

by Stephen Redding and Anthony Venables

**Why has globalisation brought such large increases in exports to some countries and not to others? Stephen Redding and Anthony Venables look at the way internal geography and domestic institutions seem to be a large part of the answer.**

# Yawning gaps

**T**here have been wide variations in countries' export performance over the last quarter century. South-East Asian countries have seen their real exports increase by more than 800% since the early 1970s, while those of sub-Saharan Africa have increased by just 70%.

This has raised concerns that, while some countries are benefiting from globalisation, others are at best passed by. We have investigated some of the determinants of these divergent export performances, looking in particular at the roles of external and internal geography.

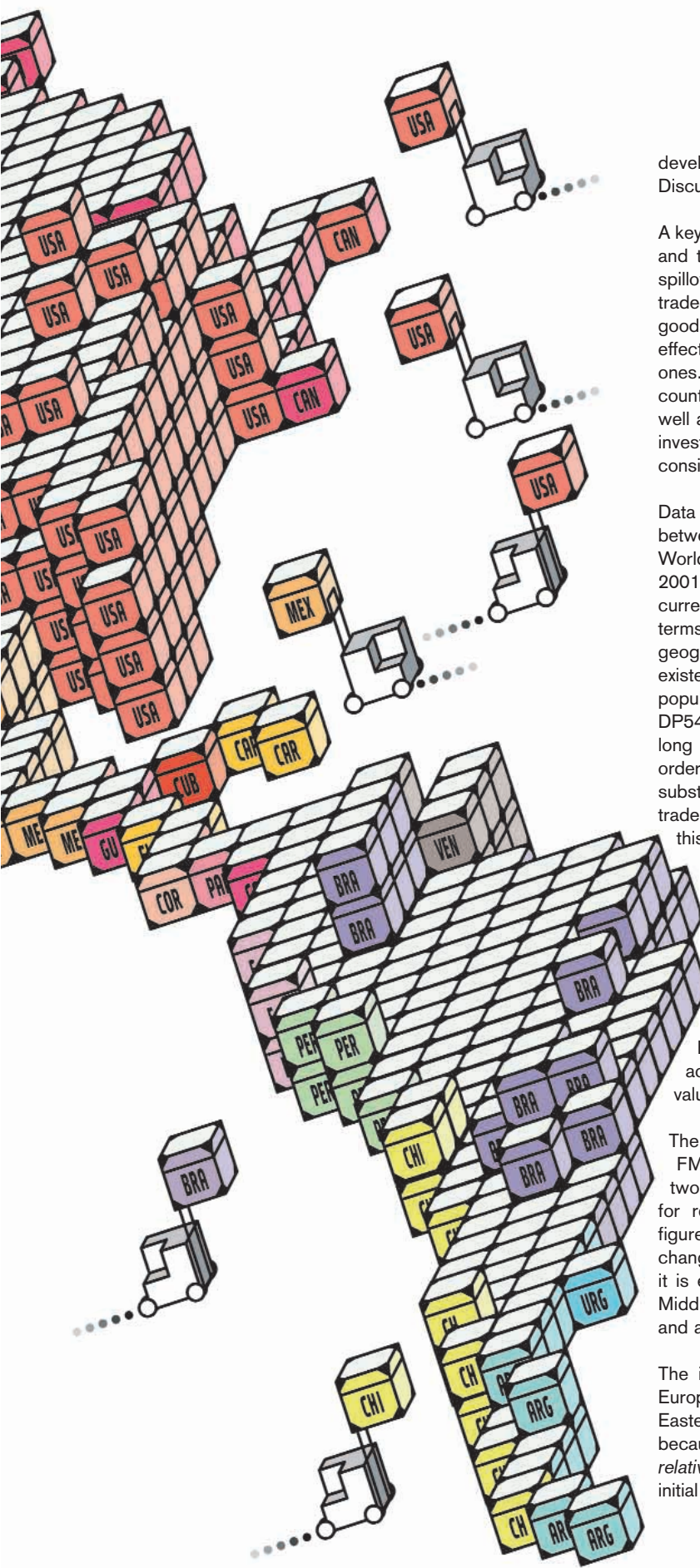
Geography might be expected to affect export performance in several ways. One is that the strength of international demand linkages varies between countries. Countries in South-East Asia have been at the centre of a fast growing region, which has created rising import demand. Given all we know about the importance of distance as a barrier to trade, the export opportunities created by these growing demands are likely to be geographically concentrated, creating spillover effects between countries in the region.

