3

Measuring the Performance of Small States

3.1 Introduction

This chapter measures the industrial competitiveness performance of small states in quantitative terms and benchmarks them against each other. Benchmarking exercises of this type allow governments to assess their country's performance in relation to:

- Countries at a similar level of development, or of similar characteristics, which they would like to outperform; and
- Countries at a higher level of development, whose performance they wish to emulate, and whose policy strategies they could learn from in order to do so.

With this in mind, this chapter develops the Small States Manufacturing Export Competitiveness Index to benchmark competitiveness performance across small states. Section 3.2 explores other recent efforts to benchmark competitiveness and highlights the lack of coverage of small economies in these exercises. Section 3.3 attempts to remedy this gap by constructing the SSMECI and presents the results. Section 3.4 provides possible explanations for the competitiveness record in small states through simple statistical analysis of the SSMECI.

3.2 Current Benchmarking Initiatives and Their Appropriateness for Small States

Benchmarking of the type being undertaken here on competitiveness performance across countries has been the focus of increasing interest in recent years. Current benchmarking initiatives include the following:

- The World Economic Forum's (WEF) *Global Competitiveness Report*;
- The International Institute for Management Development's (IMD) *World Competitiveness Yearbook*;
- UNIDO's *World Industrial Development Report*;
- Wignaraja and Taylor (2003).

Table 3.1 summarises the key features of these four initiatives.

Table 3.1: Features of Recent Competitiveness Indices

Publication	World Economic Forum (2003)	Institute of Management Development (2003)	UNIDO (2002)	Wignaraja and Taylor (2003)
Name of index	'Growth Competitiveness Index'	'World Competitiveness Scoreboard'	'Competitiveness Industrial Performance Index'	'Manufactured Export Competitiveness Index'
Concept	Business school approach to measuring national level competitiveness, using both performance and explanatory variables	Business school approach to measuring national level competitiveness, using both performance and explanatory variables	Focused on industrial performance and national ability to produce manufactures competitively	Focused on industrial performance and national ability to produce manufactures competitively
Number of Variables	160	321	4	3
Weighting System	Two tier approach based on a concept of 'core' or 'non-core' innovator countries. Different aggregations and weightings apply to each group in the final index	Twenty categories each weighted at 5 per cent	Four variables, equally weighted	Three variables weighted at 30, 30 and 40 per cent (with technology intensity of exports weighted higher)
Data Source Type	Published data and entrepreneur surveys (7,741 responses)	Published data and entrepreneur surveys (over 4,000 responses)	Published data	Published data
Country coverage (including small states)	Covers 102 countries (eight small states)	Covers 59 countries (no small states)	Covers 87 countries (three small states)	Covers 80 countries (11 small states)
First published/ frequency	Yearly since 1979	Yearly since 1990	2002 and henceforth periodically	2003

The work of the WEF and the IMD, both based in Switzerland, has largely dominated the global competitiveness benchmarking industry. Annual rankings of competitiveness in developed and developing countries have been produced for 24 years by the WEF's *Global Competitiveness Report* and for 13 years by the IMD's *World Competitiveness Yearbook*. Both indices focus on the micro-level business perspective and examine the extent to which nations provide an environment in which enterprises can compete. In line with this, rather than focusing on trying to calculate a measure of *actual* competitive performance, both adopt an approach of looking at a wide range of factors that could *affect* national competitiveness. To this end they use a large basket of variables (160 for WEF and 321 for IMD in 2003), which include both 'hard' published statistics and 'soft' data from surveys of businessmen. The sample size of these surveys is rapidly increasing with 7,741 responses to the WEF 'Executive Opinion Survey' in 2003, compared with 4,600 in 2001.

Both indices are widely used and have attracted considerable attention in the media. They have also generated a wealth of empirical data. So what light can they shed on the competitiveness of small states? Unfortunately, the answer is very little. Despite increasing its coverage from 80 to 102 countries, the WEF index only includes eight countries of the 47 small states in our study. The situation with the IMD index is even worse, with no small states among the 59 countries that it covers. The precise reasons for this lack of coverage are unknown, and without discussion with the institutions involved any attempts to determine such reasons remain simple guesses. However, one of the most significant factors is likely to be that the very complexity of both the indices means that the data requirements simply cannot be met by small states. With small populations and often underdeveloped institutions small states simply do not have the capacity to collect the data required.

The specific issues of small states may also mean that the general theory of competitiveness espoused by both the WEF and IMD is inappropriate for the measurement of competitiveness in the small states context. In small, developing economies, focus on the basic economic fundamentals (macroeconomic stability, outward-oriented trade policies, high levels of human capital and efficient infrastructure) is perhaps more appropriate than worrying about the 200 sub-complexities found in the sophisticated multi-sectoral economies of the developed world.

Quite apart from the lack of attention given to small states, the WEF and IMD competitiveness indices have attracted criticism on technical grounds. Lall (2001b) provides a comprehensive analysis of the WEF index for 2000 and finds flaws in its definition of competitiveness, model specification, choice of variables, identification of casual relations and use of data. He goes on to offer some insights into the construction of competitiveness indices, and although he is not writing with small states in mind, his comments are perhaps particularly relevant in the context of small states:

> To be analytically acceptable, however, all such efforts should be more limited in coverage, focusing on particular sectors rather than economies as a whole and using a smaller number of critical variables rather than putting in everything the economics, management, strategy and other disciplines suggest. They should also be more modest in claiming to quantify competitiveness: the phenomenon is too multifaceted and complex to permit easy measurement. Lall (2001b), p.1520

Wignaraja and Taylor (2003) also offer a critique of the theory and methodology used by the WEF and IMD, including a detailed exploration of the IMD index of 2001. In summary they find that the IMD rankings have:

- *An ambiguous theoretical basis:* The theoretical linkages between the input determinants and national competitiveness are weak. The 'fundamentals' of the IMD 2001 index (pp. 43–49), which detail the 'four fundamental forces of competitiveness', are more of a schema than a theory.
- *Problems of index construction:* The justification for the weightings given to each of the indicators is sometimes weak and often non-transparent. There also seems to be a lack of distinction between variables that indicate competitiveness and those that determine it, with both types used. These lead to problems in interpreting the results and in applying lessons to other countries.
- *Ad hoc data and proliferation of components:* The use of survey data can be problematic in that the perceptions of businessmen in one country cannot be directly compared with the views of businessmen in another country without some kind of mediation. The justification for the recent proliferation of indicators is also weak, with no explanation as to what is being gained by adding more indicators.

Building on this critique, and on the argument that such indices need to be less ambitious and analytically simpler, recent work by UNIDO (2002) and Wignaraja and Taylor (2003) has emphasised the industrial competitiveness performance of developing countries.[9] This is a departure from the somewhat broader (and more vague) concept of national competitiveness implicit in the WEF and IMD work. The two new indices were not developed from a small states-specific perspective, but come closer to the methodology appropriate for this study, and the context of data-sparse small states.

