Successful industrial policies and Integration: connections, tensions and interactions [1]

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9th.Novembre 2006
(Draft version, not to be quoted)

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[1] Paper prepared for the conference on "*Responding to Globalization in the Americas: The Political Economy of Hemispheric Integration*" convened by Diego Sanchez Ancochea (Institute for the study of the Americas) and Ken Shadlen (London School of Economics). June 1-2, 2006. London School of Economics.

Introduction

The central topic of this paper is the relationships between industrial policies and regional integration agreements. This is important because, in the last few decades, from the traditional perspective of emphasizing physical capital industrial policies have been forced to modernize and broaden its scope, essentially, by the integration of global trade and financial markets and the speed of technological change, overlapping frequently with trade and technology policies. Is in this context that the study of Regional Integration Agreements (RIA) gives further insights on how successful industrial policies can be, and particularly, how industrial polices are best implemented within a RIA.

We are particularly interested in industrial development because of its vital impact on growth and productivity. Productivity is the one characteristic of industrial activity that most clearly points to the wider consequences of industrial progress for the whole economy and stands for industry's contribution to the increase of welfare. On the other hand, growth is widely known to help to reduce poverty faster than any other tool (Deininger-Squire, 1996; Foster and Szekely, 2001; Dollar and Kraay, 2002; Ravallion 2002). Therefore, productivity and growth together stand summarily for industry's contributions to the increase of welfare and the alleviation of poverty and marginality, which we believe should be the foremost aim of policymakers in developing countries.

When looking at the relationship between industrial performances (as measured by the CIP index, introduced in section 1 below) and the level of income per capita, it has been found that conventional expectations are confirmed. The positive association between the CIP index and GDP per capita is strong and suggests that an increase of 0.01 of the former would lead to a rise of between $250 and $300 (in 1990 prices) in the latter (UNIDO, 2004, 2005). [2]

However, the argument for a pro-growth (and hence pro-poor) role of competitive industrial performance would be strengthened considerably if GDP growth were seen to be affected directly and positively by the CIP score. This is indeed the case, as a regression of the 1990-

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[2] This result comes as no surprise, considering the widely held view that development of an internationally competitive manufacturing sector is very likely to help raise incomes in the aggregate economy. The nature of the relationship between the CIP index and GDP per capita stays virtually the same, and its strength increases, if instead of considering only one year; performance in 1990 is compared with income in 2000.If the 2000-level of GDP per capita is regressed on the 1990-score of the CIP index, the t-value rise to 9.6 and the adjusted R-square to over 0.6(the sample consisted of over 50 developing countries examined on the basis of data for 1990 and 2000).

to-2000 growth rate of GDP per capita on the CIP score of the initial year shows. [3] Results obtained along these lines show that the initial level of income exerts the expected negative impact, while industrial performance retains its positive and significant effect on subsequent growth. [4]

In addition, we have found that the association between performance and productivity is positive throughout and shows a systematic trend. [5] At a deeper level, this finding is likely to reflect causation of a kind that is essential to the overall analysis of this paper. In fact, there are a handful of generic factors (some of them named 'drivers' and quantified in the first section of the paper), which seem to determine the main components of both industry's growth and its competitive performance. And this co-determination is becoming ever more closely related.

Therefore, it can be argued that productivity, growth and competitive performance (in the terms of the CIP index) are closely related and these are our basis to believe that the study of industrial performance is relevant for development and policy-making.

The rest of the paper is organized as follows: in Section I we will further explore a measure of competitive industrial performance in the context of a modern and globalize economy, explaining the fundamental reasons behind that performance (the "drivers"). Later in that section, we introduce the concept of "social capabilities" which is closely associated to the CIP index and to the drivers, being those social capabilities the space in which the effort of the countries in terms of drivers is reflected. In other words, when countries develop their drivers, they are ultimately building social capabilities.

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3 While the positive association with GDP growth is weaker than with GDP levels, it is still highly significant. Industrial performance explains about one-third of the variation in GDP per capita growth across developing countries in the same sample. A slightly expanded regression exercise can take into account the so-called 'convergence' hypothesis.

4 We are completely aware of the endogeneity that could be present here, but it is almost impossible to correct for its existence with only a cross–country analysis. The case studies in section 2 show some remedial actions in order to correct for endogeneity showing how good drivers at the beginning of a given period have a positive impact on economic growth (i.e. even if Ireland and Mexico grew after regional integration agreements were put in place, Ireland grew faster). For more on the endogeneity on growth regressions see Rodrik (2005). On the other hand, one key variable is missing from the set of industry-specific indicators underlying the CIP index, mainly for reasons of data availability: a measure of productivity. That such a measure is crucially important as a performance indicator applied to industry need not be argued. We can still provide evidence of how the CIP index and productivity are linked.

5 This analysis was done for the 1980-2000 sample. While in the initial year this correlation (0.213) was insignificant, it strengthened dramatically and became significant in the middle year (0.438), then rose once more in the last year to a level of high significance (0.611). Hence, it appears that over two decades the need to account directly for labour productivity in the assessment of industrial performance has been reduced. (this evidence was obtained by correlating the CIP index score and the level of average labour productivity for the whole manufacturing sector. In this way we investigate how closely competitive industrial performance is related to the main driving force behind the growth of industry – productivity growth.

Section II revises the recent phenomena of Regional Integration Agreements, with a focus on the impact they may have on the drivers that, in turn, determine competitive industrial performance. In particular we are interested in the effects of Integration on the development of social capabilities. The case studies of Mexico and NAFTA and Ireland and the UE will serve to illustrate our points of the interlinkages of industrial policy, regional integration agreements and different institutional settings.

Section III has some final remarks on the "varieties of regional integration" linked to our case studies of Ireland and Mexico and, finally, Section IV offers some preliminary conclusions.

1. Industrial Policies and Competitive Industrial Performance.

There can be little controversy about the crucial role of technology for the progress of society. In particular in economics, the importance of technology is vastly acknowledged (Solow, 1956, 1957 Lucas 1988, Romer 1986). Where there has been some considerable controversy is on how much technological progress and related productivity improvements account for convergence among countries with different income per capita levels.

This dilemma was stressed by the new growth theory developed by Romer (1986) and others. He postulated that technical progress is endogenously driven by the economic system and that this can lead to increasing returns to capital investments. He concluded that for these reasons the extension of Solow's model to developing countries was not warranted. These discussions are still very much at the centre of the current debate on what causes growth (The Economist, 25th may 2006).

What are, then, the factors lying behind the wide variation across countries in growth performance and how their impact may change between stages of development or simply over time? In the present paper two of these factors are singled out for discussion: the first one is more broadly defined as the bundle of processes determining what is referred as to (competitive) performance of the industrial sector, the second is regional integration and its interaction with social capabilities.

While we discuss further the latter in the next section, the present one focus on industrial performance and policy and, therefore, a definition of a modern industrial policy must be attempted.

For us, in a world subject to ever-increasing speed of technological change, such definition should not overemphasize physical capital. Instead, in a globalize and modern economy industrial policy should target the mobilization of information, knowledge, skills and technology to help *raising productivity* and achieve *sustained long term growth rates* with the ultimate aim of *increasing living standards*. That would be the measure of its success.

1.1: How to benchmark industrial performance: the use of the Competitive Industrial Performance (CIP) index.

In this paper we make use of a recently developed index of industrial performance, the Competitive Industrial Performance (CIP) Index, benchmarking 155 countries over 1980-2000. [6] (IDR, UNIDO, 2002). To make our proposed definition operational we need to depart form simple quantitative approaches relative to the share of industry in GDP adding some qualitative elements such as industrialization intensity (in technology terms) and export quality.

The CIP index in its refined version (IDR, 2003 and 2004) covers selected crucial features of industrial activity for as many countries as the data permits. It uses "hard" quantitative data rather than "soft" qualitative or survey information; in this it differs from other indices that mix hard and soft data. The index is intended to provide policymakers and analysts with information to locate countries in the evolving global scene, comparing performance to direct competitors, countries ahead (the role models) and a little behind (future competitive threats).

Although theory can provide some guidance on how to assess if a country is doing well in terms of industrial production, exports or technological upgrading, much room is left for

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[6] There is a 'core group' of 93 economies with data for all three years, and there are maximum numbers of countries for the three years, namely, 107 in 1980, 108 in 1990 and 155 in 2000 (the surge in the last year being largely due to the inclusion of a number of transition economies).

intuition in the design of a measure. Hence, the present index is probably a good practical way to evaluate national performance. If other countries are doing consistently better in a similar global setting (and in the absence of macroeconomic disruptions, natural disasters, conflicts or other shocks), something clearly has to be done to improve performance. Simple benchmarks like the ones given here only provide a starting point, of course; still needed in order to devise strategies are much more detailed analysis of the drivers of industrial competitiveness (some of which are noted below), the policy framework and investment climate, institutions, governance and the like. We attempt to follow such line in subsection 1.3 below on social capabilities and the related measurements shown in Figure 1.2.

The aim of such index is to benchmark industrial competitiveness by comparing exports per capita and manufactured value added per capita as well as the level of medium and high technology incorporated in the industrial process. Such index also benchmarks five leading factors (or "drivers") that greatly influence competitive industrial performance: skills, technological effort, inward FDI, technology licensing and modern infrastructure.

The aim of the analysis is first, not to fully account for national industrial performance but to capture key influences on industrial performance and second, to have comparable quantitative data across a wide range of economies. While the methodology behind the CIP index is consistent through time, more detailed information is incorporated in 2004 to this measure, by subdividing two of the index components. [i] (See Technical annex, Box 1 for further details)

1.2 Who is doing well and why: Accounting for success and failure over time in the CIP index.

On a regional level, there has been a small, steady decline in the CIP index for the industrialized world and a steady, rapid rise in East Asia's.

The index for Latin American Countries (LAC from now on) starts at the same level as East Asia, declines in the 1990s and rises in 2000, ending the period slightly higher than at the start.

The MENA (Middle East and North Africa hereafter) starts with the lowest index value in 1980, improves significantly in the first decade and slows down in the second. South Asia has

a consistent but small rise in both decades. SSA (Sub Saharan Africa) ends the period more or less where it started, but this time behind the MENA region.

That said, regional aggregates do not show the role of 'outliers' in each region, like China in East Asia, Mexico in LAC, South Africa in SSA or India in South Asia. As we can see in Figure 1 below, overall, and among developing regions, East Asia (EA) is the best performer followed by the heterogeneous group of transition economies (TE), third comes South Asia (SA) and fourth the group of Latin-American countries. Fifth place is for the MENA countries and last place is for Sub-Saharan Africa.

The relative position of the different regions can be observed in the Figure 1.1 below.

Figure 1.1 CIP index level (mean), by regions.
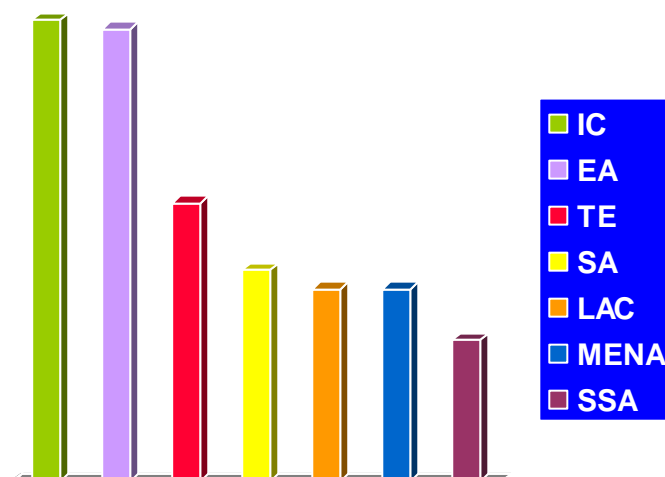
Source: 2004 IDR (UNIDO),

Countries' performance in the index tends to be stable showing how difficult it is to modify the structural factors underlying competitiveness at any level of the ranking.

As shown in the table below, Singapore for instance, was the best global performer in 1990 and 2000. Next comes Ireland, which leaped to second place in 2000 from ninth in 1990 and 19th in 1980. Ireland being an exceptional case will be subject to a deeper examination in Section 2. Interestingly, Singapore and Ireland followed similar strategies, entering high-technology global value chains and developing strong human capital and infrastructure. Mature industrial countries, led by Switzerland, hold the next six places in 2000.

For another group of high performing countries important shifts in the scale are observed. Malaysia was in the position number 40 in 1980, 23 in 1990 and 15 in 2000 while Thailand ranked 47, 32 and 23 respectively. Korea moves from position 23 in 1980 to 10 in 2000. In spite of its enormous population China managed to move from rank position 39 in 1980 to 24 in 2000. Hungary moved from rank 30 in 1980 to 24 in 1990 and 20 in 2000. Mexico, the best Latin American performer moved from rank 31 to the 26 between 1980 and 2000 and will also be examined more in detailed in section 2.

Here below in Table 1, the full ranking:

Table 1   Ranking of countries by the CIP Index, 1980, 1990 and 2000

Rank	Economy (2000)	Score	Rank	Economy (1990)	Score	Rank	Economy (1980)	Score
1	Singapore	0.833	1	Singapore	0.772	1	Switzerland	0.758
2	Ireland	0.738	2	Switzerland	0.748	2	Singapore	0.683
3	Switzerland	0.717	3	Germany	0.683	3	Germany	0.658
4	Finland	0.648	4	Japan	0.661	4	Sweden	0.604
5	Sweden	0.633	5	Sweden	0.611	5	Japan	0.585
6	Japan	0.615	6	Belgium-Luxembourg	0.601	6	Belgium-Luxembourg	0.569
7	Germany	0.594	7	Finland	0.561	7	Netherlands	0.536
8	Belgium-Luxembourg	0.567	8	Austria	0.547	8	Finland	0.519
9	Taiwan, Prov. of China	0.549	9	Ireland	0.530	9	France	0.513
10	Korea, Rep. of	0.537	10	Netherlands	0.525	10	Italy	0.511
11	United States	0.517	11	Italy	0.522	11	Austria	0.497
12	Austria	0.512	12	France	0.509	12	United Kingdom	0.496
13	Netherlands	0.508	13	United Kingdom	0.505	13	United States	0.489
14	France	0.493	14	United States	0.504	14	Denmark	0.480
15	Malaysia	0.492	15	Taiwan, Prov. of China	0.497	15	Norway	0.455
16	Italy	0.488	16	Denmark	0.485	16	Hong Kong SAR	0.443
17	United Kingdom	0.481	17	Canada	0.455	17	Canada	0.440
18	Canada	0.472	18	Korea, Rep. of	0.440	18	Taiwan, Prov. of China	0.428
19	Denmark	0.460	19	Spain	0.438	19	Ireland	0.426
20	Hungary	0.459	20	Hong Kong SAR	0.431	20	Israel	0.415
21	Israel	0.458	21	Israel	0.430	21	Spain	0.402
22	Spain	0.426	22	Norway	0.405	22	Poland	0.362
23	Thailand	0.386	23	Malaysia	0.368	23	Korea, Rep. of	0.344
24	China	0.379	24	Hungary	0.354	24	Brazil	0.310
25	Philippines	0.377	25	Portugal	0.324	25	Portugal	0.309
26	Mexico	0.375	26	China	0.323	26	Turkey	0.306
27	Hong Kong SAR	0.343	27	Brazil	0.321	27	Australia	0.303
28	Portugal	0.342	28	Poland	0.317	28	New Zealand	0.302
29	Poland	0.340	29	Mexico	0.297	29	Barbados	0.296
30	Norway	0.333	30	New Zealand	0.286	30	Hungary	0.285
31	Brazil	0.324	31	Australia	0.285	31	Mexico	0.282
32	Costa Rica	0.318	32	Thailand	0.281	32	Iceland	0.281
33	Turkey	0.309	33	Iceland	0.276	33	Argentina	0.281
34	New Zealand	0.304	34	Argentina	0.272	34	Greece	0.276
35	South Africa	0.299	35	Turkey	0.268	35	Zimbabwe	0.248
36	Australia	0.298	36	India	0.262	36	South Africa	0.246
37	Argentina	0.294	37	Greece	0.262	37	Cyprus	0.245
38	Indonesia	0.292	38	Jordan	0.253	38	India	0.243