We have developed a theoretical model of bilateral trade flows, using gravity techniques to estimate the model's parameters. This enables us to break down each country's actual export growth into two parts. One is based on a country's location relative to sources of import demands,

which we call its "foreign market access". The other is linked to changes within the country, which we call its "supply capacity". We find that a substantial part of the differential export growth of various countries and regions since 1970 can be attributed to variations in the rate at which their foreign market access has grown.

Changes in one country's foreign market access arise from changes in aggregate import demand from other countries – particularly those that are geographically close. There may also be particular effects arising, for example, from regional integration agreements. We, therefore, refined our model to allow the ease of trading within regions to differ from that between regions. Such intra-regional effects are positive for Europe and negative for sub-Saharan Africa. Also, they have increased significantly over time in North America and Latin America.

In order to investigate the determinants of each country's supply capacity, we developed a simple theoretical framework within which supply capacity depends in equilibrium on a country's internal geography, its business environment (such as institutional quality) and its foreign market access. All three characteristics turn out to be statistically significant and quantitatively important determinants of export performance. For example, almost all of sub-Saharan Africa's poor export performance can be accounted for by poor performance under each heading. (The theoretical model that we



developed and use here is described in full in our Discussion Paper No. 549.)

A key feature of theoretical models of product differentiation and trade costs is the existence of a pecuniary demand spillover across countries. An increase in expenditure on traded goods in one country raises demand for traded goods in other countries and, because of trade costs, this effect is greater for neighbouring countries than for distant ones. This implies that growing import demand in other countries will be an important source of export growth as well as domestic supply-side considerations. We begin by investigating the relative importance of these two sets of considerations.

Data on the value of bilateral trade flows for 101 countries between 1970 and 1997 are obtained from the NBER World Trade Database (Feenstra et al., 1997; Feenstra, 2001). The US GDP deflator has been applied to these current dollar data to obtain a measure of trade flows in real terms. We combined the trade data with information on geographical characteristics (eg bilateral distance, or existence of a common border) and with data on GDP and population from the World Bank. (See Appendix A of DP549 for further details.) We are concerned here with the long run determinants of real export growth. Therefore, in order to smooth year-on-year fluctuations which may be substantial for small countries, we have averaged bilateral trade flows over four-year periods. With 28 years of data, this yields seven periods for analysis.