The UNIDO Competitive Industrial Performance Index focuses on the national ability to produce manufactures competitively and is constructed from four basic indicators.

- Manufacturing value added (MVA) per capita;
- Manufactured exports per capita;
- Share of medium and high-tech activities in MVA;
- Share of medium and high-tech products in manufactured exports.

The UNIDO index provides valuable insights into the industrial record of the developing world. Unfortunately, of 87 countries listed in the index, only three are small states as defined in our study. Again, the reasons are unclear, but perhaps even such a simplified index still poses data availability problems.

Wignaraja and Taylor use similar analytical underpinning to UNIDO and construct a Manufactured Export Competitiveness Index (MECI) of 80 developing countries using three variables:

- Manufacturing exports per capita (1999);
- Average manufactured export growth per annum (1980–99);
- Technology-intensive exports as percentage of total merchandise exports (1998).[10]

Of the 80 countries in the MECI, 11 are small states. The results for these economies are shown in Table 3.2 below. The top and bottom three results in the overall MECI are also shown in order to give context to the data and index values for small states.

Table 3.2: Summary of Results from MECI

Overall Rank	Country	MECI Index Value	Manufactured Exports per Capita, 1999 (current $US)		Average Manufactured Export Growth % per year (1980–1999)		Technology Intensive Exports (% of Total Merchandise Exports), 1998	
			Rank	Value	Rank	Value	Rank	Value
1	Singapore	0.93	1	25,039	13	13.4	1	70
2	Malaysia	0.82	5	2,988	3	19.2	4	55
3	Taiwan	0.79	3	5,477	31	9.4	3	58
15	Trinidad and Tobago	0.52	16	645	37	7.7	14	23
24	Mauritius	0.45	12	984	15	12.8	43	3
26	Cyprus	0.45	15	684	62	3.1	23	17
30	Bahrain	0.42	13	953	19	11.6	65	0
38	Dominica	0.38	21	393	34	9.2	65	0
45	Jamaica	0.35	22	377	64	2.8	43	3
50	St Kitts and Nevis	0.33	26	300	57	3.8	65	0
55	Grenada	0.31	52	45	42	7.2	65	0
58	Belize	0.29	41	86	69	0.4	49	2
61	Guyana	0.27	53	37	67	0.9	43	3
67	Tonga	0.24	72	6	50	5.9	65	0
78	Congo, DR	0.15	76	1	74	–2.1	58	1
79	Nigeria	0.13	80	1	71	–1.2	58	1
80	Yemen, Republic of	0.00	78	1	80	–18.0	65	0

Source: Wignaraja and Taylor, 2003

The 11 small states are fairly evenly spread through the middle section of the index, but even the highest performers have MECI values substantially below those of the east

Asian tiger economies (such as Singapore, Malaysia and Taiwan) at the top of the rankings, which puts the performance of small states in perspective. One of the reasons for this is perhaps the universally low level of high technology exports in the small states (whether due to lack of productive capacity or lack of data). While the share of high technology exports was an appropriate variable for the study of 80 developing countries, its applicability for work which focuses on small states exclusively is called into question, as it is either unavailable or not distinctive enough among a small states sample.

Significant differences in the performance of individual small states are visible. Trinidad and Tobago, Mauritius and Cyprus stand out among the sample of 11 small states in the MECI rankings. Explanations for the impressive industrial competitiveness record of Trinidad and Tobago and Mauritius are discussed in Chapters 4 and 5 of this study. In contrast, smaller Caribbean economies, such as St Kitts and Nevis, Grenada, Belize and Guyana, and Tonga in the Pacific have performed poorly compared to the three leading small states.

3.3 A Small States Specific Competitiveness Index

Bearing in mind the limited coverage of small states in the mainstream competitiveness literature and the specific issues surrounding measurement of their performance, efforts to benchmark the export performance of small states require a new small states specific index. As many of the existing methodologies are inappropriate for small states, the design of such an index and the interpretation of its results need to be handled with care. Building on the analytical framework for competitiveness in Chapter 2 and the empirical work of Wignaraja and Taylor (2003), a simple, transparent Small State Manufactured Export Competitiveness Index was developed. The key features of this index are highlighted in Box 3.1 while the rest of the section presents the results by country and aggregate categories.

3.3.1 Country-level Findings

Country-level rankings of competitiveness generate considerable interest in academic and policy circles. Of particular interest are the top performers. Before considering the composite SSMECI rankings, it is useful to start with a brief look at the component variables. Table 3.3 shows the top ten performers for each of the three component variables in the SSMECI. It is noticeable that there is considerable difference in the ranking of the three tables, and that top performers in one component are not necessarily top in others. However, some countries rank consistently high, for example Estonia, which ranks third, third and fourth respectively. The Seychelles also figures in all three lists, albeit at the bottom end. Some countries which figure highly in two of the components, such as Mauritius in per capita manufactured exports and manufacturing value added as a percentage of GDP, do not figure well in the third component, average growth, and this ultimately leads to a lower overall ranking in overall SSMECI. At the same time, a

Box 3.1: Small States Manufactured Export Competitiveness Index

The SSMECI emphasises the ability to produce manufactures competitively in the world's smallest economies. It has been designed in light of the problems with data availability in some small states and the need to build in realistic data requirements in order to make the country coverage of the index as wide as possible. The SSMECI is composed of only three variables, each of which captures a different aspect of industrial competitiveness and which combine to create a simple but effective snapshot of the economy's overall international competitiveness in this area. They are:

- Current performance in world export markets scaled by size;
- The dynamism of this performance over time, i.e. growth rates;
- The size of the manufacturing base in the structure of the wider economy.

The first factor captures an economy's actual record of competing in international markets rather than simply its ability to be competitive. The second captures how dynamic this performance is, and whether the economy is on an upward or downward trend. The third looks at more structural issues, recognising that in a small state where economies of scale are such an issue, a larger manufacturing base is likely to reflect an advantage in achieving competitiveness. To reflect these three concepts and in light of the data issues, three specific variables were selected for the small states index:

- Manufactured export value per capita in 2001 (US$);
- Average manufactured export growth per annum 1990–2001;
- Manufacturing value added as a percentage of GDP in 1999.

Using these variables, the SSMECI was constructed for 40 small states in the Commonwealth and IMF-defined sample set. This sample size is sufficient to be representative and to permit basic statistical analysis of determinants. Calculations were performed to give each country a value between 0 and 1 for each of the three variables, and these were then weighted to produce a final index figure for each country, which could then be ranked. Higher values in the SSMECI indicate greater levels of competitiveness, thus for example, Malta, with a SSMECI of 0.72 is perceived to be more competitive than Djibouti with a SSMECI of 0.22 in Table 3.3.

