Thailand	1,118,481	France	2,634,381	Mexico	3,686,512	Mexico	3,383,673
9	Netherlands	6,447,681	Spain	1,091,953	Finland	2,549,191	China	3,679,301	Singapore	3,070,869
10	United Kingdom	6,171,010	Netherlands	936,762	Taiwan, China	2,454,427	Japan	2,933,644	United Kingdom	2,955,891
11	China	6,046,380	United States	862,596	Germany	2,238,695	Malaysia	2,055,806	France	2,873,689
12	Germany	5,639,032	Turkey	830,040	Japan	2,135,750	Singapore	1,904,570	Israel	2,820,519
13	Mexico	5,299,657	Taiwan, China	830,002	Ireland	1,998,708	Canada	1,887,766	Taiwan, China	2,554,422
14	Canada	3,223,366	Belgium	783,391	Malaysia	1,828,363	Brazil	1,854,350	Finland	2,167,175
15	France	3,069,306	Germany	754,454	Italy	1,361,783	Denmark	986,278	Italy	2,064,971
16	Philippines	2,973,602	Poland	689,095	Israel	952,064	Hungary	907,536	Belgium	2,052,723
17	Italy	2,501,446	Singapore	635,114	Thailand	941,610	Estonia	707,569	Malaysia	1,906,901
18	Costa Rica	1,884,855	Hungary	573,729	Singapore	803,880	Netherlands	668,732	Netherlands	1,906,493
19	Hungary	1,627,087	Indonesia	428,480	Belgium	653,987	Italy	595,204	Indonesia	1,475,632
20	Indonesia	1,500,231	Czech Rep.	313,997	Korea, Rep.	591,120	Israel	545,865	Ireland	1,320,792
21	Belgium	992,958	Sweden	226,783	Australia	507,987	Luxembourg	465,831	Thailand	1,023,090
22	Australia	848,533	Denmark	224,231	Spain	399,808	Taiwan, China	426,682	Spain	996,054
23	Hong Kong, Chir	554,254	Austria	200,085	Austria	392,975	Philippines	409,822	Hungary	696,127
24	Denmark	545,532	Italy	186,594	Switzerland	372,110	Belgium	403,279	Hong Kong, Chir	599,535
25	Switzerland	505,299	Brazil	167,464	Indonesia	218,376	Spain	359,144	Philippines	502,855
26	Austria	477,898	Portugal	155,904	Denmark	183,765	Austria	318,051	Denmark	450,929
27	Spain	408,023	Ireland	144,702	Norway	174,200	Ireland	213,688	Switzerland	434,603
28	Israel	401,664	Philippines	112,933	Philippines	125,246	Norway	208,958	Austria	333,586
29	Czech Rep.	310,612	Slovak Rep.	76,855	Romania	119,577	Switzerland	195,872	Australia	327,644
30	Sweden	261,350	Slovenia	67,404	Hungary	103,978	Thailand	193,608	Estonia	272,093
31	India	195,936	Belarus	48,659	Slovenia	59,867	Czech Rep.	160,250	Norway	251,651
SA Rank		35		37		33		34		39

SITC Product	7768 Piezo-electric crystals, parts of transistors and cathode valves (n.e.s)		7788 Other electrical machinery and equipment (n.e.s)		7810 Passenger motor vehicles		7849 Other parts and accessories of motor vehicles (n.e.s)		7924 Aircraft, mechanically propelled (other than helicopters)	
Industry Grouping	Electrical machinery		Electrical machinery		Road motor vehicles		Road motor vehicles		Aircraft	
Rank										
1	Japan	6,795,823	Japan	12,449,086	Germany	60,541,878	United States	29,864,466	United States	21,031,249
2	Singapore	6,795,823	United States	12,449,086	Japan	60,541,878	Japan	29,864,466	France	21,031,249
3	United States	3,923,080	Germany	7,889,874	Canada	56,809,394	Germany	17,211,631	Germany	11,322,384