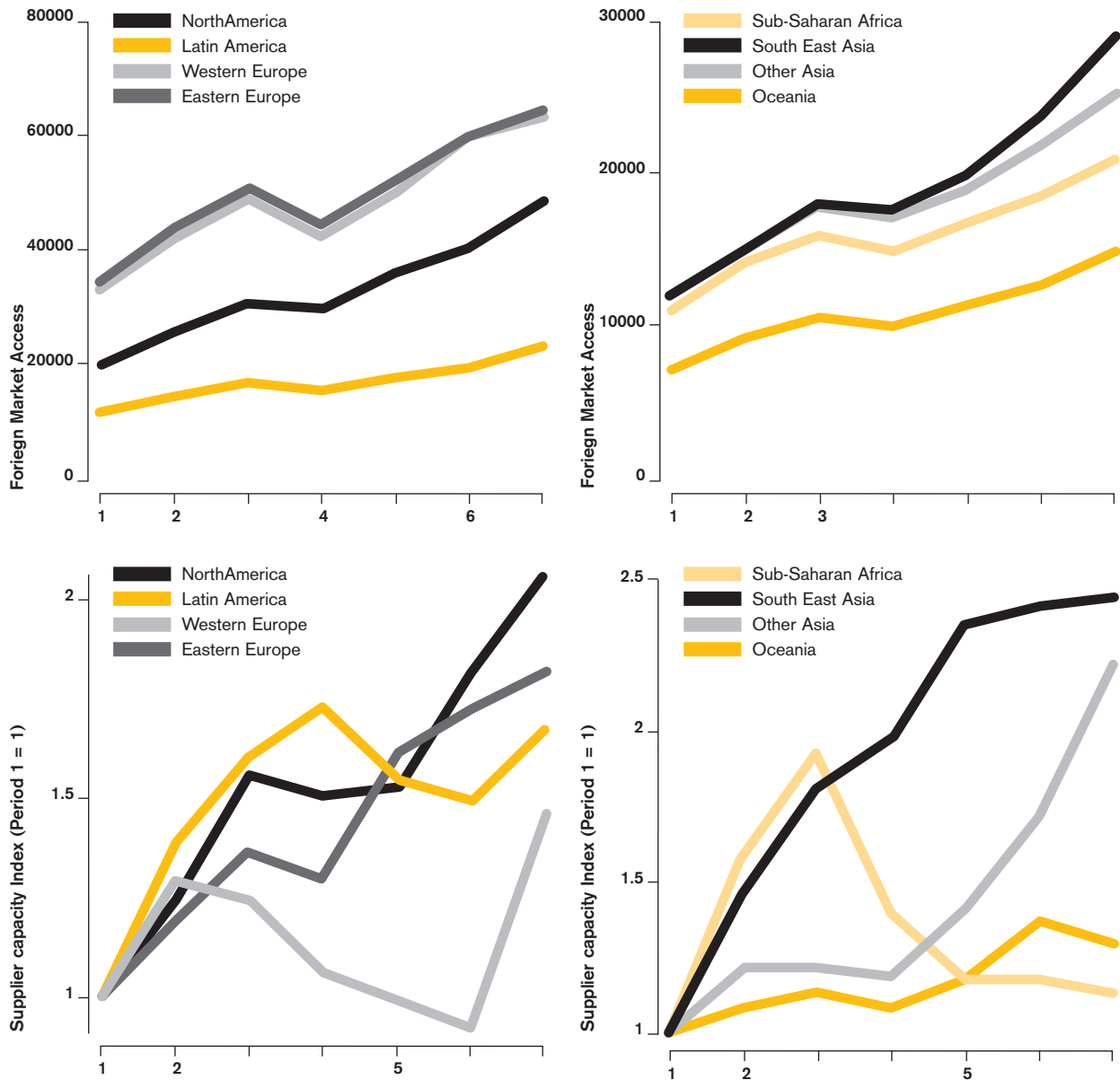
The results of our estimations for all 101 countries are shown in the Appendix to DP549. Here, in order to provide a broader overview of the sources of export growth, we aggregate the results for nine geographical regions: North America; Latin America; Western Europe; Eastern Europe; Sub-Saharan Africa; South-East Asia; "Other" Asia; Oceania; and Middle East and North Africa. A region's foreign market access (FMA) and supplier capacity are the sum of the values for all countries within the region.

The upper two panels of Figure 1 show the evolution of FMA for the first eight of these regions, while the lower two panels show changes in supplier capacity. To control for regions having different numbers of countries, the figure graphs average rather than total values. To clarify changes over time, we normalize supplier capacity so that it is expressed relative to its initial value. The results for Middle-East and North Africa are dominated by oil exports and are, therefore, omitted from the figure.

The initial ranking by regions has Eastern and Western Europe with the highest level of FMA. (This high position for Eastern European is not as surprising as it might seem, because the FMA estimate measures where countries are *relative to world import demands*.) At the bottom of this initial ranking is Oceania. The most striking feature of the

## Export opportunities created by growing import demands are likely to be geographically concentrated

Figure 1. Regional FMA and Supplier Capacity



time trend shown in Figure 1 is the rapid growth in FMA for South-East Asia and the acceleration of “other Asia” in the second period.

Since the observed growth of exports is to be explained by the combination of foreign market access and increase in supply capacity, identifying the size of the FMA factor reveals the extent to which a country’s export growth has been due to its improved internal supply performance rather than changes in external conditions. Table 1 examines the growth rates of FMA and supplier capacity in further detail

for all nine regions (Again, the results for all 101 countries can be found in DP549.) The “benchmark” at the top of the table shows the growth rates in the indicated periods of overall world exports and displays hypothetical values for the growth of foreign market access and supply capacity that would be observed if all countries had an identical export performance.