In interpreting the findings, readers should be aware of the sensitivity of results in small states. When the overall production base is so small, the establishment or closure of a single factory can substantially affect the overall figures for that year. The quality/reliability of the data obtained can also often be poor, due to underdeveloped/understaffed statistics institutions in small states. To a degree, such factors may have influenced the overall rankings and led to marginally higher or lower placement than would be expected. This needs to be taken into account when interpreting the results, though it is unlikely to change the basic patterns.

Full details of data sources, definitions, and methodology for constructing the SSMECI are given in Appendix 3.1.

particularly high ranking on a single variable can push up a country on the overall SSMECI rankings. Swaziland, which comes top of share of manufacturing in GDP, is a case in point.[11]

Table 3.3: Country Rankings for the Three Separate Variables

Manufactured Exports per Capita (current $US)			Average Manufactured Export Growth % per year (1990–2001)			Manufacturing Value Added as % of GDP (1999)		
Rank	**Country**	**Value**	**Rank**	**Country**	**Value**	**Rank**	**Country**	**Value**
1	Malta	4469	1	Brunei	19.50	1	Swaziland	31.69
2	Botswana	2891	2	Maldives	17.07	2	Mauritius	24.56
3	Estonia	2203	3	Estonia	16.86	3	Namibia	15.45
4	Trinidad & Tobago	1666	4	Lesotho	15.70	4	Estonia	15.43
5	Qatar	1331	5	Trinidad & Tobago	13.25	5	Lesotho	15.13
6	Bahrain	1080	6	Bahamas	12.89	6	Belize	14.81
7	Mauritius	940	7	Fiji Islands	12.75	7	Fiji Islands	14.11
8	Brunei	773	8	Grenada	12.48	8	Jamaica	13.93
9	Cyprus	605	9	Seychelles	11.19	9	Seychelles	13.73
10	Seychelles	576	10	Suriname	10.36	10	Malta	12.03

Source: See Table 3.4 for a full description of sources

Table 3.4 shows the full SSMECI ranking for the 40 small states, with the component indices, the ranking in each individual variable and the underlying data values.

Table 3.4: Overall SSMECI Ranking

Overall Rank	Country	MECI Index Value	Manufactured Exports per Capita, 2001* (current $US)		Average Manufactured Export Growth % (1990–2001)**		Manufacturing Value Added as % of GDP (1999)†	
			Rank	**Value**	**Rank**	**Value**	**Rank**	**Value**
1	Malta	0.72	1	4,469	16	5.36	10	12.03
2	Estonia	0.71	3	2,203	3	16.86	4	15.43
3	Swaziland	0.69	17	299	12	7.10	1	31.69
4	Mauritius	0.65	7	940	22	3.14	2	24.56
5	Trinidad & Tobago	0.59	4	1,666	5	13.25	22	7.99
6	Brunei	0.58	8	773	1	19.50	19	8.42
7	Seychelles	0.57	10	576	9	11.19	9	13.73
8	Lesotho	0.56	24	113	4	15.70	5	15.13
9	Botswana	0.55	2	2,891	25	2.25	34	4.97
10	Fiji Islands	0.55	18	266	7	12.75	7	14.11
11	Namibia	0.51	14	398	26	2.15	3	15.45
12	Bahrain	0.51	6	1,080	21	3.25	15	9.88
13	Qatar	0.49	5	1,331	28	1.73	23	7.30
14	Guyana	0.49	19	207	11	10.02	14	10.15
15	Grenada	0.49	16	319	8	12.48	24	7.26
16	Maldives	0.49	23	116	2	17.07	26	6.46

Table 3.4 (continued)

Overall Rank	Country	MECI Index Value	Manufactured Exports per Capita, 2001* (current $US)		Average Manufactured Export Growth % (1990–2001)**		Manufacturing Value Added as % of GDP (1999)†	
			Rank	Value	Rank	Value	Rank	Value
17	St Kitts and Nevis	0.48	11	514	20	3.82	13	10.33
18	Jamaica	0.48	26	105	18	4.51	8	13.93
19	Bahamas	0.47	12	508	6	12.89	38	3.20
20	Barbados	0.46	13	468	23	2.82	16	9.32
21	Belize	0.46	22	122	30	0.00	6	14.81
22	Bhutan	0.46	28	59	14	6.86	11	11.56
23	Cyprus	0.46	9	605	31	–1.68	12	10.54
24	Dominica	0.45	15	357	19	3.94	17	8.48
25	Suriname	0.43	30	21	10	10.36	21	8.12
26	St Vincent/Grenadines	0.41	25	111	17	5.16	25	6.54
27	Gabon	0.39	29	48	13	6.89	32	5.16
28	Solomon Islands	0.39	21	148	27	1.89	33	5.12
29	Samoa	0.37	34	9	15	5.53	28	6.02
30	Vanuatu	0.34	33	9	29	0.53	27	6.35
31	Papua New Guinea	0.32	32	10	33	–5.37	20	8.28
32	Tonga	0.31	35	4	24	2.33	36	3.89
33	St Lucia	0.31	27	83	34	–9.79	29	5.96
34	Cape Verde	0.30	31	21	36	–10.96	18	8.45
35	Antigua and Barbuda	0.27	20	197	37	–13.97	39	2.25
36	São Tomé & Príncipe	0.24	39	0	32	–3.65	35	4.52
37	Djibouti	0.22	37	2	35	–10.90	37	3.60
38	Gambia, The	0.20	36	2	38	–16.74	30	5.60
39	Comoros	0.13	38	1	39	–26.09	31	5.43
40	Kiribati	0.00	40	0	40	–29.07	40	0.99

Source: Data primarily from ITC, using COMTRADE Database, World Bank, *World Development Indicators* (2001, 2002, 2003), and other regional and national sources. See Appendix 3.1 for full details of data sources and methodology.

*In some cases where data from 2001 were not available, 2000 or 1999 data were used. See Appendix 3.1 for full details

**Where data were not available for 1990 or 2001, the nearest available year was used. Growth rates were calculated using a compound method, adjusting for length of time period as appropriate. See Appendix 3.1 for full details.

†Where 1999 data were not available, 1998 or 2000 data were used. See Appendix 3.1 for details.

As might be expected, two European countries, Malta and Estonia, occupy the first two places in the ranking, perhaps reflecting both greater access to markets and the positive effect of sustained competitive pressure from their large European neighbours.[12] The rest of the top ten is made up of some of the traditional small state powerhouses of the various regions, such as Mauritius from the Indian Ocean, Trinidad and Tobago from the Caribbean and Fiji from the Pacific.