4	Malaysia	2,540,910	United Kingdom	4,690,357	France	34,909,680	France	15,154,766	Italy	11,291,359
5	Korea, Rep.	1,308,380	Mexico	3,652,902	Spain	19,388,349	Canada	12,268,750	Canada	2,206,041
6	China	1,070,518	Singapore	3,446,336	Belgium	17,310,430	United Kingdom	10,544,207	Brazil	1,157,514
7	Germany	877,923	Taiwan, China	2,713,641	Mexico	16,354,409	Italy	7,176,504	Turkey	635,632
8	Thailand	837,796	China	2,589,470	United States	16,296,730	Mexico	6,817,997	United Kingdom	575,727
9	Philippines	734,854	France	2,321,899	United Kingdom	15,694,489	Spain	5,791,024	Korea, Rep.	555,248
10	United Kingdom	654,004	Netherlands	1,390,336	Korea, Rep.	14,042,851	Belgium	5,738,832	Spain	428,828
11	Taiwan, China	469,968	Korea, Rep.	1,120,050	Italy	11,894,076	Sweden	3,201,744	Argentina	329,126
12	Netherlands	390,253	Malaysia	969,044	Netherlands	7,252,398	Austria	2,685,083	Denmark	223,593
13	Hong Kong, Chir	350,564	Italy	955,888	Austria	3,861,067	Korea, Rep.	1,874,928	Portugal	216,146
14	Mexico	182,283	Canada	955,315	Czech Rep.	2,694,253	Taiwan, China	1,745,768	Bolivia	168,130
15	France	179,511	Thailand	887,631	Portugal	2,459,439	Czech Rep.	1,707,005	China	140,500
16	Indonesia	165,491	Czech Rep.	666,707	Slovak Rep.	2,224,421	Netherlands	1,524,085	Singapore	129,238
17	Switzerland	157,498	Ireland	660,389	Sweden	1,937,547	Brazil	1,221,444	Malaysia	119,287
18	Canada	128,193	Israel	616,425	Brazil	1,861,257	China	1,207,809	Switzerland	101,685
19	Italy	102,718	Switzerland	594,310	Poland	1,768,453	Poland	1,120,914	Greece	100,335
20	Australia	72,617	Austria	551,849	Hungary	1,460,993	Hungary	749,155	Ukraine	89,855
21	Ireland	69,105	Sweden	485,039	Australia	1,423,643	Portugal	730,296	Poland	86,602
22	Brazil	51,988	Belgium	467,589	South Africa	1,310,099	Philippines	580,457	Ireland	85,000
23	Slovak Rep.	51,298	Spain	398,197	Slovenia	1,041,603	Argentina	568,389	Sweden	77,828
24	Israel	50,051	Hungary	392,187	Finland	746,412	Thailand	512,042	Finland	70,751
25	Belgium	42,404	Portugal	321,572	Argentina	742,519	Australia	503,691	South Africa	63,907
26	Austria	40,171	Finland	299,650	Turkey	730,293	Singapore	472,166	Austria	57,149
27	Czech Rep.	29,636	Denmark	260,062	Oman	628,454	Switzerland	456,044	Mexico	49,790
28	Poland	23,235	Indonesia	178,930	Russian Fed.	364,981	Turkey	450,812	Australia	47,817
29	Sweden	21,861	Australia	176,938	Denmark	349,301	Slovak Rep.	449,838	Norway	28,330
30	Lithuania	21,260	Ukraine	159,289	Ireland	288,905	Denmark	429,702	Kazakhstan	20,730
31	Denmark	20,544	India	156,189	Thailand	282,303	South Africa	414,566	Slovak Rep.	16,029
SA Rank	43		41		22		31		25	

SITC		7929		8211		8219		8439		8451
Product	Aircraft parts (n.e.s) (except tyres, engines, electrical parts)		Chairs and other seats		Other furniture and parts		Other outer garments, women's, girls', infants', of textile fabrics		Jerseys, pullovers, twin-sets, cardigans, jumpers etc.	