Table 1 (cont)

39	Iceland	0.291	39	Barbados	0.251	39	China	0.240
40	India	0.275	40	Uruguay	0.246	40	Malaysia	0.240
41	Greece	0.263	41	Mauritius	0.240	41	Peru	0.238
42	Kuwait	0.258	42	Zimbabwe	0.239	42	Philippines	0.228
43	Jordan	0.253	43	Philippines	0.235	43	Kuwait	0.224
44	Barbados	0.249	44	South Africa	0.232	44	Mauritius	0.221
45	El Salvador	0.247	45	Morocco	0.225	45	Uruguay	0.219
46	Tunisia	0.241	46	Cyprus	0.222	46	Dominica	0.215
47	Mauritius	0.240	47	Pakistan	0.219	47	Thailand	0.213
48	Egypt, Arab Rep.	0.238	48	El Salvador	0.218	48	Trinidad and Tobago	0.209
49	Pakistan	0.235	49	Tunisia	0.213	49	Bangladesh	0.201
50	Uruguay	0.230	50	Syrian Arab Republic	0.213	50	Chile	0.196
51	Cyprus	0.230	51	Reunion	0.211	51	Reunion	0.194
52	Morocco	0.227	52	Egypt, Arab Rep.	0.200	52	Fiji	0.194
53	Trinidad and Tobago	0.217	53	French Guiana	0.199	53	Pakistan	0.192
54	French Guiana	0.217	54	Indonesia	0.199	54	Costa Rica	0.188
55	Zimbabwe	0.213	55	Guatemala	0.193	55	Tunisia	0.187
56	Bangladesh	0.203	56	Dominica	0.193	56	El Salvador	0.186
57	Reunion	0.203	57	Bangladesh	0.192	57	Guatemala	0.184
58	Dominica	0.200	58	Colombia	0.189	58	Colombia	0.179
59	Guatemala	0.200	59	Costa Rica	0.187	59	Yemen	0.179
60	Senegal	0.199	60	Venezuela	0.187	60	Bolivia	0.176
61	Colombia	0.199	61	Fiji	0.187	61	Jordan	0.173
62	Sri Lanka	0.192	62	Chile	0.186	62	Morocco	0.173
63	Saudi Arabia	0.192	63	Saudi Arabia	0.185	63	Senegal	0.167
64	Chile	0.191	64	Haiti	0.183	64	French Guiana	0.162
65	Peru	0.187	65	Martinique	0.177	65	Martinique	0.161
66	Venezuela	0.187	66	Kenya	0.175	66	Kenya	0.156
67	Bolivia	0.181	67	Trinidad and Tobago	0.170	67	Ecuador	0.155
68	Fiji	0.164	68	Peru	0.169	68	Venezuela	0.154
69	Nepal	0.161	69	Senegal	0.166	69	Haiti	0.149
70	Martinique	0.152	70	Kuwait	0.166	70	Oman	0.141
71	Syrian Arab Republic	0.152	71	Seychelles	0.148	71	Jamaica	0.141
72	Algeria	0.145	72	Nepal	0.145	72	Egypt, Arab Rep.	0.133
73	Oman	0.145	73	Jamaica	0.144	73	St. Lucia	0.132
74	Libyan Arab Rep.	0.145	74	Algeria	0.143	74	Malawi	0.119
75	Honduras	0.144	75	Panama	0.141	75	Indonesia	0.119
76	Ecuador	0.137	76	Papua New Guinea	0.138	76	Panama	0.117

Table 1 (cont)

77	Seychelles	0.137	77	Bolivia	0.136	77	Syrian Arab Republic	0.110
78	Jamaica	0.137	78	Malawi	0.132	78	Sri Lanka	0.107
79	Kenya	0.134	79	Sri Lanka	0.131	79	Nicaragua	0.105
80	Haiti	0.132	80	Cameroon	0.131	80	Papua New Guinea	0.104
81	Togo	0.127	81	Ecuador	0.117	81	Saudi Arabia	0.103
82	Papua New Guinea	0.125	82	Oman	0.117	82	Paraguay	0.102
83	Madagascar	0.123	83	Nicaragua	0.114	83	Cameroon	0.099
84	Panama	0.121	84	St. Lucia	0.113	84	Algeria	0.098
85	Nicaragua	0.117	85	Honduras	0.102	85	Central African Republic	0.094
86	Paraguay	0.117	86	Paraguay	0.101	86	Madagascar	0.093
87	St. Lucia	0.114	87	Libyan Arab Rep.	0.098	87	Honduras	0.091
88	Cameroon	0.111	88	Madagascar	0.095	88	Nepal	0.072
89	Malawi	0.105	89	Mali	0.081	89	Togo	0.072
90	Yemen	0.074	90	Togo	0.078	90	Seychelles	0.067
91	Ethiopia (incl. Eritrea)	0.050	91	Central African Republic	0.075	91	Libyan Arab Rep.	0.066
92	Central African Republic	0.043	92	Yemen	0.066	92	Ethiopia (incl. Eritrea)	0.047
93	Mali	0.040	93	Ethiopia (incl. Eritrea)	0.058	93	Mali	0.035

Source: UNIDO Scoreboard database (see Annex for technical notes).

The main question is: why are some countries doing better than others? In general, there seems to be a clear correspondence between industrial performance and the "drivers" mentioned in Section 1.1 at the regional level.

Not surprisingly, industrialized countries do better in all of them, with the largest lead in R&D. In the developing world, East Asia without China has the strongest set of factors, with the exception of FDI per capita and telephone mainlines per 1000 people, where LAC does better in the late 1990s. LAC follows in most variables, but MENA has a higher tertiary technical enrolment rate in 1998. South Asia and SSA (without South Africa) lag significantly behind.

Judging by the results of a regression analysis based on data for 35 countries in 1990 and 51 countries in 2000 (see UNIDO-IDR, 2004); the factors accounted for do seem to influence countries' ability to mount competitive industrial performance. In particular, FDI, R&D and royalties achieve significance in both years. The purchase of technology as measured by royalties and technical payments is positively associated with industrial performance.

Among all these results we wished to emphasize that technological effort is significantly and positively related to CIP, supporting the argument that learning and innovation lie at the core of industrial success.

1.3. Social Capabilities and catch up.

Following the pioneering work of Irma Adelman and Cynthia Morris (1960), later continued by Jonathan Temple and Paul Johnson (1998) we call here "social capabilities" to an amalgam of structural variables (share of agriculture, urbanization, etc), socio-economic characteristics (role of middle class, social mobility, literacy, etc) and the development of mass communications (spread of newspapers, radio, etc) Broadly speaking, we can say that those capabilities become embodied in the society as a result of a combination of policies and institutional arrangements, enhancing it capacity to absorb and manage knowledge and technology.

The whole set of drivers benchmarked by the CIP index in the previous sections seems to point out to the importance of building "social capabilities" across the economy and the society. It looks like this is the main common element underlying a given country capacity to learn and innovate. We understand countries have to build "social capabilities" to effectively participate in global trade and financial flows and to incorporate the technology potentially embodied in them. That is the way countries improve their performance in the CIP index taking real advantage of the mobilization of skills, information and technology to increase growth, improve productivity and catch-up.

Can we further test empirically the direct and increasingly critical importance of knowledge and capabilities for catching-up? This was precisely the aim of a background paper prepared by Fagerberg and Srholec for the last UNIDO Industrial Development Report (IDR, 2005) were they seek to discern trends for a cross-section of 135 countries over the period 1992-2002

They use factor analysis (designed to detect underlying structures in large amount of data) that carries a revision of the 29 indicators on social capabilities[7] When the analysis is completed five principal factors were found, that together explains 76.7% of the variance in income levels. The factors were: knowledge (R&D innovation, scientific publications, ICT infrastructure, ISO certifications and education); inward openness (Correlation between imports and FDI); financial system (market capitalization, country risk and access to credit);

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7 Factor analysis is superior to correlation. The concept of social capabilities then is ultimately more consistent that the drivers.

governance and political system (human rights, functioning of the legal system, protection of property rights, political rights, political constrains, extent of corruption). [8]

Figure 1.2 Social capabilities explaining variance in income levels, with respect to world average GDP per capita, by regions, 2002
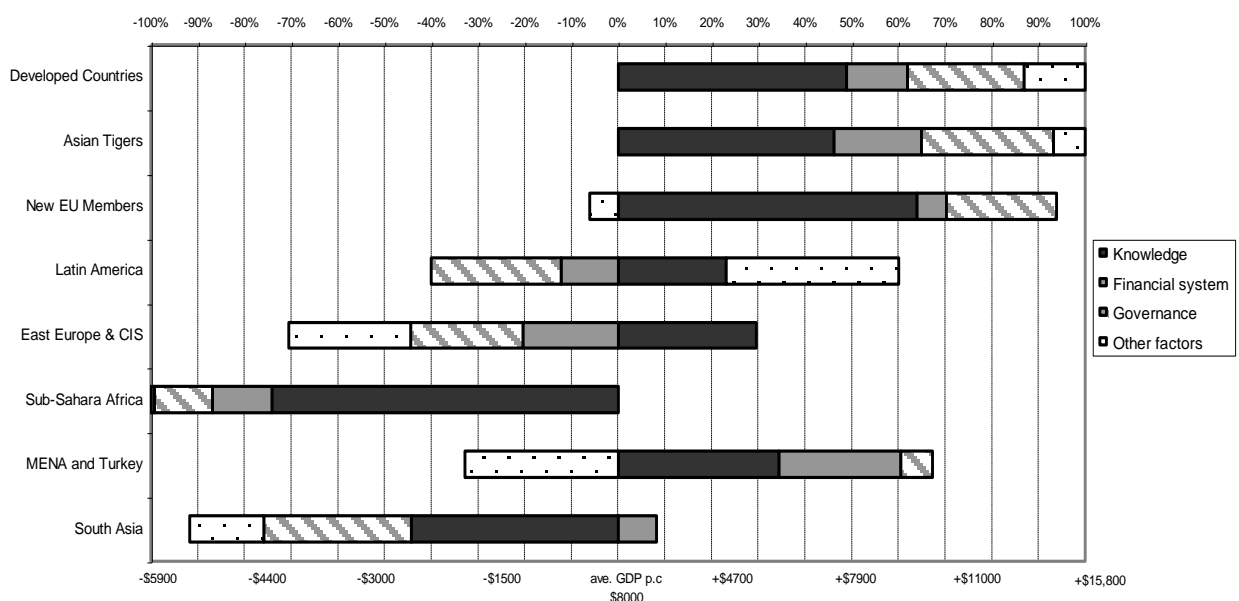
Source: IDR 2005

Using multivariate analysis we can test the relationship between capabilities and current income levels. The regression analysis (useful to summarize the descriptive evidence and test the sensitivity of changing some of the underlying assumptions) is not a test of causality. Arguably, the level of development may influence capability formation. That said, the results give substantial support to the idea that social capabilities — including knowledge, governance and financial structure — are positively and significantly associated with development level. This finding is invariant to changes in factor definitions, estimation techniques and inclusion of additional variables such as geography and history.

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8 It has to be noticed that drivers and social capabilities are both different concepts/indexes , the first was developed in the 2002 IDR by UNIDO; and the second was envisaged in the 2004/2005 IDR (UNIDO) . In this paper an initial attempt is made to reconcile and deepen both indexes, of course this works is risky, still preliminary and very much in progress .

These factors contribute to explain each regions level of development, relative to the world average. As expected, and shown in Figure 1.2, the stock of knowledge seems to be a major source of difference in income levels across regions in 2002. For example, the level of knowledge stock in developed countries accounts for about half of the total difference between their GDP per capita and the overall sample average (in US$ approximately 7900) In other regions like Latin America, Eastern Europe and the Commonwealth of Independent States deficits in complementary assets (financial system, governance) hinders their capacity to take advantage from their relative good stock of knowledge. We can see in Figure1.2 how these five factors together contribute to explain each regions level of development, relative to the world average.

Regarding the relationship between capabilities and economic growth the paper shows that considering both the initial and final periods in the data, the correlation between knowledge stock and level of income stands around 75 per cent — which suggests that the initial level of income is a good proxy for the stock of knowledge. In that context, economic growth should be positively correlated with the _growing_ level of knowledge (assuming as valid the proposition that less developed countries have greater scope for higher growth than the advance ones) and may well be negatively correlated with the _initial_ level of knowledge/income (if it is seen as measuring the potential for catching-up in knowledge, just as GDP per capita)

The expectation that the correlation between initial income (or knowledge) and subsequent growth will be negative has previously been confirmed by many studies and also turns out to be the case in the referred paper — albeit conditionally. Because of a larger scope for imitation, low-income countries should be expected to grow more than two percentage points faster than the rich ones, assuming that other factors are the same. Although the potential for catch-up is there, it requires a great effort by poorer economies to tap into it since the other conditions are not the same. In reality, the developing countries' higher potential for imitation is more than offset by the better financial system, better governance and faster growth of knowledge in the rich countries, so that in the end the difference in GDP per capita between rich and poor countries widens instead of narrowing.

For example, according to Fagerberg and Srholec, when compared with other factors, growth in knowledge base accounts for the largest portion of East Asian economies' GDP per capita growth for the period under analysis (1992-2002)

The main message of this piece of research seems to be that accumulation of knowledge coupled with increases in other capabilities, particularly in governance and finance, stand out as very critical factors in taking advantage of the catching-up potential Furthermore, the model seems to capture quite accurately the qualitative features of growth across regions, and the estimated growth rates are sufficiently close to the observed values.

Therefore, the devise of specific policies in the area of education, training and skills development for example are of the essence both to increase the income level and the rates of growth. We agree with the argument made by Abugattas and Paus (2006) in their paper regarding the importance of the analysis of social capabilities for the formulation of modern, WTO-compatible industrial policies, since most of the elements of traditional policies in the field (including the ones applied in successful catch-up experiences of Asia) are now banned by the current multilateral and regional trade agreements.

As mentioned earlier, from traditional quantitative definitions of industrial policy and related instruments we have moved towards what we consider a more modern approach based on quality elements, suitable for a globalize and dynamic international economy where innovation, knowledge and technical change drives economic growth along with investments. We broaden the scope of industrial policy to incorporate elements of technology and innovation policies aimed at increasing productivity, growth and, in turn, welfare.

We now turn to how we link this analysis with RIAs.

2. Regional integration agreements and Industrial policy

From the traditional perspective of emphasizing physical capital, industrial policies have been forced, by the integration of global trade and financial markets plus the speed of technological change, to modernize and broaden its scope. Nowadays we find industrial policies overlapping frequently with trade and technology policies.

As briefly seen in the previous section, output structure could not be organized independently of trade policies and a good competitive industrial position generally becomes unsustainable without the creation, adaptation and utilization of knowledge.

2.1 Tensions

Accordingly, the historic tension between trade and industrial policies (and to some extent also with technology policies and subsidies for Research & Development) regarding the degree of protection needed by a given economy to create and sustain productive capacities have shifted in modern times towards a much broader framework between market access and policy making freedom. In other terms, between binding policy commitments required to access globalize markets and the need to preserve policy scope to support domestic activities.

Traditional industrial policy tools would aim generally at controlling the changes in relative prices, typically by regulating domestic competition, subsidizing (with loans or regulations) research and development for domestic sectors, imposing tariffs on imports or implementing rules of origin. Those are precisely the sorts of tools that multilateral or regional trade negotiations would intend to ban in exchange for market access.