The experience of Malta is discussed in Box 3.2

Box 3.2: Some Determinants of Malta's Success

Malta has the highest SSMECI ranking of the 40 small states in this study and it is interesting to highlight aspects of its performance, determinants and public policies. Malta is a small densely populated island in Southern Europe of just over 316 square kilometres with a population of around 400,000 inhabitants. Its GDP for 2003 was estimated to be slightly in excess of US$10,000 per capita and is growing at around 3.4 per cent per annum.

Export-led industry in Malta started to develop in the late 1960s and early 1970s. Until Malta's independence from Britain in 1964, the entire economy revolved around the servicing of the British naval forces based on the island. When the British forces in Malta downsized in the 1950s and 1960s, there was high unemployment and emigration as a result of the very painful restructuring of the economy. It was perhaps these pressures that forced a newly independent Malta to restructure its economy by developing a local manufacturing base, attracting foreign direct investment and encouraging the growth of a vibrant tourism and leisure industry. Significant progress was made in developing the infrastructure required to support manufacturing and tourism. Attractive investment incentives coupled with low wages, attracted significant foreign direct investment.

Trade Policy

Malta, like Trinidad and Tobago and many other small states, initially pursued a protectionist policy based on import substitution. In the 1960s and 1970s the government pursued an import substitution policy which gave indigenous firms an opportunity to benefit from some of the same operating and fiscal incentives accorded to exporting firms, particularly foreign direct investors.

The globalisation of trade and business generally during the last decade saw a multitude of markets reducing tariff and non-tariff barriers and opening up their economies. Malta's insularity, coupled with the micro size of its home market, meant that its only option was to forge even closer relations with the nearest economic block, the European Union.

Greater Access to Markets

Until recently Malta's relations with the EU were governed by Malta's Association Agreement with the European Community which dates back to the early 1970s. By virtue of this agreement, much of what Malta produced was able to enter the EU duty free, provided that certain rules of origin were met. As mentioned above, Malta's high ranking on the SSMECI reflects both access to markets and the positive effect of sustained competitive pressure from its large European neighbours.

As of May 2004, Malta is a full member of the European Union.

Box 3.2 (continued)

Institutional Support

In 2002, three key organisations comprised the institutional support system in Malta:

- The Malta Development Corporation (MDC) – Malta's national agency to promote and attract foreign direct investment. Established in 1967.
- The Malta External Trade Corporation (METCO) – Malta's national trade promotion organisation. Established in 1989.
- The Institute for the Promotion of Small Enterprise (IPSE) – national agency for the promotion of SMEs and industrial restructuring. Established in 1998.

By 2004 these three organisations were amalgamated into a newly established corporation, Malta Enterprise, whose mission is: 'to enable enterprise to maximise Malta's strategic resources and capabilities to successfully compete in uniquely targeted niches'. Malta Enterprise now acts as a national one-stop shop combining trade promotion, investment promotion and enterprise support functions.

The decision to establish Malta Enterprise stems from the government's desire to improve the overall effectiveness of its trade support network, as well as to enhance synergies between the trade, investment and enterprise functions. The establishment of this one-stop shop is thus a strategic response on the part of government to counter ever increasing competition in international markets for both trade and inward investment.

Recent Competitiveness Initiative

As a small state, Malta is a peripheral economy with a high degree of vulnerability, no natural resources (other than its people) and an almost total reliance on international trade for its economic survival.

Malta has a strong industrial sector based primarily on export manufacturing which today accounts for some 70 per cent of GDP, while its export of services, primarily in the form of tourism, accounts for around 30 per cent of GDP. In recent years, there have been significant developments in Malta's potential in three particular services areas: financial and related services (for example back-office services); maritime services (for example ship registration and cruise liners; and distribution and transhipment services (Malta Freeport).

The Government of Malta takes the view that there is untapped potential in these and other service sectors. So far, Malta Enterprise has responded to the needs of a growing number of clients and users by focusing on the services sector. This focus is predicated on the belief that a strategy specifically designed to promote and further develop the services sector is now required. In line with this, the Commonwealth Fund for Technical Co-operation (CFTC) has initiated a strategic programme to assist Malta in improving its competitiveness in the services sector.

Box 3.2 (continued)

Because Malta is a small state, the government believes that the planned, structured development of its services sector is a strategic necessity for various reasons. First, it will help reduce Malta's dependence on manufacturing. Second, it will allow Malta to better utilise its highly skilled, trained and multilingual workforce. Third, it will heighten Malta's potential to sell these services on a regional basis and thus strengthen its position as a hub for international business. Fourth, the local value added component in the services sector could be significantly higher than that in manufacturing as most materials, inputs and semi-manufactured goods are imported. Fifth, Malta's increasing standard of living and attendant increases in the cost of labour and other local inputs means that Malta must move away from the more labour-intensive manufacturing industries to activities that are more skilled and knowledge-based.

The performance of the BLNS states that, together with South Africa, make up the Southern African Customs Union (SACU) is also of interest. All four countries score high: Swaziland is third, Lesotho eighth, Botswana ninth and Namibia eleventh. This high performance may again be due in part to proximity to large markets, and the trade and investment stimulus that an agreement such as SACU produces for its 'satellites'.

Some countries do not perform as well as might be expected. For example, Cyprus, ranked 23, did not perform as well as the other European countries in the sample. Whilst it scored fairly high in terms of per capita exports and manufactured value added, manufactured exports have actually fallen over the last ten years, possibly reflecting a fall in comparative competitiveness, and this negative average growth brings down its overall SSMECI score.

3.3.2 Findings by Region, Income Group and Country Size

In an attempt to establish patterns of performance and provide analytical insights, the 40 small states have been grouped into various categories as follows:

- Geographical region to facilitate comparisons across regions;
- Income per head to permit analysis of different income groups;
- Population to enable analysis by country size.

In each case, the group values for each of the three variables have been calculated using weighted averages, which have then been indexed, using the same methodology as before. Simple averages are also shown for each grouping, calculated using average index values for each country in the group.

Table 3.5 aggregates the results according to geography, allowing the regional breakdown of the results to be analysed.

Table 3.5: SSMECI Performance By Region

Rank	Regional Group*	No.	Weighted Average SSMECI**	Simple Average SSMECI	Manufactured Exports per Capita, 2001 (current $US)		Average Manufactured Export Growth % (1990–2001)		Manufacturing Value Added as % of GDP (1999)	
					Rank	Value	Rank	Value	Rank	Value
1	Europe	3	0.79	0.63	1	2,076	3	8.70	2	12.24
2	Africa	12	0.49	0.42	3	602	5	2.74	1	12.86
3	Asia	3	0.45	0.51	5	351	1	16.95	5	8.46
4	Caribbean/ Latin America	13	0.37	0.45	4	481	2	9.84	4	9.04
5	Middle East	2	0.28	0.50	2	1,200	6	2.41	6	8.21
6	Pacific	7	0.14	0.33	6	51	4	5.01	3	9.53

Source: Table 3.4 and author's calculations

*Regional groupings according to World Bank, *World Development Indicators 2002*.
**Group values calculated from weighted components of sub-indices for members of each region. Where original data for manufactured exports for 1990 and 2001 were not available, data for these years have been extrapolated using the average growth rates of that country. SSMECI values have been calculated using sample maximum and minimum levels.