Industry Grouping	Aircraft		Wooden furniture		Wooden furniture		Apparel		Apparel	
Rank										
1	United States	14,680,049	Italy	3,497,884	Italy	4,823,996	China	4,424,852	China	4,698,927
2	United Kingdom	14,680,049	United States	3,497,884	Canada	4,823,996	Italy	4,424,852	Italy	4,698,927
3	Germany	8,250,047	Mexico	2,591,959	Germany	3,509,183	Mexico	2,244,295	Hong Kong, Chir	2,819,830
4	France	3,261,095	Germany	2,368,699	China	2,723,870	Hong Kong, Chir	2,035,592	Turkey	2,118,916
5	Canada	2,587,809	Canada	1,804,229	United States	2,157,148	France	1,472,863	Germany	887,076
6	Japan	1,636,562	China	1,594,028	Denmark	1,993,961	Germany	1,327,717	United States	836,991
7	Spain	1,484,480	Poland	1,408,035	France	1,442,264	Turkey	1,005,222	Korea, Rep.	615,447
8	Israel	932,889	France	1,054,959	Taiwan, China	1,347,930	United States	993,311	Mexico	576,856
9	Italy	929,072	Indonesia	944,997	Malaysia	1,235,322	Belgium	642,049	France	557,236
10	Netherlands	915,895	Belgium	592,658	Poland	1,201,189	Indonesia	583,522	United Kingdom	516,422
11	Singapore	624,941	Czech Rep.	556,095	Spain	1,051,372	India	544,730	Portugal	501,761
12	Belgium	534,082	United Kingdom	507,154	United Kingdom	963,868	Philippines	503,563	Indonesia	443,676
13	China	524,548	Taiwan, China	468,522	Sweden	952,747	Morocco	492,428	Taiwan, China	413,321
14	Australia	369,977	Hungary	461,257	Indonesia	929,230	Tunisia	459,343	Belgium	397,748
15	Sweden	293,572	Spain	441,059	Belgium	917,702	Korea, Rep.	390,026	Thailand	397,376
16	Switzerland	256,601	Austria	428,371	Mexico	887,260	Spain	366,827	Macao	388,132
17	Korea, Rep.	218,188	Japan	397,254	Austria	810,358	United Kingdom	343,615	Netherlands	382,880
18	Malaysia	197,680	Slovenia	381,930	Thailand	576,149	Romania	337,633	Denmark	346,118
19	Ireland	193,262	Malaysia	381,545	Netherlands	570,365	Thailand	334,553	Singapore	288,407
20	Austria	178,243	Thailand	362,918	Switzerland	478,905	Poland	319,086	Spain	281,182
21	Russian Fed.	173,247	Sweden	344,319	Brazil	417,184	Netherlands	317,771	Canada	271,400
22	Brazil	160,471	South Africa	299,595	Romania	414,798	Canada	298,648	Morocco	269,647
23	Denmark	126,803	Netherlands	299,426	Philippines	385,078	Taiwan, China	269,568	Romania	179,231
24	Mexico	96,197	Denmark	280,915	Czech Rep.	318,094	Denmark	267,301	India	178,273
25	Oman	80,480	Norway	271,301	Slovenia	251,231	Macao	265,852	Tunisia	172,055
26	India	73,025	Portugal	217,418	Finland	191,162	Hungary	249,794	Philippines	145,728
27	Norway	59,332	Argentina	177,685	Portugal	169,936	Bahrain	169,468	Mauritius	142,003
28	Thailand	58,253	Slovak Rep.	173,521	Korea, Rep.	153,585	Singapore	146,340	Hungary	131,441
29	Taiwan, China	55,337	Switzerland	157,898	Slovak Rep.	131,223	Portugal	142,277	Poland	112,576
30	South Africa	55,079	Turkey	119,830	South Africa	120,764	Pakistan	138,645	Malaysia	109,537
31	Poland	49,574	Brazil	91,263	Belarus	106,483	Bulgaria	97,823	Austria	84,716
SA Rank		30		22		30		64		63

SITC Product	8462 Under garments, knitted or crocheted, of cotton		8720 Medical instruments and appliances (n.e.s)		8939 Miscellaneous articles of chemicals		8942 Children's toys, indoor games		8983 Gramophone records and other sound or similar recordings	