WTO negotiations and Regional Integration Agreements have been playing a central role to that process, successfully eliminating or restricting the use of a number of traditional policy instruments. This modality has been in growing demand in recent years, notably from 1990.

It goes without saying that the trend towards regional integration is certainly not new. Several Regional Integration Agreements were drafted during the 1970s and even during the 1980s to improve regional links and eventually consolidate national policies at regional levels. The novelty, however, seems to lie in the amount and speed of its proliferation during the last decade and a half; and the fact that major trade partners are increasingly using such modality of trade negotiations (see figure 2.1 below). For example, near two thirds of the Regional Integration Agreements notified to the WTO (and its predecessor arrangements) since 1990 involve the European Union.

Figure 2.1. Regional Integration Agreements notifications to GATT/WTO
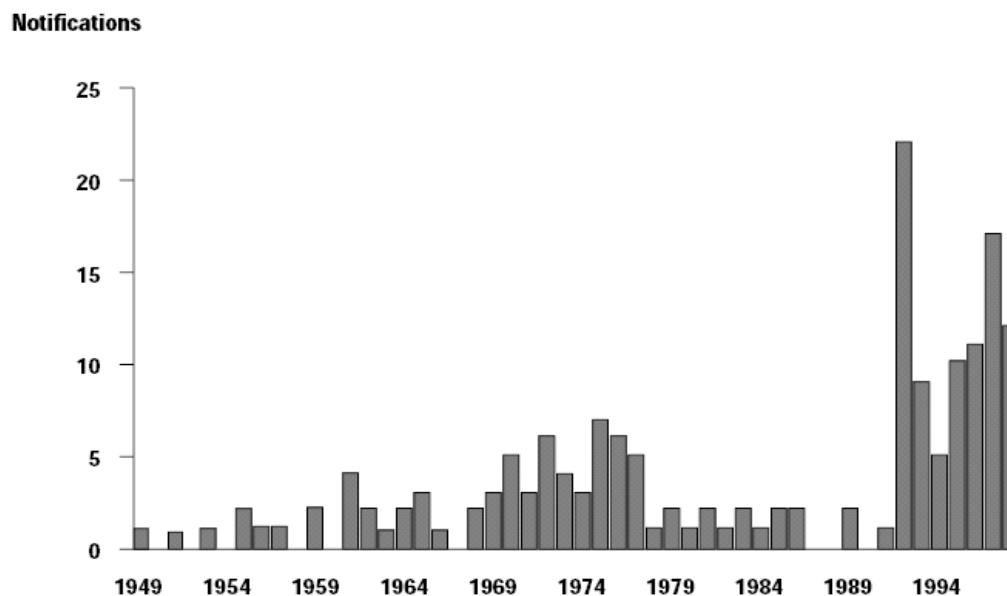
Source: WTO data.

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There is also an important distinction to make regarding this new wave of Regional Trade Agreements. Unlike the first wave of RIA originally drafted during the import-substitution period and organized around an inward looking framework (represented in Latin America by agreements like ALADI, ALALC, Andean Community, Central American and Caribbean Common Market); most of the Regional Integration Agreements of the 1990s and the following years adopted a much more outward oriented approach than its predecessors (exemplified in the same region by MERCOSUR, NAFTA, CAFTA, FTAA, Group of 3 or the South American Union)

The many reasons for this renewed wave of regional agreements range from the importance to reduce military tensions and increase regional security (Mercosur, EU) or the ambition to increase bargaining power (the case of the EU versus US) to the intention to lock-in reforms (NAFTA-México). These are, particularly, in the latter case, made when little progress is achieved in WTO-style multilateral trade talks (usually good framework to do that)

2.2 Connections

Having acknowledged the sources of tension between trade and industrial policies and the important and growing role played by Regional Integration Agreements we need to search, in

the context of this paper, the connection channel between the latter and the former. How and where these connections take place?

It could be argue that Regional Integration Agreements generally influences the economy of the member countries through two basic groups of effects; 1) increasing competition and scale of production; and 2) by shaping trade flows.

Within the realm of the first we need to consider at least three major issues, namely a) the manner in which the competition forces will shape domestic production (production mix and typical plant size); b) the possible market segmentation derived from incomplete integration due to sectoral regulatory framework (i.e. the case of the automobiles sector in Mercosur) and c) the amount and structure of Foreign Direct Investment and its association with the scale of production. The second effect accounts basically for the problem of the creation or diversion of trade flows due to the changes in relative prices generated by the Regional Integration Agreements (Viner 1950) and includes the potential effect of the re-shaped trade flows in Governments revenue.

It is through the combination of these two groups of effects that the regional integration processes and industrial policymaking are connected, influencing the location of productive activities and affecting the levels of employment and real income in partner countries. In turn, these connections will determine gainers and losers and the extent to which an improving of living standards of the population can be expected from this process.

Any attempt at integration implying the organization of common markets for goods and services, regionally or globally, would require a number of sacrifices, efforts and the undertaking of important structural reforms. Policymakers would doubtfully take those decisions in the absence (or at the cost) of popular support. Therefore, to understand when and how these connections work for the betterment of the population of the partner countries is of utmost relevance to predict the likelihood of Regional Integration Processes to proceed and to last. Which are the factors lying behind these connections and governing this process? When will these combinations of effects work to promote convergence between member countries?

To answer these questions we argue that Regional Integration Agreements expose the comparative advantage of partner countries and allow powerful agglomeration (or clustering)

forces, making them the main vehicles driving the relocation of economic activities in general and productive sectors in particular and determining employment and income levels.

The theory of comparative advantage is well known and has a considerable body of work behind it basically describes a leading relocation of industry in response to different factor endowments and associated differences in factor prices. This means that countries with comparative advantage closer to the world average would do better in any Integration Agreement than do countries with more "extreme" comparative advantage (i.e. interposing the "intermediate" country between the "extreme" one and the rest of the world distorts the extremes' country's trade, causing it to switch import supplier. But the intermediate country does not experience this switch in supply: its trade with the "extreme" country and with the rest of the world are less close substitutes, and therefore less vulnerable to trade diversion . (For an illustration of this point see the example of the Kenyan and Uganda integration in Section 3.3 in "Regional Integration and Development" (Shiff and Winters, 2003)).
 This has obvious implications regarding trade creation and diversion. It will also affect the size and structure of the markets and productive sectors of the partner countries and its perspectives to converge or diverge in per capita incomes' terms.

The agglomeration or spacial clustering of economic activities is all-pervasive and can explain the historic tendency of industrial development to proceed in waves. Indeed, this can be verified from the onset of the industrial revolution until the most recent examples of re-industrialization in post-war Europe and Japan or the emergence of the successive waves of Asian Tigers. Such processes are usually governed by a combination of centripetal forces like knowledge spillovers, labor contract pooling and linkages between buyers and sellers that cluster economic activity in certain regions until the costs of congestion, pollution and others of the sort start to pull some economic activities away from the location, generating a centrifugal effect.

In the context of a Regional Integration Agreement, comparative advantage and agglomeration forces could well act in harmony reinforcing a particular relocation tendency for economic activities or pull against each other to influence the outcome of the relocation process in an opposite manner.

Usually, the reduction of trade barriers and the harmonization of related regulation could tip the economic forces in favor of those locations that enjoy a head start. Agglomeration forces

will interact with the set of comparative advantages of each country and it may well reinforce each other. If its so, then, divergence in income per capita will follow. To make matters worse the process might be accelerated by the propensity of FDI to concentrate in relative few locations. In other context, agglomeration forces and comparative advantage could pull against each other, for example, when factor price differences create an incentive to dislocate production from the cluster to a new city or place.

In any case, empirical evidence suggests, as we will examine later, that neither comparative advantage nor agglomeration alone (and nor even the interplay of these two forces) could be expected to get the connections between regional integration effects and industrial policy tools right in order to ensure convergence among the living standards of the members of a Regional Integration Agreement. Additionally, as mentioned before, the fact that most of the traditional industrial policy mechanisms had been left out of the toolbox by successive rounds of multilateral trade talks or by Regional Integration Agreements reduce the policy scope to fight this problem.

2.3 Interactions

There is a third, equally powerful force, playing at the same level of the previous two regarding convergence in income levels and the location of economic activities. It concerns the dissemination of knowledge and technology, eventually embodied in trade and financial flows.

An influential body of work, although according to some not universally accepted, argues that trade and investment flows provide a powerful mechanism for the transfer of knowledge between countries (Coe and Helpman, 1995 and Coe, Helpman and Hoffmaister, 1997)

Statistical analysis attempting to explain the rate of productivity growth in TFP across OECD and developing countries, for example, have shown that foreign knowledge is a significant determinant of the rate of growth of total factor productivity and that for developing countries productivity growth is related to the interaction between openness of the economy (as measured by imports over GDP) and access to foreign knowledge. Thus, to benefit from foreign knowledge an economy must be open in general, but particularly towards those countries which have the largest knowledge stock.

It can be seen these that ideas are very close to the ones explored in our Competitive Industrial Performance Index and our assessment of the critical factors for catching-up regarding the building of social capabilities (Figure 1.2) The difference might lie in the fact that these studies and statistical analysis assume that a country gets access to foreign knowledge in an unspecified manner and in proportion to their imports from countries at the technological frontier while we believe that for that to occur a specific process of capabilities building that relies in a number of drivers and factors must be in place beforehand.

As implied by the CIP index, factor prices could be a good place to start fighting agglomeration forces although they usually represent a poor long-term strategy. A closer look at the sources of productivity gains as well as the building of social capabilities seems to outpace factor price strategies in the long term, as suggested by the recollection made by the last UNIDO IDR of the empirical, historical and policy dimensions of the successful catch-up processes of the last half a century.

Therefore for us, the issue at stake is whether, and under which circumstances, Regional Integration Agreements stimulates the building of social capabilities providing an opportunity to upgrade the identified connection to industrial policies into meaningful and relevant interactions capable of building long lasting comparative advantages and compensating agglomeration forces to forge convergence in income and improve employment levels.

2.4 Two case studies: Mexico in NAFTA and Ireland in the EU.

To address this issue we may need to resort to some examples. It is an area little explored by theory and it will be surely less risky to propose some ideas after visiting at least few real cases. Let's start with a close look at the long-term productivity trends in Mexico, including the period of its membership to NAFTA.

The information is taken from a database on productivity developed by a team led by Anders Isaksson at UNIDO in the context of a project on "Productivity in Developing Countries: Trends and Policies" that covers more than hundred countries including detailed research on productivity performance in an initial sample of 17 developing countries. The sample includes Mexico, Brazil, Argentina and Chile among them.

In the report on Mexico, Enrique Hernández Laos, studied productivity performance between 1960 and the year 2002. To organize his analysis he divided the period in three sub-periods: 1961-81 dominated by an import substitution approach; 1982-87 where macroeconomic instability predominated and 1988-02 dominated by the openness of the economy and, from 1994, by the Integration in NAFTA.

Hernández Laos used several estimates of productivity trends for labor productivity and Total Factor Productivity. Overall labor productivity measures show relatively similar long run trends along the three sub-periods under consideration. (1960-81; 1982-87; 1988-02) These ranged from a sustained increase of 3.2 percent per year between 1961-1981 to a contraction between –0,2 and –4 percent during the crisis period. Finally, there was a slow recovery of between 0,3 and 1,1, percent annually, on average, over the last fifteen years.

In terms of TFP performance and despite differences in both methods applied and the statistical sources, the estimates yield very disappointing results. Even during the rapid economic growth of the ISI period TFP grew either relatively slow, at a rate of 1,1 percent per year or even at a negative rate of –0,4 and –0,7 percent. Throughout the crisis period, all estimates show a systematic collapse of TFP standards, followed by a negative TFP growth between 1988 and 2002.

The estimates of TFP growth, broken down according to pure technical change and efficiency performance (Malmquist method) indicate a disappointing trend in the latter, despite favorable results in terms of technical change during the past decade. Sectoral disaggregating of productivity indexes tend to back up these trends, revealing that the opening of the economy favored the expansion of TFP on traded sectors, mainly in manufacturing. Advances in pure technical change were parallel by sizeable reductions in efficiency in the Mexican manufacturing sector. Furthermore, by using a recursive regression technique, Hernández Laos found that Mexican labor productivity levels followed a dual path vis-a-vis the US: convergent from 1960 to 1981 and divergent from 1982 to 2002.

Would it be this part of the explanation of the spatial agglomeration of investments and economic activities in the northern part of the country with few linkages, if any, with the rest of Mexico? It is evident that despite the impressive growth on exports and the massive increase in Foreign Direct Investments the Mexican economy as a whole has been unable to catch-up as much as could have been expected by the potential of the integration process. Not

even being open to one of the most dynamic technological reservoirs of the world seems to have been enough for them to trigger a convergence process in terms of income levels.

We think that the institutional setting, the slow and difficult building of domestic capabilities and the ensuing functioning of the National System of Innovation accounts at least for part of the explanation of the Mexican failure at drawing more benefits from the enormous potential of its membership to NAFTA

Let's now turn to the case of Ireland and its membership to the European Union. Although we lack an exact replication of the analysis shown for the case of Mexican membership to NAFTA we trust that the data gathered below would allow a meaningful comparison of the cases (see Table 2.1). At the moment of joining the European Union Common Market Ireland was an agrarian economy whose manufacturing sector was very dependent upon the UK for it exports. In the last three decades the situation changed dramatically allowing the Irish economy to become a role model of catch-up around the world and high-tech enclave in the EU.

Although most of the modern growth is accounted for by large foreign firms as is the case in Mexico, unlike them, the indigenous sector has been substantially reshaped, with some of the small and medium size enterprises emerging as dynamic competitors in Europe and the rest of the world markets, specially in the food industry and the services sector.

Both countries, Mexico and Ireland did well in our Competitive Industrial Performance Index and both led their regional performance. Both increased their exports and received massive inflows of FDI.

However Ireland seems to have done better. Mexico advanced just two positions in our index during the 1980s (from the post 31 to 29) and three more over the 1990s (from 29 to 26); while Ireland jumped 10 positions in the 1980s (from 19 to 9) and 7 more in the 1990s (from 9 to 2) in what is probably one of the most impressive performances in the whole sample. Its performance in terms of multifactor productivity growth seems to have been even better.

It clearly seems that Ireland's case provides a better example of long-term, proper interaction between Regional Integration Agreements and industrial policy than does the Mexican case,

showing under which circumstances policies would led positive results in terms of catching-up, building long-term comparative advantages and compensating agglomeration forces.

It could be argue that Ireland has been engaged in the EU Single Market two decades more than Mexico in NAFTA since they joined the EU in 1973 while Mexico entered NAFTA in 1993 and that given sufficient amount of time Mexico will match Irelands results in terms of catching up with the USA. In our view, there is much more than time involved in the process, as we will argue in the next section.

Ireland seems to have done better and progress more in our CIP index, as explained, due to a heavy investment on the drivers benchmarked by it, that greatly influence competitive industrial performance: skills, technological effort, inward FDI, technology licensing and modern infrastructure. Our own perception is that Mexico still has that task ahead. They do know that they have to do it and certainly want to do it, however, the issue of capabilities building has not been address within NAFTA negotiations and no additional source of funds is available.

We don't want to be misunderstood. Mexico membership to NAFTA has been a success story. A story of export growth, productive diversification and technological upgrading due to massive FDI increase. Such membership has been positive for Mexico and enabled it to achieve much more than it would have been otherwise the case. The point we are trying to make is that the results could have been even better, reaching even more segments of the Mexican economy and society if more attention was placed on the institutional infrastructure needed for capabilities building.