The high performance of the European region is probably to be expected, as discussed above. In comparison, the relatively high performance of the African region is more surprising, and closer inspection shows that there are in fact two tiers of performance within the region. At the top level, the four BLNS countries, Mauritius and the Seychelles are all in the top 11 of the SSMECI rankings. At the other end, a number of African countries, particularly in West Africa, occupy the bottom ten positions. Overall, the contributions of the top tier performers are enough to obtain a high average in comparison to the other regions. Also of note is the particularly poor performance of the Pacific region, which was not strong in any of the three variables and was significantly lower in the SSMECI rankings.[13] Apart from Fiji at tenth place, the other countries of the Pacific were all in the bottom 15.

Table 3.6 shows the performance by income grouping, which reveals some very interesting results. Rather than running from high income down to low income in a linear fashion, the performance of the four groups is more erratic. High-income countries perform only third best out of the four, with the lowest average growth rates in manufacturing exports and the lowest manufacturing value added as a percentage of GDP. They do have the second highest manufactured exports per capita though, which prevents them from being below the low-income countries. This pattern of results could reflect 'mature' economies that have developed a manufacturing export base, as shown in the high per capita figures, but have then diversified their economies into other sectors such as services, particularly financial services and high-end tourism. In such cases, manufacturing exports per capita would still be relatively high, but growth in manufacturing exports would slow, and value added in manufacturing as a share of total GDP would fall.

Table 3.7 shows the SSMECI performance grouped by population size. This distinction is particularly important to capture the record of micro-states compared with larger small states. In the absence of a universally accepted definition of sub-categories by size, the sample was divided into countries with populations under 250,000 (micro-states), between 250,000 and 1 million, and over 1 million.

The striking finding is that the micro-states record a particularly weak competitiveness performance. This suggests that even within the world's smallest economies, country size matters for industrial competitiveness. Perhaps unsurprisingly, the performance of the larger states was better than the two smaller categories, though the magnitude of this is perhaps unexpected. Many factors probably explain the gap in industrial competitiveness performance between larger small states and micro-states. These include the fact that larger small states have somewhat bigger markets than smaller ones; access to a larger pool of technical and managerial skills; being more attractive to inflows of foreign direct investment; being better able to finance costly infrastructure projects (for example setting up a national airline); and, possibly, being less susceptible to natural disasters.

Table 3.6: SSMECI Performance by Income Group

Rank	Income Group*	No.	Weighted Average SSMECI**	Simple Average SSMECI	Manufactured Exports per Capita, 2001 (current $US)		Average Manufactured Export Growth % (1990–2001)		Manufacturing Value Added as % of GDP (1999)	
					Rank	Value	Rank	Value	Rank	Value
1	Upper-middle income	11	0.84	0.52	1	1,520	1	6.23	2	11.06
2	Lower-middle income	14	0.55	0.40	3	193	2	4.93	1	13.98
3	High income	8	0.36	0.50	2	1,308	4	3.80	4	8.49
4	Low income	7	0.13	0.33	4	38	3	4.62	3	9.09

Source: Table 3.4 and author's calculations

*Income groups according to World Bank, *World Development Indicators 2003*. **Group values calculated from weighted components of sub-indices for members of each income group. Where original data for manufactured exports for 1990 and 2001 were not available, data for these years have been extrapolated using average growth rates of that country. SSMECI values were calculated using sample maximum and minimum levels.

Table 3.7: SSMECI Performance by Population Size Group

Rank	Population Group*	No.	Weighted Average SSMECI**	Simple Average SSMECI	Manufactured Exports per Capita, 2001 (current $US)		Average Manufactured Export Growth % (1990–2001)		Manufacturing Value Added as % of GDP (1999)	
					Rank	Value	Rank	Value	Rank	
1	More than 1,000,000	11	1.00†	0.52	1	615	1	5.96	1	12.42
2	250,000–1,000,000	16	0.63c	0.45	2	592	2	4.34	2	8.72
3	Less than 250,000	13	0.00†	0.36	3	123	3	0.48	3	8.27

Source: Table 3.4 and author's calculations

*Population groups as per author's definition. **Group values calculated from weighted components of sub-indices for members of each population group. Where original data for manufactured exports for 1990 and 2001 were not available, data for these years have been extrapolated using average growth rates of that country. SSMECI values were calculated using sample maximum and minimum levels. †The extreme range of the weighted average SSMECI index values obtained (1.00 and 0.00) reflects the strength of the correlation. The group with population of over 1,000,000 was ranked first in all three variables, thus achieving an index value of 1.00 for all three variables. When weighted this gives an overall SSMECI of 1.00. For the group with a population under 250,000 the reverse is true, with last place rankings in each variable giving 0.00 index values, and an overall SSMECI of 0.00.

3.3.3 *Comparison with Results from Other Indices*

As stated above, one of the reasons for developing the SSMECI is the lack of coverage of small states in the existing literature. The IMD index contains none of the small states in the SSMECI, and so comparison of results is not possible. The WEF index, however, has eight common countries and the MECI of Wignaraja and Taylor (2003) has 11 similarities. A comparison of the resulting rankings is given in Table 3.8.

Table 3.8: Comparison of Results from SSMECI, MECI and WEF Indices

Country	SSMECI Ranking	MECI (Wignaraja and Taylor, 2003)	WEF Growth Competitiveness Ranking 2003
Malta	1	–	19
Estonia	2	–	22
Mauritius	4	24	46
Trinidad and Tobago	5	15	49
Botswana	9	–	36
Namibia	11	–	52
Bahrain	12	30	–
Guyana	14	61	–
Grenada	15	55	–
St Kitts and Nevis	17	50	–
Jamaica	18	45	67
Belize	21	58	–
Cyprus	23	26	–
Dominica	24	38	–
Tonga	32	67	–
Gambia, The	38	–	55

Source: WEF (2003) and author's calculations

Only three countries appear in all three indices, and so comparison across them is difficult. However, if the SSMECI is compared individually with each of the other indices in turn, the results, while not identical, show some correlation. Against the WEF, the results are broadly similar, and while Botswana and the Gambia do slightly better in the WEF rankings than in the SSMECI, the rankings are otherwise fairly similar. The correlation with the MECI is, somewhat surprisingly, less strong, with a number of countries having significantly different rankings. However, if these outliers, including Guyana, Cyprus and Dominica, are excluded, the overall pattern of correlation is again visible.