Industry Grouping	Apparel		Medical instruments		Rubber / plastic products		Toys / Games		Music	
Rank										
1	China	3,595,004	United States	6,250,362	United States	6,967,883	China	8,555,237	United States	5,056,156
2	United States	3,595,004	Germany	6,250,362	Germany	6,967,883	Japan	8,555,237	Ireland	5,056,156
3	Turkey	2,005,723	Netherlands	2,504,494	China	5,398,928	United States	2,793,442	Japan	4,022,103
4	Mexico	1,696,530	Japan	1,519,935	Italy	4,038,405	Germany	1,953,787	Singapore	2,803,672
5	India	1,304,794	Mexico	1,339,317	Taiwan, China	2,819,826	Netherlands	1,325,498	Germany	2,424,377
6	Hong Kong, Chir	1,054,246	Ireland	1,273,385	France	2,601,832	Taiwan, China	1,003,049	Netherlands	1,997,150
7	Italy	867,716	United Kingdom	1,243,875	United Kingdom	2,307,848	United Kingdom	961,972	Taiwan, China	1,909,896
8	Germany	709,379	France	1,242,063	Canada	1,920,067	Italy	794,059	United Kingdom	1,682,397
9	Portugal	689,845	Belgium	1,161,333	Japan	1,912,821	Belgium	620,197	Austria	1,582,841
10	France	689,774	Italy	1,148,166	Belgium	1,859,009	Mexico	569,047	France	1,055,405
11	Belgium	616,132	Singapore	664,208	Mexico	1,794,435	France	519,861	Korea, Rep.	978,930
12	Thailand	566,027	Switzerland	579,243	Netherlands	1,102,495	Spain	507,000	Mexico	687,309
13	Korea, Rep.	556,855	Sweden	574,852	Switzerland	1,007,463	Canada	496,666	Belgium	597,619
14	Pakistan	536,292	China	567,161	Spain	825,953	Indonesia	484,048	Canada	574,876
15	Indonesia	515,545	Denmark	431,862	Denmark	804,288	Thailand	345,734	India	413,438
16	Greece	504,398	Spain	359,871	Sweden	750,731	Korea, Rep.	296,209	China	355,230
17	Singapore	417,147	Australia	216,470	Korea, Rep.	680,473	Switzerland	271,860	Switzerland	330,156
18	United Kingdom	403,460	Thailand	201,233	Austria	667,643	Austria	235,504	Hong Kong, Chir	305,311
19	Netherlands	366,176	Costa Rica	188,659	Israel	633,630	Malaysia	213,590	Denmark	297,853
20	Peru	340,804	Israel	181,845	Singapore	625,732	Philippines	182,451	Sweden	285,970
21	Mauritius	334,296	Malaysia	175,243	Czech Rep.	586,078	Sweden	161,573	Thailand	262,482
22	Israel	319,181	Canada	172,673	Poland	435,700	Czech Rep.	117,649	Luxembourg	234,958
23	Morocco	287,703	Pakistan	141,818	Thailand	354,584	Poland	107,432	Italy	191,333
24	Denmark	270,430	Korea, Rep.	120,491	Malaysia	349,998	Australia	104,784	Spain	187,422
25	Canada	255,182	Taiwan, China	112,217	Egypt, Arab Rep	313,491	Singapore	101,968	Russian Fed.	150,509
26	Austria	245,873	Finland	93,223	Ireland	279,068	Denmark	99,679	Malaysia	147,990
27	Macao	225,822	Austria	84,949	Luxembourg	243,548	Ireland	97,509	Australia	114,777
28	Malaysia	225,380	Norway	79,494	Finland	197,196	Hong Kong, Chir	77,456	Indonesia	106,295
29	Spain	220,444	Poland	67,636	Hungary	192,863	Hungary	73,082	Finland	101,936
30	Philippines	215,418	New Zealand	50,523	Portugal	174,169	Malta	72,307	Poland	96,082
31	Hungary	207,891	India	50,492	Indonesia	147,910	Finland	52,074	Hungary	79,940
SA Rank	47		41		46		46		45	

[Source: UNComtrade DC: World Bank]