The failure to do this is not the necessary attributable to NAFTA negotiations or design. Hungary was in position number 30 in the CIP index in 1980 when México was the number 31 and they were better of than Mexico in the ranking for the year 2000 (position 20 for Hungary versus 26 for México) Malaysia and Thailand were further behind México in 1980 (positions 40 and 47 respectively) and also ended up better off in the year 2000 (positions 15 and 23 respectively versus position 26 for Mexico) The performance of this three countries (Hungary, Malaysia and Thailand) cannot be attributable to its membership to any Regional Integration Agreement in the sense we have attributed the performance of Ireland to the stimulus placed by its membership to the EU. Mexico could have done it without NAFTA as well, just as others countries from different regions did.

On the other hand, it would be wrong to infer that the Ireland's merits lies on its membership to the EU. Other Objective 1 countries (to use the EU terminology) in the European Union also receive structural and cohesion funds without doing so well (Lonardi 2005) The progress of Ireland is certainly due to a myriad of factors among which we would like to highlight at least two: the political determination of Ireland's society to invest in social capabilities and align its institutions to the EU standards and the availability of policy space and funding to do so provided by its membership to the EU.

Perhaps that's the result of a positive interaction between modern industrial policy aimed at building social capabilities and Regional Integration Agreements.

Table 2.1 Long-term productivity trends in Ireland and a group of countries.

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Macroeconomic trends - productivity - multi-factor productivity													
Annual growth in percentage													
Australia	1.0	0.3	1.7	-0.9	0.4	-0.4	1.1	3.3	0.8	0.4	1.3	2.3	2.2
Austria	0.4	1.2	0.6	2.7	2.4	2.1	1.3	0.8	1.1	2.9	1.3	0.4	1.1
Belgium	0.1	0.8	0.4	2.5	2.0	1.6	1.1	0.5	0.9	2.9	1.2	0.2	0.9
Canada	0.4	-1.4	-0.1	0.2	-0.6	-1.1	-1.2	0.7	0.4	1.6	0.7	-0.5	2.7
Denmark	0.1	0.6	-0.7	-1.1	0.9	1.3	1.1	-0.6	2.1	-0.1	2.5	0.3	0.1
Finland	2.4	2.5	2.6	2.4	2.9	0.2	-2.6	0.3	2.7	4.0	1.7	2.6	3.2
France	2.4	1.7	0.8	2.5	2.2	0.7	0.3	1.4	-0.2	1.5	2.1	0.0	1.7
Germany	..	..	..	..	..	..	..	1.5	0.3	2.0	1.6	1.2	1.3
Greece	0.0	0.5	-1.5	2.7	1.8	-1.7	4.0	-2.1	-3.6	1.0	0.9	0.9	3.6
Ireland	**1.8**	**-1.6**	**4.3**	**4.9**	**4.7**	**4.5**	**2.9**	**4.2**	**2.0**	**2.6**	**4.6**	**4.1**	**6.8**
Italy	1.9	1.3	2.0	1.3	1.5	-0.3	-0.6	0.9	1.1	3.4	1.8	-0.3	0.8
Japan	3.8	1.1	2.2	4.4	3.3	3.7	1.4	-0.1	1.0	0.2	1.3	1.4	0.7
Netherlands	-0.3	-0.9	-1.7	2.2	2.4	0.7	1.7	0.8	1.2	2.2	1.6	-1.9	0.7
New Zealand	..	..	..	..	..	-1.1	-0.1	-0.2	2.5	0.5	-0.6	-0.1	0.7
Portugal	..	..	..	..	..	..	..	..	..	..	..	3.3	2.9
Spain	..	..	..	..	..	..	-0.3	1.0	0.5	1.7	0.2	0.4	-0.3
Sweden	0.0	1.3	1.1	-0.6	0.3	-0.8	-0.4	0.4	0.2	2.1	1.4	0.4	2.1
United Kingdom	0.3	2.9	2.0	-1.4	-0.5	-0.2	-0.4	2.0	2.2	2.2	0.9	1.0	0.8
United States	1.6	1.2	0.4	1.5	0.8	0.7	0.3	2.0	0.6	1.5	0.5	2.0	1.1

Source: OECD Factbook 2006: Economic, Environmental and Social Statistics - ISBN 92-64-03561-3 - © OECD 2006

3. Varieties of Regional Integration

We borrow the concept of "varieties of Regional Integration" from Duina (2006) who accepts he is applying to regionalism the idea embodied in the "varieties of Capitalism" approach (Hall and Soskice, 2001) to say that there is certainly many ways to approach these processes and there is not single guidebook to Regional Integration. Different approaches subsist and successful integration could take many forms.

We consider that the institutional set up does make an important difference. Differences in competitiveness arise from different regulatory regimes and organizational arrangements through its impact in interests groups and business. The responses of different groups in different regions vary in line with regional law and overall institutional setting. Duina has shown, for example, that in NAFTA and Mercosur, labor and employment departments have developed international capabilities to oversee the right to form unions and strike, but no so in the EU. Only in the EU, in turn, have those departments developed structures and programs to provide migrant workers from other member states with unemployment benefits.

NAFTA has a much lighter regulatory framework than Mercosur or EU, with a mere fraction of the laws of the two other major blocks (Duina 2004) This would lead us to think that regulation is not necessary for transnational trade to take place. Or perhaps that is necessary when the regional grouping decides to meet certain outcomes. This is certainly an area were future research is needed.

Surely, different Regional Integration Agreements follow different principles and have different overall, long-term objectives. With the Northern Enlargement of 1973 Italy found a strong ally in the UK to get the Union to establish the European Regional Development Fund in 1975, the germ that will subsequently set up the Structural Funds. More important than the funds obtained was the conceptual milestone embodied in that decision.

A decade later the Single European Act of 1986 would acknowledge the importance to help Member States to manage the restructuring pressures imposed on the weaker economies by the adoption of the Single Market 1992 program assisting them in the modernization of their economic system. By adopting such policy they recognized that specific mechanisms were needed by the Union to address the strong "peripherality" (significant distance from core

markets) of countries and regions that stretched from Ireland and Scotland in the north to the Italian Mezzogiorno and Greece in the South and Portugal and Spain in the west.

This resulted in the 1988 Structural Funds Reform and the Delors packages 1 (fixing the spending of the Structural Funds for 1989-93 at 0.29 per cent of EU GDP) and 2 (raising the rate to 0.43 per cent) and the establishment of the Cohesion funds in 1993. All these funds were bound to very clear objectives; Objective 1 policies focus on development of the lagging regions with GDP per capita less that 75 per cent of the EU average; Objective 2 policies originally addressed industrial reconversion problems, largely in the richer Member States; Objectives 3 and 4 meant to address labor market problems (including skills development) and Objective 5b targeted regional problems of little diversified, backward agricultural areas.

Currently this scheme has been simplified around three objectives; to promote development and structural adjustment of regions lagging behind in development; to promote economic and social conversion of areas facing structural difficulties and to modernize education and training systems and employment policies.

It is widely recognized that Ireland took advantage of this funding to upgrade its education system and strengthen skills development while improving its roads network, activities that it would be doubtfully carried out with its own funds under the structural adjustment they had to undertake to join the European Single Market (Artis and Nixson, 2004, Lonardi, 2005 Abugattas and Paus, 2006) They were so successful in the utilization of these mechanisms that are considered to be about to "graduate" from them in the next EU budget cycle.

According to Lonardi (2005) empirical analysis covering the period 1988-1999, shows that Objective 1 regions made significant strides in reducing the per capita income gap with respect to other parts of the Union. The finding is supported by both measures of sigma and beta convergence. There is not an equivalent trend in reduction of the gap between Objective 1 and non Objective 1 regions in terms of rate of unemployment, employment and participation in the workforce. Danny Quah findings regarding the "twin peak" phenomenon of polarization are not present at the EU.

Although sigma convergence remains problematic, beta convergence has shown significant progress. The Objective 1 regions are growing at a faster pace than other regions in Europe

and the rate of convergence compares favorable with convergence rates in the US and within individual Member States since the post-war period. It seems that much of the convergence that took place in the EU area comes form the convergence of the Objective 1 regions. The Commission's Third Cohesion Report confirmed these results.

On the other hand, as mentioned before, the work of Hernández Laos failed to find convergence in productivity levels between Mexico and USA from 1982 to 2002.

Therefore, the institutional setting matters. And matters the most when it comes to secure the policy space and the financial resources to build social capabilities. Countries need to invest in the drivers benchmarked by our CIP index: skills, technological effort, inward FDI, technology licensing and modern infrastructure and the institutional setting of Regional Integration Agreements could help that process a lot, if the subject is negotiated and included among its aims.

From that point of view may be, offering certain policy space for social capabilities building and related funding, could help to get the right interaction between regional trade agreements and modern industrial policy. We guess that if the Free Trade Area of the Americas would have offer similar opportunities to the target countries most probably it would be facing the same queue for membership and the same enthusiasm the EU faces today.

4. Conclusions

It seems clear that integration is very much a political issue, and therefore is politics what determines the level of integration, its characteristics and scope and the goals to be achieved by it. We tried to argue in this paper that a modern industrial policy has to focus on building social capabilities mobilizing skills, knowledge, information and technology to help raise productivity. Regional Integration Agreements and industrial policy could reinforce each other and work in harmony if they are design to do so as exemplified by the case of the Irish membership to the EU.

The relationship between social capabilities and regional integration is complex and rich, full of tensions and interactions. For example; Regional Integration increases FDI and may thus accelerate knowledge acquisition and on the other hand it will reduce policy space, thus making the acquisition of social capabilities harder. This is critical since, without sufficient

social capabilities, divergence seems likely to be the result of regional integration due to the existence of economies of agglomeration.

We feel capable of offering some initial conclusions from the analysis made above.

1. Comparative advantage and agglomeration forces seems to neither guarantee by themselves convergence in productivity or per capita income levels nor suffice to ensure the proper access to knowledge and technology embodied in trade and financial flows. This fact has to be considered while designing Regional Integration Agreements.

2. Countries do get access to knowledge and technology flows in many ways, including through imports, but the necessary condition for it seems to be the conscious building of capabilities in the industrial sector and across the economy.

3. The institutional setting of different Regional Integration Agreements matters and requires special attention in order to ensure a harmonic relationship with the goals envisaged by the partner countries.

4. The existence of cohesion funds in the EU does not provide the deep explanation of Ireland's success. Those funds were equally available, for example, for Greece although the latter achieved very different and less results. Ireland's progress relies in their own ability to assemble the right set of policies, including industrial policies to properly draw from the available funding, grabbing the opportunities and manage the challenges posed by the accession to the EU.

5. However, to do industrial policy countries must have some combination of funding, policy-making freedom and access to the industrial policy toolbox. We have proposed that in the absence of the traditional toolkit, modern industrial policy should aim at building capabilities in the industrial sector and across the economy, mobilizing skills, knowledge, information and technology.

6. To do industrial policy today is much more complex than in the past, both for the evolving character of the task in a globalize world subject to an ever increasing speed of technological change and due to the fact that the process of multilateral negotiations to achieve markets integration has rule out many of the traditional policy tools for industrial policy.

We think that much more research is needed in the field of comparing Regional Integration Agreements and its interaction with modern "capabilities building" industrial policies and just hope this piece of work would trigger some more discussion on the subject.

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Technical Annex

a. How the CPI is built

The CIP index benchmarks competitive industrial activity by countries against the backdrop of liberalization and globalization. As this is difficult to do with one indicator, a combination of four variables is used to capture different aspects of competitive performance. The index has been extended and so differs slightly from the one presented in *IDR 2002/2003*.

1. **Manufacturing value added (MVA) per capita:** This is the basic indicator of a country's level of industrialization, and is deflated by population to adjust for the size of the economy. However, MVA does not capture the competitiveness of manufacturing activity, its role in the national economy or its technological structure; all these need to be taken into account elsewhere in the index. Competitiveness is now critical for sustainable industrial development. The technological structure of production matters insofar as industrial growth and maturity invariably entail a shift of the production structure from simple to complex technologies. Moreover, technologically complex activities offer other benefits: they grow more rapidly in production and trade, they have greater learning potential and beneficial spillovers and they help make economies more responsive to new technological demands. The following variables take these into account.

2. **Manufactured exports per capita:** Exports indicate the ability of countries to produce goods competitively and, implicitly, to keep abreast of changing technologies. Export values cannot, however, capture the extent of local value added and so may give a misleading picture of local manufacturing capabilities when this varies between countries. There is no direct way to adjust for this, but it can be taken into account in analysing the CIP index since the identity of the countries involved in low-value-added assembly is known from other evidence.

3. **Industrialization intensity:** What may be called the 'intensity' of industrialization is measured by the simple average of the *share of MVA in gross domestic product (GDP)* and the *share of medium- and high-technology (MHT) activities in MVA*. The former captures the role of manufacturing in the economy and the latter the technological complexity of manufacturing. The latter variable gives a positive weight

to relatively complex activities, on the ground that these are desirable for competitive performance: a more complex structure denotes industrial maturity, flexibility and the ability to move into faster-growing activities. However, the measure only captures shifts *across* activities and not upgrading *within* them, and so can miss an important aspect of technological improvement. It is also a fairly aggregate measure and does not capture fine technological differences within broadly defined categories (for instance, low-technology activities may include some high-technology products and vice versa). These deficiencies are inherent in the available data, but the findings appear generally sound and plausible.

4. **Export quality:** The 'quality' of exports is viewed as indicated by the simple average of the *share of manufactured exports in total exports* and the *share of MHT products in manufactured exports*. The reasoning is similar to that on industrialization intensity. The share of manufactures in total exports captures the role of manufacturing in export activity, its technological complexity the ability to make more advanced products and to move into more dynamic areas of export growth. Again, there are qualifications to the measure: apart from the problems inherent in classifying products by technology levels, there is the problem, noted above, about the extent of local value added in export activity (an exporter who simply assembles high-technology products appears as sophisticated as one who designs and makes such products with local components if both report the same export values).

Each component of the index is normalised relative to the maximum value achieved in the relevant year, with the highest value given by the best performer in the sample. The normalised scores are then averaged to yield the final CIP index, where no *a priori* weight is attached to any component.

b. Drivers

The five drivers were measured as follows:

- **Skills:** Several skill measures were tried and all yielded very similar ranks. The one finally used was tertiary level enrolments in technical subjects (technical subjects here are science, mathematics and computing, and engineering). All enrolment-based measures suffer from the limitation that they do not capture other forms of skill creation (like on-the-job training) or control for the quality and relevance of formal education. However, in the absence of other measures they are the best available to benchmark countries. Moreover, as *IDR 2002* noted, the rankings they yield are fairly plausible.

- **Technological effort:** Technological effort takes many forms, many of which are informal and diffuse, and so very difficult to measure in practice. The only available measure of technological effort across countries is formal research and development (R&D). While not ideal, R&D does capture a vital element of technological effort even in developing countries: even technology 'followers' have to undertake R&D to absorb complex technologies and use them effectively. The measure used here is R&D financed by productive enterprises (or business enterprise R&D, BERD, in OECD terminology[ii]) rather than total national R&D, as the former gives a better picture of effort relevant to manufacturing competitiveness.

- **FDI:** FDI can provide, apart from capital, several industrial inputs from abroad: new technology, access to international markets, advanced skills, supplier networks, state-of-the-art management techniques, and so on. In recent years, entry into MNC integrated production systems has become an important avenue for export growth in many developing countries. Ideally, the measure should only cover FDI into manufacturing, and within that distinguish export-oriented from domestic-oriented flows. But the FDI data for most countries do not allow such distinctions to be drawn, so the available measure is for total FDI, including investment in services, privatisation, agriculture and so on.

- **Royalties and technical fees:** Overseas payments of royalties and technical fees measure technology imports both via FDI (affiliates paying their parents for new technology) and via arm's-length contracts between independent firms.

- **Modern infrastructure:** There are several possible measures of information and communications technology (ICT) infrastructure, all giving fairly similar rankings. The ones used here are telephone mainlines.