3.4 Explaining Industrial Competitiveness Performance

Ranking inter-country patterns of competitiveness performance is only the first step in analysing competitiveness. A second and more interesting step is to investigate what factors led to high or low performance. What are the determinants of industrial competitiveness

in small states and what lessons can be learnt for future policy development?

The framework presented in Chapter 2 suggests that determinants fall into two broad categories:

1. Incentive factors and policies made up of issues like macroeconomic conditions, import liberalisation and domestic regulations;

2. Supply side factors and policies, such as human capital, infrastructure, foreign investment and technology.

The former frames the competitive environment for business and sends the specific price signals for firm-level export activity; the latter provides inputs and support for this process. Successful industrial competitiveness performance is a result of the interaction of these two sets of determinants.

To fully explore these determinants and to answer the policy questions inherent in them, two kinds of statistical testing, a simple t-test and regression analysis, were undertaken. Given the issues of data availability and data quality highlighted above, this is problematic for small states, but the following sections attempt to provide some preliminary analysis.

3.4.1 T-Test and Variables

A two-sample *t*-test of the variable means is a simple but useful test to analyse determinants of competitiveness in small states.[14] It analyses whether the two sample means are equal, and thus whether the two groups are distinct in statistical terms. By using the top 20 and bottom 20 performers in the SSMECI as our two samples we can determine whether the mean for a particular determinant is different in the two groups. If, for example, the mean value for a particular determinant (for example FDI stock) is higher in the top 20 sample to a level that is statistically significant, this would imply that high stocks of foreign investment are associated with high SSMECI performance, which implies that it has an impact on competitiveness.[15]

Tests of this nature were conducted on 25 separate variables to see which factors were statistically significant. Variables were utilised from both the incentive and supply side categories detailed above and were divided into eight sub-categories:

- *Macro-environment*: A stable and predictable macroeconomic environment, characterised by low inflation and interest rates, sustained GDP growth and high levels of saving and investment, is widely accepted as a fundamental condition for business activity. Five variables are used in this category, covering a wide scope of macroeconomic variables.

- *Country size:* Recent literature has shown that country size is inversely correlated with susceptibility to economic, political and environmental risks. Traditional economic theory would also suggest that larger country size may allow greater economies

of scale and scope. Population is used as a proxy for country size as this has been shown to have the same result as more complex indices based on variables such as total GNP, population and total arable land.[16]

- *Trade and investment regime:* An open trade and investment regime exposes the business sector to overseas competition, encourages economies of scale through increased market access and facilitates technological transfer. Three proxies of openness are used as well as inward FDI stock.

- *Vulnerability:* 'Vulnerability', whether in the form of susceptibility to natural disasters or over-reliance on one commodity may hamper the competitiveness of economies. Five variables are used to test this hypothesis, including both singular and composite measures of vulnerability.

- *Structural:* The overall structure of economic activity may impact on competitiveness, with a move away from low-value-adding agriculture into manufacturing and services, freeing labour and benefiting the overall competitiveness of the economy. However, at the opposite extreme, a lack of agricultural and mineral activity may prevent exploitation of potential for value-added industries based on natural resources. Two basic measures of economic structure are used.

- *Infrastructure:* Efficient and cost competitive physical infrastructure allows businesses to compete in the global market without constraint and for small states particularly, modern ICT infrastructure creates the possibility of escaping the 'tyranny of distance', and staying abreast of the latest technological innovation and production techniques. Three variables of modern ICT infrastructure are used.

- *Human capital:* A strong base of productive human capital is recognised as being the basis for industrial innovation and competitiveness. Education and training provide productive numerate workers with the skills to compete successfully. Four variables are used covering enrolment rates at different stages of education and adult literacy.

- *'Development':* Whilst not strictly a 'determinant' of competitiveness, a country's level of development would be expected to correlate with its level of competitiveness, even if the direction of causality is complicated. Three variables are used as a proxy for overall 'development'.

3.4.2 The T-Test Results

Table 3.9 shows the results of the *t*-tests on the means of the variables for high performing sample countries (top 20) and the low performers (bottom 20). Data availability determined the sample size for a given *t*-test. In some cases the sample size would ideally be larger, but in all cases it is big enough to have statistical relevance and it is not low by cross-national statistical analysis standards.

Table 3.9: *T*-Tests to Examine the Significance of Determinants

Determinants	High Performers Top 20		Low Performers Bottom 20		*t*-stat	Significant at 5% (*also at 1% level)
	Mean	Observations	Mean	Observations		
Macro Fundamentals						
Inflation % (average 1996–2000)[b]	4.4	20	12.0	20	–1.10	
GDP Growth % (average 1990–1999)[b]	5.6	17	3.5	19	1.75	✔
Interest Rate % (1999)[bc]	13.1	17	16.8	15	–1.75	✔
Gross Domestic Saving as % of GDP (1999)[b]	20.8	16	12.8	16	2.14	✔
Gross Capital Formation as % of GDP (1999)[a]	26.4	16	25.9	16	0.15	
Country Size						
Population (2001)[a]	886,869	20	666,785	20	0.73	
Population (excluding PNG)[a]	886,869	20	425,429	19	2.49	✔*
Trade and Investment Regime						
FDI Inward Stock % of GDP (2000)[d]	75.4	18	42.8	18	1.86	✔
Imports as % of GDP (1999)[b]	62.5	20	66.1	20	–0.31	
Exports as % of GDP (1999)[b]	51.4	19	30.9	20	2.10	✔
Imports/Exports as % of GDP (1999)[b]	111.3	20	97.0	20	0.92	
Vulnerability						
Vulnerability to Natural Disasters[e]	127	17	170	20	–0.72	
Composite Vulnerability Index[e]	7.55	17	7.41	20	0.21	
UNCTAD Diversification Index (2000*)[f]	0.77	15	0.69	13	1.97	✔
UNCTAD Concentration Index (2000*)[f]	0.46	16	0.51	14	–0.76	
Number of Commodities Exported (2000*)[f]	81.9	16	25.3	14	3.62	✔*
Structural						
Agriculture Value Added % GDP (1999)[b]	7.9	18	18.4	19	–3.28	✔*
Services Value Added % GDP (1999)[b]	59.4	18	58.9	18	0.09	
Infrastructure						
Telephones/Mobiles per 1000 pop. (2000)[a]	379	20	220	17	1.90	✔
Internet Users (2001)[a]	46,000	20	33,974	19	0.50	
Personal Computers per 1000 pop. (2001)[a]	87.2	17	79.4	16	0.33	
Human Capital						
Adult Literacy as % of population (1999)[a]	88.6	18	71.5	13	3.07	✔*
Secondary Enrolment (2000)[a]	66.2	13	57.8	11	0.90	
Tertiary Enrolment (2000)[a]	14.9	13	11.5	10	0.62	
Development						
GDP per Capita 2001 (current US$)[a]	6,833	20	2,531	20	2.62	✔*
GDP per Capita 2001 (PPP US$)[g]	10,203	20	5,145	18	3.07	✔*
HDI Index Value 2003[g]	0.76	20	0.67	18	2.34	✔

[a]World Bank, *World Development Indicators 2003*; [b]Commonwealth Secretariat, *Small States, Economic Review and Basic Statistics*, Volume 7, 2002; [c]IMF, Various Country Reports; [d]UNCTAD, *World Investment Report 2002*; [e]Atkins and Easter, 2002; [f]UNCTAD, *Handbook of Statistics 2002*; [g]UNDP, *Human Development Report 2003*.

The main findings are as follows:

- *Macro-environment:* The higher performing sample countries had significantly higher average savings ratios and lower interest rates (both at the 5 per cent confidence level). This may suggest that cost and availability of capital is a driver of SSMECI performance. The means of GDP growth of the two samples are statistically different at the 5 per cent level (5.6 per cent compared to 3.5 per cent between 1990–99). Whilst the high performing sample countries do have a lower mean inflation rate, the difference is not statistically significant at the 10 per cent level. Nor was the gross capital formation ratio.
- *Country size:* Using the full dataset the difference in the means of population size for the two samples were not statistically significant. However, if Papua New Guinea is not included in the sample (at 5.25 million, it is something of an outlier in the group), then the means are highly significant to the 1 per cent confidence level. This backs up the theory that size, even within the small states grouping, is a significant factor in SSMECI performance.
- *Trade and investment regime:* The high performing sample countries have significantly greater means for FDI stock (at the 5 per cent confidence level), which would confirm the suggestion that FDI is a driver of competitiveness, through generation of export production and technological transfer. Unsurprisingly, openness as measured by the exports-to-GDP ratio was significant, but imports-to-GDP and the combination of exports and imports-to-GDP were not significant. On the one hand, this is surprising, but perhaps reflects the fact that all small states are by nature fairly reliant on imports, perhaps even more so if they lack competitiveness.
- *Vulnerability:* Some measures of vulnerability showed high levels of significance, particularly those relating to the structure and diversity of production. The number of commodities exported were significant at the 1 per cent level, while the UNCTAD diversification measure was significant at the 5 per cent level. Perhaps surprisingly, the recent attempts to produce vulnerability indices were not significant, with neither the Natural Disasters Vulnerability Index or the Composite Vulnerability Index producing statistically significantly different means across the samples.
- *Structural:* The structural variable showed that high-performing SSMECI countries had a significantly lower mean for the share of agricultural value added in GDP than the lower performing group (at the 1 per cent confidence level). Given the nature of the index this is perhaps not surprising and represents the traditional shift from agricultural production to manufacturing and industry. The share of services value added in GDP was not significant at the 10 per cent level.
- *Infrastructure:* In the area of modern infrastructure the difference in means for telephone connections (fixed lines and mobile) was significant at the 5 per cent level,

suggesting that communication and information flow is a factor in competitiveness. The number of internet connections and personal computers was not significant, however; this may be because it is too early for such new technology to be feeding through to the indicators found in the SSMECI.

- *Human capital:* The importance of human capital in determining competitiveness may be suggested by the high significance (at the 1 per cent confidence level) in the difference in means between samples for levels of adult literacy. For both secondary and tertiary level education enrolment rates the higher performing SSMECI countries had greater means than the lower, however this was not statistically significant at the 10 per cent level. This lack of significance may have been affected by poor data availability in these datasets.

- *Development:* As expected, the relationship between overall development and performance in the SSMECI was strong. Both measures of GDP per capita had significantly higher means in the top-performing SSMECI countries (at the 1 per cent confidence level), whilst for the Human Development Index the means were significantly different at the 5 per cent confidence level.

3.4.3 Linear Regression Analysis

Limited linear regression analysis was also undertaken on the whole sample of 40 small states to complement the two-sample *t*-test. Regression analysis is a more powerful method of depicting causality between variables than the *t*-test.[17]

The dependent variable in the linear regression analysis was the SSMECI and there were nine independent variables under seven headings. The independent variables and the results of the linear regression analysis are shown in Table 3.10.

Even though the method of testing is different, the significant determinants are broadly similar using regression analysis, as with the basic t tests above. This would suggest that the determinants identified as being different between the high and low performing groups do have some causal relationship with SSMECI performance.

Three determinants (number of commodities exported, adult literacy and agricultural value added) are significant at the 1 per cent level, and another four at the 5 per cent level (UNCTAD Concentration index, Exports as a percentage of GDP, Telephones per 1000 people, and population). For some determinants the R-squared variable is fairly high, suggesting a good fit with the index considering the nature and number of variables.

More work is needed to more fully explore the causal relationships between the determinants and the SSMECI, using more sophisticated statistical techniques including multiple regression analysis and panel data analysis. However, the limited dataset available on small states has prevented this work from being undertaken at this time. Further work is needed to secure a fuller small states dataset.

Table 3.10: Linear Regression Analysis with Dependent Variable, SSMECI

Coefficient	*t*-stat	*p*-value	R-squared	Significance	Rank
Country Size					
Population		0.0000	2.178	0.0358	0.113670	7
Macro Fundamentals					
Average GDP Growth %		0.0091	1.397	0.1709	0.051439	9
Trade & Investment Regime					
FDI Inward Stock % of GDP		0.0008	1.563	0.1273	0.067044	8
Exports as % of GDP		0.0019	2.570	0.0143	0.151446	5
Vulnerability					
UNCTAD Concentration Index		–0.4391	–2.823	0.0087	0.221580	4
Number of Commodities Exported		0.0022	5.460	0.0000	0.515676	1
Structural					
Agriculture Value Added % GDP		–0.0062	–2.966	0.0054	0.200811	3
Infrastructure					
Telephones/Mobiles per 1000 pop		0.0003	2.271	0.0289	0.119509	6
Human Capital					
Adult Literacy as percentage of population		0.0053	3.610	0.0011	0.310094	2

Source: Table 3.9 and data years

Appendix 3.1: Construction of the SSMECI

This appendix covers the technical details of the methodology used to construct the Small States Manufacturing Export Competitiveness Index, together with notes on data sources and definitions.

Data – Definitions and Sources

Definition of 'Manufacturing'

The commonly used international definition of manufacturing is used throughout, which is defined using the Standard International Trade Classification (SITC) codes. The manufacturing sector is represented by the addition of the values for SITC code levels 5, 6, 7 and 8 minus the value of code level 68. The use of such a definition has both benefits and costs, but in light of the data constraints posed by small states, was the only realistic option. In order to put together data for as many countries as possible, a variety of sources had to be used (see below). The use of an international definition made this task more accurate in terms of common definitions across multiple sources, and more realistic as far as availability is concerned.