Statistical Annex

Table A.1 Components of CIP index for the core sample, 1980, 1990 and 2000

Country	MVA per capita (dollars)			Manufactured exports per capita (dollars)			Share of medium- and high-tech activities in MVA (percent)			Share of MVA in GDP (percent)			Share of medium- and high-tech goods in manufactured exports (percent)			Share of manufactured goods in total exports (percent)		
	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000
Algeria	226	260	182	88	141	419	24.0	35.3	28.7	9.0	10.4	7.5	3.1	5.6	1.1	12.4	31.9	57.6
Argentina	1634	1164	1335	114	198	370	36.7	37.7	46.3	29.0	26.8	23.1	26.8	23.6	38.5	35.0	52.2	52.1
Australia	2402	2344	2497	519	687	1390	50.6	50.6	49.5	15.3	12.8	13.1	23.3	31.3	41.3	35.1	32.8	43.7
Austria	3390	4320	5174	1972	5158	6477	48.0	50.0	52.9	19.9	20.6	20.6	45.3	53.6	57.3	94.0	95.2	90.1
Bangladesh	34	34	52	7	12	34	25.0	28.3	24.0	15.9	12.7	15.5	1.4	2.4	2.8	85.2	85.6	92.7
Barbados	650	584	564	585	791	656	29.2	24.2	32.2	10.6	8.7	7.5	36.6	25.8	31.5	98.7	95.3	92.1
Belgium	3171	4135	4892	4486	9616	15301	51.4	54.2	55.5	19.4	20.9	20.6	43.7	51.6	56.0	83.0	84.3	85.0
Bolivia	165	126	139	139	79	91	8.6	8.6	11.2	18.4	17.0	16.4	2.3	0.3	28.1	75.9	56.3	55.5
Brazil	880	703	694	75	159	247	47.3	51.6	54.1	27.0	22.5	19.6	30.7	40.0	49.2	62.8	75.1	76.8
Cameroon	106	150	146	2	40	39	18.0	20.7	20.8	10.4	14.2	10.9	5.6	17.1	2.9	21.2	22.5	31.9
Canada	2906	3210	4040	1858	3348	7042	46.4	51.9	57.9	16.4	15.5	16.6	52.7	58.3	59.4	66.7	74.2	78.6
Central African Rep.	39	52	42	15	7	19	18.5	13.5	10.1	6.6	10.4	8.9	0.4	2.8	21.7	31.6	15.5	–
Chile	393	429	578	27	152	398	41.7	42.5	39.0	20.9	18.5	15.3	12.8	15.2	20.0	26.0	24.0	33.8
China	55	113	350	–	42	183	47.4	51.6	57.3	33.0	33.1	34.5	18.5	34.4	45.6	3.1	76.0	92.0
Colombia	211	229	165	33	64	132	27.3	34.1	32.2	20.8	19.9	13.2	19.2	20.6	37.2	31.6	33.1	42.4
Costa Rica	390	363	522	127	161	1005	21.0	23.7	29.0	19.8	19.4	22.2	33.6	27.2	65.5	27.9	33.8	73.8
Cyprus	837	1160	1009	696	606	385	16.0	17.4	21.8	16.9	14.2	9.4	16.3	13.2	30.7	76.1	72.1	77.8
Denmark	3723	4038	4647	2176	4819	6824	47.7	49.3	54.4	16.7	15.6	14.7	47.9	51.5	53.6	71.0	71.2	73.8
Dominica	68	138	147	110	244	432	11.7	12.1	12.4	5.1	5.9	5.3	93.2	72.4	59.3	43.6	32.9	58.1
Ecuador	248	202	201	71	39	95	23.9	20.3	12.7	22.7	19.4	19.9	4.4	4.4	14.6	26.2	14.8	24.9
Egypt, Arab Rep.	98	145	221	15	29	53	32.4	34.0	40.9	15.2	16.9	20.2	2.1	10.2	10.4	20.7	63.3	77.5
El Salvador	250	226	308	64	38	149	21.6	30.6	29.9	21.5	21.7	23.2	30.0	28.2	25.3	30.6	48.0	69.7
Ethiopia	13	12	12	1	1	–	8.1	8.2	9.6	6.8	7.3	6.2	0.2	2.5	0.8	10.2	17.0	12.4
Fiji	189	200	225	319	451	420	12.4	13.8	12.8	10.8	10.5	11.9	1.2	5.9	2.0	96.0	90.5	78.3
Finland	4254	5522	8962	2732	5136	8392	41.3	47.3	55.9	20.2	20.1	27.3	29.2	42.0	55.2	93.2	95.8	95.6
France	3834	4021	4732	1636	3240	4579	51.0	53.9	50.8	21.7	18.8	19.3	54.7	59.2	66.6	87.1	87.7	89.8
French Guiana	1101	539	519	108	271	–	11.7	12.1	12.4	15.4	5.2	5.4	25.6	21.4	71.4	21.5	37.1	52.0
Germany	5835	6618	6414	2042	4665	5932	60.8	66.5	63.2	32.9	30.6	27.2	65.1	68.7	72.0	91.2	93.2	88.9
Greece	1275	1233	1302	327	593	805	35.3	34.5	33.5	15.7	14.9	13.1	17.7	16.9	26.8	74.2	74.7	77.9
Guatemala	171	132	133	52	55	112	31.2	33.9	35.1	16.6	15.0	13.2	34.4	27.6	31.3	24.7	41.5	47.4
Haiti	88	57	21	16	21	6	6.0	5.1	4.8	18.4	15.8	7.1	10.0	14.5	4.1	55.8	85.8	77.3
Honduras	93	91	100	25	20	54	12.4	16.4	12.6	13.8	14.5	15.3	5.9	7.0	24.7	15.0	18.0	32.4
Hong Kong SAR	1702	2131	1458	2739	4843	3212	37.4	41.8	58.5	21.5	16.3	8.7	32.4	40.6	36.8	96.5	95.3	94.9
Hungary	733	839	1377	71	763	2588	55.9	53.9	52.9	24.6	24.3	35.5	63.1	40.9	72.9	8.7	82.4	91.9
Iceland	3934	3522	3948	503	645	1072	24.3	24.1	24.6	18.6	14.2	13.7	21.1	46.0	60.6	12.8	10.4	15.7
India	36	60	90	7	17	38	54.5	55.3	58.4	14.2	16.6	17.4	22.7	17.9	19.7	59.2	79.6	85.8
Indonesia	51	130	216	42	82	224	23.3	30.0	43.4	11.9	20.7	26.5	3.6	10.5	31.3	28.3	58.6	76.9
Ireland	2269	3409	8761	1746	5575	17926	41.2	56.5	72.2	23.3	25.3	27.7	43.5	52.2	59.1	76.3	82.4	89.4
Israel	2320	2576	3344	1270	2355	4681	44.1	52.7	56.1	22.6	21.1	22.7	36.2	41.9	52.8	84.4	88.2	90.0
Italy	3732	4371	4951	1265	2805	3970	56.3	56.9	49.4	23.9	22.5	22.1	45.9	50.5	53.4	94.9	94.1	95.0
Jamaica	287	348	264	85	122	162	22.2	21.5	19.0	18.4	19.4	14.5	11.2	7.7	11.2	18.5	26.1	32.9
Japan	4315	6559	6865	1274	2264	3595	60.6	66.5	68.1	24.7	26.5	25.0	78.9	83.9	85.5	98.0	97.5	95.5
Jordan	195	199	237	114	149	143	17.0	29.5	28.8	13.1	16.1	17.7	25.8	59.1	40.5	49.8	52.4	73.2
Kenya	33	37	34	37	22	19	28.9	24.9	22.4	9.6	10.1	10.3	6.2	27.7	15.3	52.7	51.3	37.7

Korea, Rep. of	658	1699	3434	519	1455	3591	40.8	55.1	64.1	22.8	28.8	35.1	38.9	52.9	70.6	93.4	96.2	98.3
Kuwait	1163	998	2961	1754	221	3464	16.2	6.4	7.5	6.3	11.6	20.0	57.1	54.6	12.5	3.9	6.9	54.6
Libya	284	459	709	19	538	295	16.3	15.6	16.0	2.8	7.9	12.6	9.9	5.7	9.4	5.3	16.7	25.5
Madagascar	42	28	25	6	6	7	13.5	11.2	12.8	13.1	10.9	10.9	6.9	9.8	6.0	17.5	25.4	49.3
Malawi	34	33	25	15	6	6	17.4	32.3	23.3	14.4	17.4	11.1	1.0	10.6	9.1	35.1	13.1	19.1
Malaysia	338	636	1369	413	1287	4121	34.9	52.3	65.1	19.4	26.5	35.9	28.5	50.6	73.3	48.5	78.0	93.3
Mali	17	23	24	2	1	1	6.7	4.7	4.6	5.8	8.1	7.7	0.9	3.2	3.5	4.3	3.0	3.7
Martinique	347	710	459	344	421	–	11.7	12.1	12.4	5.2	7.2	4.5	19.5	27.0	28.5	60.7	54.9	54.3
Mauritius	210	495	784	319	1129	1252	20.1	13.4	13.7	13.8	19.8	20.5	3.1	6.2	4.6	97.5	97.8	97.6
Mexico	600	601	781	35	159	1450	37.6	40.9	42.8	18.5	19.0	20.8	62.0	64.1	76.3	50.7	50.5	86.3
Morocco	161	193	207	49	113	183	29.6	28.7	24.1	17.6	18.4	19.2	9.1	25.9	23.9	41.0	65.8	73.8
Nepal	8	11	24	1	8	22	14.1	12.5	15.6	5.0	5.8	9.6	2.4	0.4	12.1	23.3	85.3	72.4
Netherlands	2963	3532	4087	4062	6986	9937	53.6	56.9	60.0	17.6	17.9	16.6	34.8	47.1	58.8	83.6	79.4	87.6
New Zealand	2328	2281	2546	852	1476	2191	35.4	35.0	44.4	20.1	17.8	17.0	11.2	13.8	18.1	49.8	54.8	65.6
Nicaragua	85	49	44	17	21	30	15.5	13.1	15.4	19.5	16.9	14.6	7.0	9.6	12.1	8.9	24.3	25.0
Norway	3404	3172	3560	2415	3930	4679	55.2	55.4	58.0	15.3	11.7	9.9	38.0	44.3	36.1	54.9	48.9	34.9
Oman	36	192	271	211	260	757	12.9	10.0	14.1	0.8	2.9	3.7	79.6	48.7	54.1	5.1	8.4	17.7
Pakistan	37	56	63	26	45	63	26.6	31.9	35.1	14.1	15.5	15.3	4.3	8.1	9.1	76.6	88.8	98.2
Panama	240	209	232	17	57	98	17.0	19.8	19.8	10.1	9.5	8.1	9.0	17.2	10.9	30.5	40.5	36.3
Papua New Guinea	104	77	103	38	60	267	22.8	17.4	12.8	10.8	9.0	9.9	9.5	36.9	3.8	13.1	22.0	53.4
Paraguay	236	216	178	11	31	51	9.1	10.3	11.5	18.9	17.3	15.3	0.2	8.6	5.9	19.9	13.7	32.1
Peru	537	362	434	47	58	79	43.1	36.1	26.3	29.6	14.9	26.0	11.9	7.8	9.8	34.7	37.8	35.4
Philippines	210	180	188	69	70	482	32.7	31.2	38.3	26.9	24.8	24.2	8.9	30.0	81.8	58.0	52.7	96.2
Poland	1015	743	1397	260	225	734	49.4	47.9	38.7	22.5	22.5	21.0	63.7	49.5	46.4	69.8	63.0	89.7
Portugal	1019	1336	1652	400	1557	2303	33.1	30.7	32.9	19.2	18.7	17.9	24.4	27.3	43.4	93.4	93.8	94.7
Reunion	651	863	862	189	284	–	11.7	12.1	12.4	9.5	10.0	9.0	4.4	11.2	17.4	89.3	92.6	88.7
Saudi Arabia	415	517	555	638	676	761	20.6	52.7	65.3	3.9	7.6	8.7	10.0	16.6	18.7	5.1	23.8	20.0
Senegal	82	102	112	71	65	39	13.5	18.8	34.9	10.9	13.1	13.3	14.9	12.8	21.3	69.8	61.0	59.4
Seychelles	359	532	929	–	149	8	1.4	4.2	4.8	8.6	10.1	15.6	23.0	–	0.1	0.5	75.7	47.2
Singapore	2277	3547	5498	6971	16266	33106	69.5	78.8	87.6	29.7	28.6	28.2	40.5	62.3	78.3	80.3	93.2	96.8
South Africa	729	661	591	139	288	384	51.1	46.4	51.0	21.5	21.5	19.4	32.8	28.8	47.2	19.4	25.7	63.8
Spain	2502	2891	3194	447	1233	2469	45.3	49.4	50.4	24.4	22.1	19.3	41.5	54.8	60.8	82.5	87.2	87.0
Sri Lanka	41	63	123	25	57	177	14.1	11.6	19.1	11.1	13.4	17.4	2.3	5.9	6.7	36.2	51.0	78.0
Sweden	4551	5366	7791	3237	6357	8020	55.2	56.5	66.2	19.7	19.3	24.4	54.7	58.1	65.5	94.4	94.9	91.9
Switzerland	7854	8166	10097	3858	8464	10543	55.1	58.1	59.5	26.6	24.4	29.0	63.6	63.8	66.8	91.2	90.8	92.8
Syrian Arab Rep.	275	393	758	66	166	46	10.5	10.5	9.3	12.4	20.4	29.4	8.6	43.3	6.5	27.2	48.9	15.9
Taiwan, Prov. of China	1450	2571	3971	1207	3149	6564	42.9	52.2	58.6	34.5	32.7	29.6	35.2	51.6	71.2	94.9	95.8	98.3
Thailand	197	424	715	101	339	956	20.6	23.7	42.6	22.6	27.2	34.3	13.1	33.3	58.7	68.0	80.6	87.4
Togo	48	47	46	13	14	16	8.0	10.8	17.1	8.2	9.9	11.4	9.3	6.3	12.9	16.4	18.1	37.8
Trinidad and Tobago	450	360	599	1968	1053	2819	11.7	12.1	12.4	7.6	8.6	11.5	7.4	14.8	14.1	56.6	61.5	85.4
Tunisia	242	255	374	164	330	523	31.1	13.4	22.0	11.8	16.9	18.1	25.0	24.0	24.0	42.1	76.9	84.5
Turkey	367	590	746	39	177	366	36.2	35.9	40.3	14.3	22.0	23.3	25.2	22.4	32.7	–	76.8	88.7
United Kingdom	3282	3542	3696	1336	2655	3976	57.4	60.0	64.3	24.4	20.6	17.9	62.5	67.3	72.2	73.7	82.4	85.5
United States	3527	4084	5306	727	1182	2197	60.4	63.0	63.7	19.3	18.1	18.9	73.9	73.4	75.3	74.2	81.1	88.1
Uruguay	983	837	729	124	311	496	23.0	27.3	20.3	25.9	28.0	19.4	7.8	16.3	20.1	47.1	56.9	72.7
Venezuela	465	503	448	33	127	475	28.6	28.3	35.7	15.7	20.2	18.3	3.6	35.4	12.9	29.8	13.8	37.1
Yemen	66	84	81	5	–	1	10.5	10.5	9.3	8.8	9.6	8.6	11.6	5.7	20.4	–	9.9	2.0
Zimbabwe	181	176	130	67	55	58	37.1	34.9	43.5	22.7	20.5	16.0	49.0	49.2	34.3	37.8	38.6	38.4

Source: UNIDO Scoreboard database (see technical annex).

Table A.2 CIP index and components values for the core sample

Economy	MVA per capia			Manufactured exports per capita			Industrialization intensity			Export quality			CIP Index		
	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000
Algeria	0.029	0.032	0.018	0.013	0.009	0.013	0.272	0.337	0.255	0.079	0.195	0.295	0.098	0.143	0.145
Argentina	0.208	0.143	0.132	0.016	0.012	0.011	0.586	0.530	0.547	0.314	0.405	0.486	0.281	0.272	0.294
Australia	0.306	0.287	0.247	0.075	0.042	0.042	0.534	0.460	0.442	0.297	0.353	0.460	0.303	0.285	0.298
Austria	0.432	0.529	0.512	0.283	0.317	0.196	0.566	0.541	0.554	0.709	0.801	0.786	0.497	0.547	0.512
Bangladesh	0.004	0.004	0.005	0.001	0.001	0.001	0.356	0.317	0.326	0.442	0.448	0.480	0.201	0.192	0.203
Barbados	0.083	0.072	0.056	0.084	0.049	0.020	0.328	0.248	0.275	0.689	0.636	0.646	0.296	0.251	0.249
Belgium	0.404	0.506	0.485	0.644	0.591	0.462	0.585	0.571	0.569	0.644	0.734	0.753	0.569	0.601	0.567
Bolivia	0.021	0.015	0.014	0.020	0.005	0.003	0.266	0.239	0.264	0.399	0.287	0.442	0.176	0.136	0.181
Brazil	0.112	0.086	0.069	0.011	0.010	0.007	0.640	0.571	0.548	0.476	0.618	0.672	0.310	0.321	0.324
Cameroon	0.013	0.018	0.014	0.000	0.002	0.001	0.245	0.285	0.252	0.137	0.216	0.176	0.099	0.131	0.111
Canada	0.370	0.393	0.400	0.267	0.206	0.213	0.516	0.497	0.533	0.607	0.723	0.741	0.440	0.455	0.472
Central African Republic	0.005	0.006	0.004	0.002	0.000	0.001	0.206	0.198	0.166	0.163	0.095	0.000	0.094	0.075	0.043
Chile	0.050	0.053	0.057	0.004	0.009	0.012	0.532	0.470	0.410	0.197	0.212	0.286	0.196	0.186	0.191
China	0.007	0.014	0.035	0.000	0.003	0.006	0.707	0.686	0.749	0.254	0.590	0.727	0.242	0.323	0.379
Colombia	0.027	0.028	0.016	0.005	0.004	0.004	0.427	0.432	0.345	0.258	0.290	0.430	0.179	0.189	0.199
Costa Rica	0.050	0.044	0.052	0.018	0.010	0.030	0.371	0.361	0.437	0.312	0.334	0.753	0.188	0.187	0.318
Cyprus	0.107	0.142	0.100	0.100	0.037	0.012	0.302	0.264	0.239	0.471	0.444	0.569	0.245	0.222	0.230
Denmark	0.474	0.494	0.460	0.312	0.296	0.206	0.528	0.482	0.490	0.605	0.667	0.683	0.480	0.485	0.460
Dominica	0.009	0.017	0.015	0.016	0.015	0.013	0.141	0.141	0.136	0.694	0.598	0.638	0.215	0.193	0.200
Ecuador	0.032	0.025	0.020	0.010	0.002	0.003	0.424	0.339	0.316	0.156	0.101	0.210	0.155	0.117	0.137
Egypt	0.012	0.018	0.022	0.002	0.002	0.002	0.402	0.399	0.480	0.116	0.382	0.449	0.133	0.200	0.238
El Salvador	0.032	0.028	0.031	0.009	0.002	0.004	0.394	0.430	0.454	0.308	0.411	0.497	0.186	0.218	0.247
Ethiopia and Eritrea	0.002	0.001	0.001	0.000	0.000	0.000	0.134	0.131	0.131	0.053	0.101	0.067	0.047	0.058	0.050
Fiji	0.024	0.024	0.022	0.046	0.028	0.013	0.209	0.201	0.219	0.496	0.493	0.404	0.194	0.187	0.164
Finland	0.542	0.676	0.888	0.392	0.316	0.254	0.521	0.518	0.653	0.623	0.735	0.802	0.519	0.561	0.649
France	0.488	0.492	0.469	0.235	0.199	0.138	0.607	0.546	0.526	0.721	0.797	0.839	0.513	0.509	0.493
French Guiana	0.140	0.066	0.051	0.016	0.017	0.000	0.255	0.133	0.137	0.239	0.315	0.678	0.162	0.133	0.216
Germany	0.743	0.810	0.635	0.293	0.287	0.179	0.802	0.754	0.693	0.795	0.881	0.866	0.658	0.683	0.593
Greece	0.162	0.151	0.129	0.047	0.036	0.024	0.428	0.381	0.351	0.468	0.479	0.547	0.276	0.262	0.263
Guatemala	0.022	0.016	0.013	0.008	0.003	0.003	0.408	0.378	0.362	0.300	0.375	0.420	0.184	0.193	0.200
Haiti	0.011	0.007	0.002	0.002	0.001	0.000	0.247	0.204	0.114	0.335	0.521	0.411	0.149	0.183	0.132
Honduras	0.012	0.011	0.010	0.004	0.001	0.002	0.242	0.261	0.259	0.107	0.133	0.306	0.091	0.102	0.144
Hong Kong SAR	0.217	0.261	0.144	0.393	0.298	0.097	0.507	0.442	0.440	0.656	0.724	0.690	0.443	0.431	0.343
Hungary	0.093	0.103	0.136	0.010	0.047	0.078	0.675	0.606	0.736	0.364	0.661	0.886	0.285	0.354	0.459
Iceland	0.501	0.431	0.391	0.072	0.040	0.032	0.381	0.307	0.308	0.172	0.327	0.433	0.281	0.276	0.291
India	0.005	0.007	0.009	0.001	0.001	0.001	0.550	0.531	0.546	0.417	0.509	0.545	0.243	0.262	0.275
Indonesia	0.006	0.016	0.021	0.006	0.005	0.007	0.300	0.415	0.572	0.162	0.359	0.568	0.119	0.199	0.292
Ireland	0.289	0.417	0.868	0.250	0.343	0.541	0.555	0.633	0.751	0.609	0.728	0.793	0.426	0.530	0.738
Israel	0.295	0.315	0.331	0.182	0.145	0.141	0.568	0.563	0.598	0.614	0.696	0.760	0.415	0.430	0.458
Italy	0.475	0.535	0.490	0.182	0.172	0.120	0.670	0.605	0.552	0.716	0.777	0.788	0.511	0.522	0.488
Jamaica	0.037	0.043	0.026	0.012	0.008	0.005	0.364	0.347	0.286	0.151	0.178	0.230	0.141	0.144	0.137
Japan	0.549	0.803	0.680	0.183	0.139	0.109	0.710	0.709	0.694	0.899	0.994	0.978	0.585	0.661	0.615
Jordan	0.025	0.024	0.023	0.016	0.009	0.004	0.268	0.362	0.381	0.385	0.618	0.604	0.173	0.253	0.253

Annex: Statistical tables

Kenya	0.004	0.005	0.003	0.005	0.001	0.001	0.314	0.268	0.254	0.300	0.425	0.278	0.156	0.175	0.134
Korea, Republic of	0.084	0.208	0.340	0.074	0.089	0.108	0.546	0.662	0.795	0.673	0.802	0.905	0.344	0.440	0.537
Kuwait	0.148	0.122	0.293	0.252	0.014	0.105	0.186	0.166	0.287	0.308	0.360	0.347	0.224	0.166	0.258
Libyan Arab Republic	0.036	0.056	0.070	0.003	0.033	0.009	0.148	0.185	0.245	0.077	0.119	0.255	0.066	0.098	0.145
Madagascar	0.005	0.003	0.002	0.001	0.000	0.000	0.242	0.189	0.206	0.124	0.187	0.282	0.093	0.095	0.123
Malawi	0.004	0.004	0.002	0.002	0.000	0.000	0.285	0.394	0.269	0.184	0.129	0.149	0.119	0.132	0.105
Malaysia	0.043	0.078	0.136	0.059	0.079	0.124	0.466	0.619	0.810	0.392	0.696	0.896	0.240	0.368	0.492
Mali	0.002	0.003	0.002	0.000	0.000	0.000	0.113	0.118	0.120	0.026	0.034	0.039	0.035	0.039	0.040
Martinique	0.044	0.087	0.045	0.049	0.026	0.000	0.142	0.155	0.126	0.409	0.439	0.439	0.161	0.177	0.152
Mauritius	0.027	0.061	0.078	0.046	0.069	0.038	0.298	0.300	0.329	0.513	0.532	0.515	0.221	0.240	0.240
Mexico	0.076	0.074	0.077	0.005	0.010	0.044	0.476	0.466	0.499	0.572	0.638	0.878	0.282	0.297	0.374
Morocco	0.020	0.024	0.021	0.007	0.007	0.006	0.408	0.382	0.372	0.256	0.488	0.509	0.173	0.225	0.227
Nepal	0.001	0.001	0.002	0.000	0.001	0.001	0.157	0.142	0.206	0.131	0.434	0.433	0.072	0.145	0.161
Netherlands	0.377	0.433	0.405	0.583	0.429	0.300	0.581	0.555	0.545	0.602	0.683	0.782	0.536	0.525	0.508
New Zealand	0.296	0.279	0.252	0.122	0.091	0.066	0.478	0.415	0.461	0.311	0.359	0.434	0.302	0.286	0.303
Nicaragua	0.011	0.006	0.004	0.002	0.001	0.001	0.328	0.266	0.266	0.081	0.180	0.196	0.105	0.114	0.117
Norway	0.433	0.388	0.353	0.346	0.242	0.141	0.567	0.478	0.452	0.472	0.512	0.386	0.455	0.405	0.333
Oman	0.005	0.024	0.027	0.030	0.016	0.023	0.102	0.095	0.126	0.428	0.333	0.405	0.141	0.117	0.145
Pakistan	0.005	0.007	0.006	0.004	0.003	0.002	0.348	0.371	0.387	0.413	0.498	0.545	0.192	0.219	0.235
Panama	0.031	0.026	0.023	0.002	0.004	0.003	0.234	0.229	0.212	0.201	0.308	0.245	0.117	0.141	0.121
Papua New Guinea	0.013	0.009	0.010	0.006	0.004	0.008	0.284	0.208	0.194	0.115	0.332	0.289	0.104	0.138	0.125
Paraguay	0.030	0.026	0.018	0.002	0.002	0.002	0.275	0.253	0.253	0.103	0.121	0.195	0.102	0.101	0.117
Peru	0.068	0.044	0.043	0.007	0.004	0.002	0.638	0.391	0.468	0.237	0.238	0.235	0.238	0.169	0.187
Philippines	0.027	0.022	0.019	0.010	0.004	0.015	0.533	0.467	0.514	0.341	0.446	0.960	0.228	0.235	0.377
Poland	0.129	0.091	0.138	0.037	0.014	0.022	0.605	0.548	0.478	0.678	0.614	0.720	0.362	0.317	0.340
Portugal	0.130	0.164	0.164	0.057	0.096	0.070	0.451	0.398	0.407	0.600	0.637	0.728	0.309	0.324	0.342
Reunion	0.083	0.106	0.085	0.027	0.017	0.000	0.189	0.185	0.181	0.478	0.535	0.546	0.194	0.211	0.203
Saudi Arabia	0.053	0.063	0.055	0.091	0.042	0.023	0.191	0.417	0.479	0.077	0.219	0.209	0.103	0.185	0.192
Senegal	0.010	0.012	0.011	0.010	0.004	0.001	0.218	0.261	0.362	0.431	0.385	0.422	0.167	0.166	0.199
Seychelles	0.046	0.065	0.092	0.000	0.009	0.000	0.105	0.136	0.218	0.119	0.383	0.237	0.067	0.148	0.137
Singapore	0.290	0.434	0.545	1.000	1.000	1.000	0.829	0.810	0.845	0.614	0.843	0.943	0.683	0.772	0.833
South Africa	0.093	0.081	0.059	0.020	0.018	0.012	0.606	0.528	0.528	0.265	0.302	0.596	0.246	0.232	0.299
Spain	0.319	0.354	0.316	0.064	0.076	0.075	0.596	0.553	0.524	0.631	0.767	0.791	0.402	0.438	0.426
Sri Lanka	0.005	0.008	0.012	0.004	0.003	0.005	0.224	0.219	0.322	0.196	0.293	0.430	0.107	0.131	0.192
Saint Lucia	0.014	0.025	0.018	0.026	0.021	0.003	0.151	0.151	0.133	0.338	0.254	0.303	0.132	0.113	0.114
Sweden	0.579	0.657	0.772	0.464	0.391	0.242	0.616	0.568	0.676	0.758	0.827	0.843	0.604	0.611	0.633
Switzerland	1.000	1.000	1.000	0.553	0.520	0.318	0.691	0.633	0.694	0.787	0.840	0.855	0.758	0.748	0.717
Syrian Arab Republic	0.035	0.048	0.075	0.009	0.010	0.001	0.213	0.288	0.412	0.182	0.506	0.118	0.110	0.213	0.152
Taiwan, Province of China	0.185	0.315	0.393	0.173	0.194	0.198	0.691	0.686	0.696	0.662	0.792	0.909	0.428	0.497	0.549
Thailand	0.025	0.052	0.071	0.015	0.021	0.029	0.399	0.445	0.662	0.413	0.606	0.781	0.213	0.281	0.386
Togo	0.006	0.006	0.005	0.002	0.001	0.000	0.148	0.176	0.237	0.131	0.129	0.264	0.072	0.078	0.127
Trinidad and Tobago	0.057	0.044	0.059	0.282	0.065	0.085	0.168	0.170	0.211	0.327	0.400	0.510	0.209	0.170	0.216
Tunisia	0.031	0.031	0.037	0.023	0.020	0.016	0.354	0.268	0.347	0.341	0.532	0.564	0.187	0.213	0.241
Turkey	0.047	0.072	0.074	0.006	0.011	0.011	0.419	0.466	0.515	0.753	0.522	0.635	0.306	0.268	0.309
United Kingdom	0.418	0.434	0.366	0.192	0.163	0.120	0.683	0.604	0.586	0.692	0.818	0.850	0.496	0.505	0.481
United States	0.449	0.500	0.526	0.104	0.073	0.066	0.649	0.596	0.595	0.752	0.848	0.882	0.489	0.504	0.517
Uruguay	0.125	0.102	0.072	0.018	0.019	0.015	0.453	0.477	0.353	0.280	0.385	0.481	0.219	0.246	0.230

Annex: Statistical tables

Venezuela	0.059	0.062	0.044	0.005	0.008	0.014	0.380	0.399	0.427	0.170	0.280	0.261	0.154	0.187	0.187
Yemen	0.008	0.010	0.008	0.001	0.000	0.000	0.173	0.171	0.158	0.533	0.084	0.130	0.179	0.066	0.074
Zimbabwe	0.023	0.022	0.013	0.010	0.003	0.002	0.519	0.444	0.444	0.441	0.489	0.393	0.248	0.239	0.213

Source: UNIDO Scoreboard database (see technical annex).

Note: The 'industrialization intensity' index, is made-up of MVA as a percentage of GDP and the share of medium and hi-tech activities in MVA. The 'export intensity' index is made-up of manufactured exports as a share of total exports and the share of medium and hi-tech products in manufactured exports.