Ideally, it would have been useful to define manufacturing to include more of the food processing industry, as this is often a large component of small states' export production. However, without access to disaggregated data for each country this was not possible, and in the interests of larger samples, a more standardised definition was more appropriate.

Definition of Small States and Countries

The standard Commonwealth definition of small states has been used throughout this paper and is used here. Using this classification, 32 Commonwealth member countries are small states. They include four countries with small state characteristics despite their larger populations (Papua New Guinea, Swaziland, Lesotho and Namibia). To increase the sample size slightly, the IMF definition of small states was also used; this identifies 43 small states, and when combined with the Commonwealth list, produces a final sample of 47 countries.

Data Sources

As mentioned above, given the difficulties of obtaining data in many small states, a number of sources were used, as detailed in Table A3.1.

For the first two variables the main source was the International Trade Centre (UNCTAD/WTO) with data extracted from the COMTRADE database. This was supplemented using data from the UNCTAD *Handbook of Statistics*, ITC's PC-TAS, and the World Bank *World Development Indicators*. National Sources were used where there were gaps in the data, or to verify erroneous values. In certain circumstances, gaps in data have been estimated using standard imputation techniques with other data from that country.

Indexing Methodology

The SSMECI is a composite index constructed using a methodology similar to that used for the UNDP Human Development Index (HDI).[18]

Table A3.1: Precise Sources of all Data in SSMECI

Country	Manufactured Exports				Manufactured Value Added as % of GDP[f]
	Year	Source	Year	Source	Year
Antigua and Barbuda	1991*	WTO[a]/ITC	1999	ITC	1999
Bahamas	1995	ITC[b]	2001	ITC	1999[g]
Bahrain	1994	ITC	2001	ITC	1997
Barbados	1990	ITC	2001	ITC	1999
Belize	1992	ITC	2000	ITC	1999
Bhutan	1991	ITC	1999	UNCTAD HOS	1998
Botswana	1991*	ITC/WTO	2001	ITC	1999
Brunei	1990	ITC	1998	ITC	1999[g]
Cape Verde	1995	ITC	2001	ITC	1999
Comoros	1995	ITC	2000	ITC	1999
Cyprus	1990	ITC	2001	ITC	1999[g]
Djibouti	1990	ITC	1995*	UNCTAD/WTO	1999[g]
Dominica	1990	UNCTAD[c]	2001	ITC	1999
Estonia	1995	ITC	2001	ITC	1999
Fiji Islands	1988	ITC	2000	ITC	1999
Gabon	1993	ITC	2000	ITC	1999
Gambia, The	1995	ITC	2000	PCTAS	1999
Grenada	1990	ITC	2001	ITC	1999
Guyana	1991*	FTAA Web[d]	1998	FTAA Web	1999
Jamaica	1990	ITC	2000	ITC	1999
Kiribati	1990	ITC	1999	UNCTAD HOS	1998
Lesotho	1991	NATIONAL[e]	2001	NATIONAL	1999[g]
Maldives	1995	ITC	2001	UNCTAD HOS	1998
Malta	1990	UNCTAD	2001	ITC	1999[g]
Mauritius	1990	ITC	2001	UNCTAD HOS	1999
Namibia	1991	WTO/ITC	2001	ITC	1999
Papua New Guinea	1990	ITC	2000	ITC	1999
Qatar	1990	ITC	2001	ITC	1999[g]
Samoa	1990	ITC	2001*	ITC/WTO	1997
São Tomé & Príncipe	1995*	UNCTAD/WTO	2001*	UNCTAD/WTO	1999
Seychelles	1990	ITC	2001*	WTO-ITC	1999
Solomon Islands	1990	WTO-HDI[e]	2001*	HDI-WTO	1999[g]
St Kitts and Nevis	1988	UNCTAD HOS	2001	ITC	1999
St Lucia	1990	ITC	2001	ITC	1999
St Vincent/Grenadines	1993	ITC	2000	ITC	1999
Suriname	1990	ITC	2000	UNCTAD	1998
Swaziland	1990	WTO-HDI	2001	ITC	1999
Tonga	1991*	ITC/WTO	2000	UNCTAD HOS	1998
Trinidad and Tobago	1990	ITC	2001	ITC	1999
Vanuatu	1990	ITC	2000	UNCTAD HOS	1999[g]

*Imputed from figure for alternative reference year (1990 or 2001), using total export figures from the WTO and using the assumption that the percentage of manufactured exports in total exports stays the same.
[a]World Trade Organisation, *World Trade Statistics 2002*; [b]International Trade Centre using COMTRADE database; [c]United Nations Centre for Trade And Development, *Handbook of Statistics 2003*; [d]Free Trade Agreement of the Americas (FTAA) website; [e]Data from national source, for example Central Bank or Statistical Office; [f]*United Nations Human Development Indicators 2001*; [g]*World Development Indicators 2001* unless otherwise specified.

Indexing the Variables

For each of the three variables an index value was calculated using the following general formula:

$$\text{Index} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}}$$

A key consideration in such a calculation was determining the minimum and maximum values that were appropriate. In the absence of a theoretical rationale suggesting definite alternatives, the maximum and minimum values in the relevant sample set were used.

For example, value added from manufacturing as a percentage of the GDP of the Fiji Islands was 14.11 per cent in 1999, the sample maximum is 31.69 in Swaziland and the sample minimum 1 per cent in Kiribati. The index for Fiji is therefore:

$$\text{MVA Index} = \frac{14.11-1}{31.69-1}$$

$$= 0.43$$

This method was used for the manufacturing value added variable, and the growth of manufactured exports variable. However, for the manufactured exports per capita variable the extremely high values of some countries in the sample meant that all except three countries had an index value of below 0.4. This has the effect of introducing a large bias in the overall index in favour of the top three countries. In order to attempt to discount these extreme variables, logarithms were used in the calculations. However, this over-compensated for the bias, and even low performers were attaining index values of above 0.8. In order to even out the effect, an average of the two was used, i.e. the average of the two values produced from using logarithms and from not using them.

Rank correlation calculations were used to measure the effect of the use/non-use of logarithms on the SSMECI order. The rank correlation between the SSMECI based on a logarithmic approach and the 'average' method above is 0.985, while the rank correlation between the SSMECI based on a non-logarithmic approach and the 'average' method above is 0.993. Thus while the average method refines the index, its overall impact is relatively limited.

Weighting the Indices

The three variables were weighted 40%:30%:30%, with manufacturing exports per capita gaining the largest 40 per cent weight. This approach has been adopted, rather than the perhaps more obvious choice of equal thirds, given the particular interest in current performance and the need to account for the varying sizes of the countries involved.

As above, the ranking is robust compared with the use of an equal weighting, with a rank correlation of 0.993 between the results of the two methods.