Annex: Statistical tables

Table A.3   Components of CIP Index for the full sample, 1980, 1990 and 2000

Economy	MVA per capita (dollar)			Manufactured exports per capita (dollar)			Share of medium- and high-tech activities in MVA (percent)			Share of MVA in GDP (percent)			Share of medium- and high-tech goods in manufactured exports (percent)			Share of manufactured goods in total exports (percent)		
	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000	1980	1990	2000
Albania	248	243	84	–	–	74.7	..	..	27.4	34.5	36.9	10.7	..	–	6.6	–	–	89.6
Algeria	226	260	182	87.8	141.4	418.8	24.0	35.3	28.7	9.0	10.4	7.5	3.1	5.6	1.1	12.4	31.9	57.6
Angola	94	54	..	26.7	6.2	..	5.1	6.2	..	8.5	5.0	..	..	–	..	10.1	1.5	..
Antigua and Barbuda	129	203	201	69.0	–	44.4	11.7	12.1	12.4	3.6	3.3	2.4	–	–	1.0	–	–	85.0
Argentina	1 634	1 164	1 335	113.8	198.3	370.1	36.7	37.7	46.3	29.0	26.8	23.1	26.8	23.6	38.5	35.0	52.2	52.1
Armenia	591	654	275	–	–	31.8	52.7	45.3	47.9	35.0	30.3	24.4	–	–	36.0	–	–	61.8
Australia	2 402	2 344	2 497	519.5	687.5	1 389.7	50.6	50.6	49.5	15.3	12.8	13.1	23.3	31.3	41.3	35.1	32.8	43.7
Austria	3 390	4 320	5 174	1 972.4	5 158.0	6 477.4	48.0	50.0	52.9	19.9	20.6	20.6	45.3	53.6	57.3	94.0	95.2	90.1
Azerbaijan	226	230	18	–	–	75.8	..	28.3	35.7	18.6	17.0	6.8	–	–	15.2	–	–	34.9
Bahrain	951	1 367	2 143	538.9	714.2	7 141.2	12.9	10.0	14.1	8.2	16.7	22.1	–	13.0	3.8	–	59.7	74.8
Bangladesh	34	34	52	6.6	12.1	34.1	25.0	28.3	24.0	15.9	12.7	15.5	1.4	2.4	2.8	85.2	85.6	92.7
Barbados	650	584	564	585.2	791.3	656.0	29.2	24.2	32.2	10.6	8.7	7.5	36.6	25.8	31.5	98.7	95.3	92.1
Belarus	726	1 298	1 292	–	–	676.7	..	45.3	47.9	30.9	38.2	30.8	–	–	43.7	–	–	94.0
Belgium	3 171	4 135	4 892	4 486.3	9 616.4	15 300.6	51.4	54.2	55.5	19.4	20.9	20.6	43.7	51.6	56.0	83.0	84.3	85.0
Belize	299	285	361	193.0	491.6	533.5	3.2	4.5	8.7	17.2	13.4	13.3	–	–	0.3	–	87.5	65.0
Benin	37	31	39	2.5	3.1	3.2	8.0	10.8	17.1	9.4	7.8	8.3	–	11.8	19.2	–	–	11.1
Bhutan	4	14	..	1.2	18.5	..	14.1	12.5	..	3.9	8.1	..	–	1.6	..	–	55.1	..
Bolivia	165	126	139	139.3	79.1	91.2	8.6	8.6	11.2	18.4	17.0	16.4	2.3	0.3	28.1	75.9	56.3	55.5
Botswana	85	149	183	–	–	277.1	6.0	11.0	9.4	5.4	4.9	4.7	–	–	9.3	–	–	8.4
Brazil	880	703	694	74.9	159.3	247.4	47.3	51.6	54.1	27.0	22.5	19.6	30.7	40.0	49.2	62.8	75.1	76.8
Bulgaria	640	929	697	–	–	453.6	38.2	41.9	45.8	30.6	39.1	17.4	–	–	30.9	–	–	74.8
Burkina Faso	54	47	66	1.6	–	4.0	6.7	4.7	4.6	15.9	15.3	12.2	41.6	14.0	27.9	15.2	–	25.3
Burundi	19	24	14	1.7	1.0	0.4	4.6	2.8	2.5	10.8	11.8	9.1	–	12.9	5.2	–	–	5.9
Cameroon	106	150	146	2.4	40.3	39.2	18.0	20.7	20.8	10.4	14.2	10.9	5.6	17.1	2.9	21.2	22.5	31.9
Canada	2 906	3 210	4 040	1 857.9	3 347.6	7 041.9	46.4	51.9	57.9	16.4	15.5	16.6	52.7	58.3	59.4	66.7	74.2	78.6
Cape Verde	44	81	94	0.9	–	22.6	21.9	29.1	27.6	6.7	8.2	6.8	5.7	8.7	0.2	26.3	–	98.8

Annex: Statistical tables

Central African Republic	39	52	42	14.6	7.3	19.5	18.5	13.5	10.1	6.6	10.4	8.9	0.4	2.8	21.7	31.6	15.5	–
Chile	393	429	578	26.5	152.2	398.0	41.7	42.5	39.0	20.9	18.5	15.3	12.8	15.2	20.0	26.0	24.0	33.8
China	55	113	350	–	41.6	183.0	47.4	51.6	57.3	33.0	33.1	34.5	18.5	34.4	45.6	32.1	76.0	92.0
Colombia	211	229	165	32.8	64.1	132.1	27.3	34.1	32.2	20.8	19.9	13.2	19.2	20.6	37.2	31.6	33.1	42.4
Comoros	17	20	12	6.9	–	0.3	5.1	6.2	4.3	3.5	4.2	3.5	–	–	13.9	–	–	2.6
Congo, Rep.	66	105	..	34.6	29.3	..	11.1	9.3	..	6.3	8.3	..	3.3	5.5	..	5.3	–	..
Costa Rica	390	363	522	127.0	161.5	1 005.5	21.0	23.7	29.0	19.8	19.4	22.2	33.6	27.2	65.5	27.9	33.8	73.8
Cote d'Ivoire	228	179	183	147.5	–	131.7	12.6	4.7	11.5	19.2	20.9	20.9	7.9	–	8.1	49.2	–	58.7
Croatia	–	–	816	–	902.2	895.1	38.5	40.5	44.2	–	27.7	17.5	–	–	41.9	–	–	94.0
Cuba	287	437	428	26.7	–	77.8	6.0	5.1	4.8	20.3	23.6	28.0	–	–	8.8	–	–	52.0
Cyprus	837	1 160	1 009	695.9	606.5	385.0	16.0	17.4	21.8	16.9	14.2	9.4	16.3	13.2	30.7	76.1	72.1	77.8
Czech Republic	874	834	912	..	1 473.1	2 668.5	55.4	59.0	56.9	33.4	24.6	26.9	65.2	–	56.2	95.1	–	94.4
Denmark	3 723	4 038	4 647	2 175.8	4 819.4	6 823.6	47.7	49.3	54.4	16.7	15.6	14.7	47.9	51.5	53.6	71.0	71.2	73.8
Djibouti	55	39	..	9.1	4.1	..	8.1	8.2	..	4.9	4.6	..	–	9.3	..	–	8.3	..
Dominica	68	138	147	110.3	244.1	431.8	11.7	12.1	12.4	5.1	5.9	5.3	93.2	72.4	59.3	43.6	32.9	58.1
Ecuador	248	202	201	71.4	39.2	95.0	23.9	20.3	12.7	22.7	19.4	19.9	4.4	4.4	14.6	26.2	14.8	24.9
Egypt, Arab Republic	98	145	221	15.3	29.1	53.0	32.4	34.0	40.9	15.2	16.9	20.2	2.1	10.2	10.4	20.7	63.3	77.5
El Salvador	250	226	308	64.1	38.4	148.9	21.6	30.6	29.9	21.5	21.7	23.2	30.0	28.2	25.3	30.6	48.0	69.7
Estonia	1 574	1 667	1 248	–	–	2 428.7	..	46.3	38.9	35.4	35.4	27.7	–	–	47.2	–	–	88.3
Ethiopia (incl. Eritrea)	13	12	12	1.0	1.0	–	8.1	8.2	9.6	6.8	7.3	6.2	0.2	2.5	0.8	10.2	17.0	12.4
Fiji	189	200	225	318.7	450.6	419.8	12.4	13.8	12.8	10.8	10.5	11.9	1.2	5.9	2.0	96.0	90.5	78.3
Finland	4 254	5 522	8 962	2 731.7	5 135.8	8 392.4	41.3	47.3	55.9	20.2	20.1	27.3	29.2	42.0	55.2	93.2	95.8	95.6
France	3 834	4 021	4 732	1 636.2	3 239.6	4 578.5	51.0	53.9	50.8	21.7	18.8	19.3	54.7	59.2	66.6	87.1	87.7	89.8
French Guiana	1 101	539	519	108.2	271.4	–	11.7	12.1	12.4	15.4	5.2	5.4	25.6	21.4	71.4	21.5	37.1	52.0
French Polynesia	601	851	1 077	86.1	208.8	215.6	11.7	12.1	12.4	5.5	5.7	6.2	137.6	–	13.1	45.1	54.5	20.6
Gabon	413	356	324	421.6	–	344.0	17.7	23.1	34.3	5.7	5.6	5.3	13.2	16.4	3.2	17.2	–	16.3
Gambia, The	14	19	15	2.9	–	3.0	5.1	6.2	10.1	3.9	5.5	4.5	–	–	41.9	–	–	23.8
Georgia	361	428	143	–	–	37.7	..	43.5	27.4	21.7	19.2	17.6	–	–	45.7	–	–	60.2
Germany	5 835	6 618	6 414	2 042.1	4 665.1	5 932.0	60.8	66.5	63.2	32.9	30.6	27.2	65.1	68.7	72.0	91.2	93.2	88.9
Ghana	48	38	42	0.6	15.2	27.7	21.9	26.0	27.2	11.1	9.8	9.0	–	10.1	5.7	–	–	50.5

Annex: Statistical tables

Greece	1 275	1 233	1 302	327.0	592.7	804.7	35.3	34.5	33.5	15.7	14.9	13.1	17.7	16.9	26.8	74.2	74.7	77.9
Grenada	46	127	239	75.3	56.0	532.2	11.7	12.1	12.4	3.2	5.2	7.2	–	13.2	28.4	–	23.9	70.8
Guadeloupe	443	422	..	161.4	195.6	..	11.7	12.1	..	6.8	5.9	..	11.6	26.8	..	57.2	62.9	..
Guatemala	171	132	133	52.3	55.2	112.4	31.2	33.9	35.1	16.6	15.0	13.2	34.4	27.6	31.3	24.7	41.5	47.4
Guinea	17	21	20	–	–	9.2	22.2	21.5	19.0	3.3	4.5	3.9	–	2.2	6.4	–	–	17.7
Guyana	120	49	..	299.2	23.3	..	22.2	21.5	..	16.2	9.1	..	3.7	–	..	65.7	–	..
Haiti	88	57	21	15.5	21.2	5.8	6.0	5.1	4.8	18.4	15.8	7.1	10.0	14.5	4.1	55.8	85.8	77.3
Honduras	93	91	100	24.8	20.5	54.0	12.4	16.4	12.6	13.8	14.5	15.3	5.9	7.0	24.7	15.0	18.0	32.4
Hong Kong, Province of China	1 702	2 131	1 458	2 739.4	4 842.9	3 211.6	37.4	41.8	58.5	21.5	16.3	8.7	32.4	40.6	36.8	96.5	95.3	94.9
Hungary	733	839	1 377	70.8	762.6	2 587.7	55.9	53.9	52.9	24.6	24.3	35.5	63.1	40.9	72.9	8.7	82.4	91.9
Iceland	3 934	3 522	3 948	502.6	644.6	1 072.4	24.3	24.1	24.6	18.6	14.2	13.7	21.1	46.0	60.6	12.8	10.4	15.7
India	36	60	90	6.8	16.8	38.5	54.5	55.3	58.4	14.2	16.6	17.4	22.7	17.9	19.7	59.2	79.6	85.8
Indonesia	51	130	216	41.9	82.0	224.0	23.3	30.0	43.4	11.9	20.7	26.5	3.6	10.5	31.3	28.3	58.6	76.9
Iran	168	192	262	11.9	–	36.9	28.5	25.7	9.3	8.1	12.0	13.3	–	–	21.0	–	–	9.3
Ireland	2 269	3 409	8 761	1 745.8	5 575.1	17 926.3	41.2	56.5	72.2	23.3	25.3	27.7	43.5	52.2	59.1	76.3	82.4	89.4
Israel	2 320	2 576	3 344	1 270.1	2 354.7	4 680.6	44.1	52.7	56.1	22.6	21.1	22.7	36.2	41.9	52.8	84.4	88.2	90.0
Italy	3 732	4 371	4 951	1 265.3	2 804.6	3 969.8	56.3	56.9	49.4	23.9	22.5	22.1	45.9	50.5	53.4	94.9	94.1	95.0
Jamaica	287	348	264	84.5	122.2	161.9	22.2	21.5	19.0	18.4	19.4	14.5	11.2	7.7	11.2	18.5	26.1	32.9
Japan	4 315	6 559	6 865	1 274.0	2 263.9	3 595.2	60.6	66.5	68.1	24.7	26.5	25.0	78.9	83.9	85.5	98.0	97.5	95.5
Jordan	195	199	237	114.1	148.5	142.9	17.0	29.5	28.8	13.1	16.1	17.7	25.8	59.1	40.5	49.8	52.4	73.2
Kazakhstan	383	481	324	–	–	119.3	9.6	43.5	27.4	26.3	20.3	20.3	–	–	44.4	–	–	21.6
Kenya	33	37	34	36.9	22.2	19.2	28.9	24.9	22.4	9.6	10.1	10.3	6.2	27.7	15.3	52.7	51.3	37.7
Korea, Rep. of	658	1 699	3 434	519.2	1 455.4	3 591.1	40.8	55.1	64.1	22.8	28.8	35.1	38.9	52.9	70.6	93.4	96.2	98.3
Kuwait	1 163	998	2 961	1 753.7	221.0	3 463.6	16.2	6.4	7.5	6.3	11.6	20.0	57.1	54.6	12.5	3.9	6.9	54.6
Kyrgyzstan	119	156	35	–	–	22.3	9.6	4.7	5.8	25.0	23.2	8.7	–	–	45.0	–	–	24.1
Latvia	1 071	1 530	690	–	–	691.0	49.7	46.3	38.9	29.7	33.2	21.5	–	–	15.0	–	–	89.5
Lebanon	312	160	156	200.3	–	149.4	10.5	10.5	9.3	15.2	13.1	8.1	–	–	27.7	–	–	78.4
Lesotho	15	38	59	–	–	129.8	31.6	42.2	50.3	4.8	10.1	12.8	..	–	12.0	–	–	94.5
Liberia	46	42	..	199.1	2.9	..	12.6	4.7	..	6.5	6.9	..	1.6	–	..	71.3	–	..
Libyan Arab Jamahiriya	284	459	709	19.0	538.4	295.5	16.3	15.6	16.0	2.8	7.9	12.6	9.9	5.7	9.4	5.3	16.7	25.5
Lithuania	722	997	400	–	–	938.9	..	46.3	38.9	30.0	20.9	17.8	–	–	30.5	–	–	91.1

Annex: Statistical tables

Luxembourg	4 317	5 860	6 307	–	–	15 929.9	51.4	54.2	55.5	21.8	20.1	14.0	–	–	40.2	–	–	93.5
Macao	..	..	1 128	2 621.1	4 524.5	4 865.6	17.5	7.1	10.5	..	..	8.0	7.7	5.0	4.1	97.3	98.8	99.9
Macedonia	..	–	434	..	..	546.5	31.8	35.7	35.8	..	..	21.7	–	–	22.8	–	–	84.0
Madagascar	42	28	25	6.3	6.2	7.2	13.5	11.2	12.8	13.1	10.9	10.9	6.9	9.8	6.0	17.5	25.4	49.3
Malawi	34	33	25	14.8	5.6	6.2	17.4	32.3	23.3	14.4	17.4	11.1	1.0	10.6	9.1	35.1	13.1	19.1
Malaysia	338	636	1 369	413.3	1 286.5	4 120.5	34.9	52.3	65.1	19.4	26.5	35.9	28.5	50.6	73.3	48.5	78.0	93.3
Maldives	13	37	51	4.4	–	158.2	12.4	13.8	12.8	4.2	5.4	5.0	..	–	–	–	–	60.4
Mali	17	23	24	1.7	1.1	1.0	6.7	4.7	4.6	5.8	8.1	7.7	0.9	3.2	3.5	4.3	3.0	3.7
Malta	1 620	1 736	2 549	1 289.4	2 722.1	5 552.8	25.9	35.1	49.2	33.3	27.0	26.8	–	63.3	81.1	–	94.8	97.5
Martinique	347	710	459	343.6	421.2	–	11.7	12.1	12.4	5.2	7.2	4.5	19.5	27.0	28.5	60.7	54.9	54.3
Mauritius	210	495	784	319.2	1 129.5	1 251.9	20.1	13.4	13.7	13.8	19.8	20.5	3.1	6.2	4.6	97.5	97.8	97.6
Mexico	600	601	781	34.9	159.4	1 450.4	37.6	40.9	42.8	18.5	19.0	20.8	62.0	64.1	76.3	50.7	50.5	86.3
Moldova	399	627	135	..	..	75.8	..	43.5	27.4	26.5	27.2	16.7	–	–	10.4	–	–	71.3
Mongolia	174	245	201	–	–	48.0	9.6	4.7	5.8	26.6	29.0	5.4	–	–	4.4	–	–	26.4
Morocco	161	193	207	49.1	113.1	183.4	29.6	28.7	24.1	17.6	18.4	19.2	9.1	25.9	23.9	41.0	65.8	73.8
Namibia	201	211	220	–	–	172.9	22.2	21.5	9.4	8.8	11.5	9.9	–	–	19.0	–	–	23.4
Nepal	8	11	24	1.2	8.5	22.3	14.1	12.5	15.6	5.0	5.8	9.6	2.4	0.4	12.1	23.3	85.3	72.4
Netherlands	2 963	3 532	4 087	4 062.4	6 986.1	9 937.0	53.6	56.9	60.0	17.6	17.9	16.6	34.8	47.1	58.8	83.6	79.4	87.6
New Caledonia	687	657	718	1 267.4	1 571.5	1 818.9	12.4	13.8	12.8	5.8	4.4	4.3	98.9	–	3.2	52.9	–	61.5
New Zealand	2 328	2 281	2 546	851.9	1 475.7	2 191.5	35.4	35.0	44.4	20.1	17.8	17.0	11.2	13.8	18.1	49.8	54.8	65.6
Nicaragua	85	49	44	17.3	20.7	29.9	15.5	13.1	15.4	19.5	16.9	14.6	7.0	9.6	12.1	8.9	24.3	25.0
Niger	13	21	19	5.1	–	0.4	6.7	4.7	4.6	2.7	6.6	6.7	13.8	–	46.8	6.3	–	3.3
Nigeria	23	21	18	0.4	1.0	0.6	45.4	25.5	36.7	5.2	5.5	5.0	–	24.5	58.1	–	1.2	0.2
Norway	3 404	3 172	3 560	2 414.9	3 930.2	4 679.4	55.2	55.4	58.0	15.3	11.7	9.9	38.0	44.3	36.1	54.9	48.9	34.9
Oman	36	192	271	211.1	259.9	756.9	12.9	10.0	14.1	0.8	2.9	3.7	79.6	48.7	54.1	5.1	8.4	17.7
Pakistan	37	56	63	25.8	44.7	63.5	26.6	31.9	35.1	14.1	15.5	15.3	4.3	8.1	9.1	76.6	88.8	98.2
Panama	240	209	232	16.5	57.0	98.1	17.0	19.8	19.8	10.1	9.5	8.1	9.0	17.2	10.9	30.5	40.5	36.3
Papua New Guinea	104	77	103	38.3	60.2	267.3	22.8	17.4	12.8	10.8	9.0	9.9	9.5	36.9	3.8	13.1	22.0	53.4
Paraguay	236	216	178	10.6	31.2	50.9	9.1	10.3	11.5	18.9	17.3	15.3	0.2	8.6	5.9	19.9	13.7	32.1
Peru	537	362	434	46.7	58.1	78.9	43.1	36.1	26.3	29.6	14.9	26.0	11.9	7.8	9.8	34.7	37.8	35.4
Philippines	210	180	188	68.9	69.8	482.4	32.7	31.2	38.3	26.9	24.8	24.2	8.9	30.0	81.8	58.0	52.7	96.2
Poland	1 015	743	1 397	260.1	225.4	734.2	49.4	47.9	38.7	22.5	22.5	21.0	63.7	49.5	46.4	69.8	63.0	89.7

Annex: Statistical tables

Country																	
Portugal	1 019	1 336	1 652	399.8	1 556.7	2 303.2	33.1	30.7	32.9	19.2	18.7	17.9	24.4	27.3	43.4	93.4	93.8	94.7
Qatar	2 015	2 093	2 662	1 276.3	1 628.9	5 372.0	12.9	10.0	14.1	7.7	12.9	14.7	–	38.7	12.1	–	20.9	43.0
Reunion	651	863	862	188.6	284.4	–	11.7	12.1	12.4	9.5	10.0	9.0	4.4	11.2	17.4	89.3	92.6	88.7
Romania	660	605	440	–	235.8	418.1	...	43.5	27.4	36.8	36.7	27.0	–	39.4	30.5	–	93.2	90.5
Russian Federation	1 032	1 141	610	–	–	379.3	44.3	46.3	61.0	26.5	27.8	22.2	–	–	26.7	–	–	53.6
Rwanda	72	70	73	0.1	–	0.2	5.1	6.2	4.3	17.6	18.3	11.5	–	–	20.0	–	–	2.2
St. Lucia	107	206	180	184.2	341.3	110.4	11.7	12.1	12.4	6.0	6.8	5.1	9.1	11.1	16.2	57.1	37.2	41.5
St. Vincent and Grenadines	105	135	129	19.0	–	169.9	11.7	12.1	12.4	9.9	7.4	5.5	–	–	4.2	–	–	44.2
Samoa	21	19	..	9.4	17.1	..	12.4	13.8	..	2.2	2.0	..	5.8	4.1	..	14.1	34.2	..
Saudi Arabia	415	517	555	637.6	675.6	760.7	20.6	52.7	65.3	3.9	7.6	8.7	10.0	16.6	18.7	5.1	23.8	20.0
Senegal	82	102	112	70.6	65.1	38.7	13.5	18.8	34.9	10.9	13.1	13.3	14.9	12.8	21.3	69.8	61.0	59.4
Seychelles	359	532	929	0.3	149.5	7.8	1.4	4.2	4.8	8.6	10.1	15.6	23.0	–	0.1	0.5	75.7	47.2
Singapore	2 277	3 547	5 498	6 970.9	16 266.1	33 105.8	69.5	78.8	87.6	29.7	28.6	28.2	40.5	62.3	78.3	80.3	93.2	96.8
Slovakia	–	1 147	726	–	–	2 068.5	52.9	53.8	56.3	–	38.9	22.8	–	–	53.4	–	–	94.0
Slovenia	–	–	2 705	–	3 104.2	4 170.7	42.6	45.3	53.1	–	–	25.8	–	–	53.0	–	–	95.0
Somalia	7	7	..	0.1	0.1	..	14.4	11.3	..	5.1	4.6	..	24.1	–	..	0.6	–	..
South Africa	729	661	591	139.2	287.7	383.7	51.1	46.4	51.0	21.5	21.5	19.4	32.8	28.8	47.2	19.4	25.7	63.8
Spain	2 502	2 891	3 194	446.7	1 233.2	2 468.8	45.3	49.4	50.4	24.4	22.1	19.3	41.5	54.8	60.8	82.5	87.2	87.0
Sri Lanka	41	63	123	24.9	56.6	177.5	14.1	11.6	19.1	11.1	13.4	17.4	2.3	5.9	6.7	36.2	51.0	78.0
Sudan	110	85	108	0.3	0.2	46.5	16.3	13.8	19.4	9.9	8.6	6.6	–	0.1	–	–	–	79.3
Suriname	800	518	395	22.4	31.9	40.7	22.2	21.5	19.0	17.0	12.0	7.7	–	0.1	22.7	–	2.7	4.0
Swaziland	136	319	355	–	–	718.0	1.0	0.4	1.4	16.6	29.2	28.3	–	–	17.0	–	–	74.6
Sweden	4 551	5 366	7 791	3 237.3	6 357.4	8 019.7	55.2	56.5	66.2	19.7	19.3	24.4	54.7	58.1	65.5	94.4	94.9	91.9
Switzerland	7 854	8 166	10 097	3 857.5	8 463.5	10 542.8	55.1	58.1	59.5	26.6	24.4	29.0	63.6	63.8	66.8	91.2	90.8	92.8
Syrian Arab Republic	275	393	758	65.8	166.2	45.6	10.5	10.5	9.3	12.4	20.4	29.4	8.6	43.3	6.5	27.2	48.9	15.9
Taiwan, Province of China	1 450	2 571	3 971	1 207.0	3 148.7	6 563.7	42.9	52.2	58.6	34.5	32.7	29.6	35.2	51.6	71.2	94.9	95.8	98.3
Tajikistan	130	130	39	–	–	15.4	9.6	4.7	5.8	16.0	14.8	13.3	–	–	68.0	–	–	14.0
Thailand	197	424	715	101.2	338.6	956.4	20.6	23.7	42.6	22.6	27.2	34.3	13.1	33.3	58.7	68.0	80.6	87.4
Togo	48	47	46	13.5	14.1	16.0	8.0	10.8	17.1	8.2	9.9	11.4	9.3	6.3	12.9	16.4	18.1	37.8
Tonga	27	61	81	5.6	24.5	4.0	12.4	13.8	12.8	2.5	5.1	5.1	..	–	0.2	–	–	4.6

Annex: Statistical tables

Trinidad and Tobago	450	360	599	1 968.3	1 053.2	2 819.2	11.7	12.1	12.4	7.6	8.6	11.5	7.4	14.8	14.1	56.6	61.5	85.4
Tunisia	242	255	374	163.6	329.7	522.8	31.1	13.4	22.0	11.8	16.9	18.1	25.0	24.0	24.0	42.1	76.9	84.5
Turkey	367	590	746	39.2	177.4	365.7	36.2	35.9	40.3	14.3	22.0	23.3	25.2	22.4	32.7	–	76.8	88.7
Turkmenistan	190	172	106	–	–	411.4	..	28.3	35.7	13.0	9.9	10.4	–	–	1.0	–	–	77.8
Uganda	9	10	23	0.2	–	1.8	8.5	18.4	20.5	5.2	5.3	9.0	–	44.6	34.6	–	–	11.7
Ukraine	750	1 040	410	–	–	237.9	..	45.3	47.9	30.8	34.7	30.2	–	–	49.0	–	–	80.9
UAE	1 168	1 250	..	6 667.4	245.6	..	12.9	10.0	..	3.6	7.5	..	–	17.4	..	–	54.5	..
United Kingdom	3 282	3 542	3 696	1 336.3	2 655.5	3 975.7	57.4	60.0	64.3	24.4	20.6	17.9	62.5	67.3	72.2	73.7	82.4	85.5
Tanzania	21	14	13	3.3	2.4	3.1	21.2	25.0	29.6	12.2	8.5	8.2	–	–	8.8	–	–	20.4
United States	3 527	4 084	5 306	727.0	1 181.8	2 197.1	60.4	63.0	63.7	19.3	18.1	18.9	73.9	73.4	75.3	74.2	81.1	88.1
Uruguay	983	837	729	123.8	310.9	496.2	23.0	27.3	20.3	25.9	28.0	19.4	7.8	16.3	20.1	47.1	56.9	72.7
Vanuatu	19	54	..	2.9	18.4	..	12.4	13.8	..	2.4	5.3	..	8.0	21.6	..	2.1	19.9	..
Venezuela	465	503	448	33.1	127.4	474.6	28.6	28.3	35.7	15.7	20.2	18.3	3.6	35.4	12.9	29.8	13.8	37.1
Yemen	66	84	81	5.4	0.2	1.4	10.5	10.5	9.3	8.8	9.6	8.6	11.6	5.7	20.4	–	9.9	2.0
Zambia	52	58	56	1.6	–	20.4	22.7	23.1	23.7	9.0	12.4	14.7	1.2	16.1	12.5	15.2	–	32.1
Zimbabwe	181	176	130	66.7	55.3	58.4	37.1	34.9	43.5	22.7	20.5	16.0	49.0	49.2	34.3	37.8	38.6	38.4

Source: UNIDO Scoreboard database (see technical annex).

Annex: Statistical tables

Table A.4 Values of 1990 index CIP components and drivers

Variable	No. of observations	Mean	Standard Deviation	Minimum	Maximum
Dependent Variables					
MVA per capita	162	956.0	1 513.0	0.0	8 166.0
Manufactured exports per capita	123	1 123.0	2 278.0	0.1	16 266.0
Share of medium- and high-tech activity in MVA	163	28.0	18.0	0.4	78.8
Share of MVA in GDP	162	16.0	8.7	2.0	39.1
Share of medium- and high-tech exports in manufacturing exports	118	27.0	21.0	0	83.9
Share of manufactures in total exports	109	5.05	30.0	1.2	97.8
Independent Variables					
Skills (Share of tertiary technical enrolment in population) 1985	82	0.003	0.003	0.0001	0.017
FDI per capita 1981-85	74	33.0	74.7	-36.8	563.0
R&D expenditures per capita 1985	39	44.0	62.0	0.1	256.0
Royalty payments per capita 1985	55	14.7	30.2	0.1	191.1
Telephones per capita 1985	86	134.5	166.3	1.0	627.8

Source: UNIDO Scoreboard database 2003/2004 and 2002/2003 (see technical annex).

Table A.5   Values of 2000 index CIP components and drivers

Variable	No. of observations	Mean	Standard Deviation	Minimum	Maximum
Dependent Variables					
MVA per capita	154	1 224.0	1 983.0	12.0	10 097.0
Manufactured exports per capita	152	1 789.0	3 961.0	0.0	33 106.0
Share of medium- and high-tech activity in MVA	154	30.0	19.7	1.4	87.6
Share of MVA in GDP	154	16.0	8.1	2.4	35.9
Share of medium- and high-tech exports in manufacturing exports	153	30.0	23.4	0.05	85.5
Share of manufactures in total exports	153	60.0	30.6	0.24	99.9
Independent Variables					
Skills (Share of tertiary technical enrolment in population) 1998	86	0.004	0.003	0.0001	0.017
FDI per capita 1993-97	86	169.8	342.3	0.1	2 536.0
R&D expenditures per capita 1998	60	117.2	199.0	0.1	859.9
Royalty payments per capita 1998	64	67.0	220.3	0.1	1 683.0
Telephones per capita 1998	86	229.9	223.9	2.7	675.4

Source: UNIDO Scoreboard database 2003/2004 and 2002/2003 (see technical annex).

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[i] See Technical Annex for the major considerations behind and some technical features included in the 'new' performance index.

[ii] The OECD's *STI Scoreboard* (the acronym stands for science, technology and innovation) provides many measures of technological activity in OECD countries. In addition to R&D spending by source, it examines different kinds of R&D (basic, applied, defence, health, ICT and so on), international cooperation in R&D, migration of R&D personnel and students, spread of ICT, the share of medium and high-technology manufacturing and services. It also includes several skill measures, including 'human resources and science and technology', and measures the distribution of the workforce across occupations by science and technology intensity. The European Commission, in *The European Innovation Scoreboard,* benchmarks innovative activity in EU member states and many neighbouring countries. In addition to most of the measures used by the OECD, it also benchmarks innovation by SMEs, innovation finance, and the share of new products in sales. Needless to say, such data are not available for most countries outside the industrialized world, and the UNIDO Scoreboard has to manage with patchy data on R&D financed by productive enterprises.