A number of results stand out. South-East Asian countries experienced much faster export growth than the benchmark in both the first and second halves of the period

under study. In the first half this was driven particularly by supply capacity growth. In the second, FMA growth became relatively more important. The full results show that, for most countries in this region, FMA growth was generally faster in the first half than in the second. For some of the earlier developers (eg Japan, Taiwan and South Korea), supply capacity growth slowed sharply in the second half, while the later developers (eg Philippines, Thailand, Vietnam) experienced a dramatic increase in supply capacity growth in the second half.

The rest of Asia experienced below average export growth in the first half of the period, but this was accounted for by much slower than average supply capacity growth, which more than offset faster than average market access growth.

This was in sharp contrast to the second half of the period, when close to average market access growth was associated with supply capacity growth at twice the benchmark rate, giving export growth nearly twice the overall level.

Latin America shows a different picture. A close to benchmark rate of market access growth in both the earlier and later periods was associated with a close to benchmark supply capacity growth in the first and weak supply capacity growth in the second. Results for the Middle East and North Africa are again dominated by oil exports. For sub-Saharan Africa, taking the whole period together, the contribution of FMA to export growth was nearly 20 percentage points below the benchmark. This suggests that geographical location was important in explaining the

**Table 1.** Regional sources of export growth, 1970/73 - 1994/97  
% rates of growth

Region	Period	Exports	Foreign Market Access	Supplier Capacity	Region	Period	Exports	Foreign Market Access	Supplier Capacity
<b>Benchmark</b>	Periods 1-7				<b>Sub-Saharan Africa</b>	Periods 1-7			
	(1970/73-1994/97)	326.3	106.5	106.5		(1970/73-1994/97)	70.4	86.4	-7.2
	Periods 1-4					Periods 1-4			
	(1970/73-1982/85)	104.4	42.9	42.9		(1970/73-1982/85)	54.2	34.7	10.8
	Periods 4-7					Periods 4-7			
(1982/85-1994/97)	108.5	44.5	44.5	(1982/85-1994/97)	10.5	38.4	-16.3		
<b>North America</b>	Periods 1-7				<b>N Africa/Middle East</b>	Periods 1-7			
	(1970/73-1994/97)	289.0	166.1	110.9		(1970/73-1994/97)	189.8	102.8	41.2
	Periods 1-4					Periods 1-4			
	(1970/73-1982/85)	92.7	59.4	54.0		(1970/73-1982/85)	245.5	48.4	135.7
	Periods 4-7					Periods 4-7			
(1982/85-1994/97)	101.8	66.9	36.9	(1982/85-1994/97)	-16.1	36.7	-40.1		
<b>Latin America</b>	Periods 1-7				<b>SE Asia</b>	Periods 1-7			
	(1970/73-1994/97)	193.3	110.8	48.1		(1970/73-1994/97)	826.2	146.4	238.0
	Periods 1-4					Periods 1-4			
	(1970/73-1982/85)	90.2	40.4	43.5		(1970/73-1982/85)	233.7	47.9	119.0
	Periods 4-7					Periods 4-7			
(1982/85-1994/97)	54.2	50.2	3.3	(1982/85-1994/97)	177.6	66.6	54.4		
<b>Western Europe</b>	Periods 1-7				<b>Other Asia</b>	Periods 1-7			
	(1970/73-1994/97)	269.4	94.3	96.8		(1970/73-1994/97)	372.0	117.8	119.3
	Periods 1-4					Periods 1-4			
	(1970/73-1982/85)	75.1	33.0	34.1		(1970/73-1982/85)	76.5	45.7	21.0
	Periods 4-7					Periods 4-7			
(1982/85-1994/97)	111.0	46.1	46.8	(1982/85-1994/97)	167.5	49.4	81.2		
<b>Eastern Europe</b>	Periods 1-7				<b>Oceania</b>	Periods 1-7			
	(1970/73-1994/97)	187.4	94.8	39.6		(1970/73-1994/97)	166.8	104.3	29.9
	Periods 1-4					Periods 1-4			
	(1970/73-1982/85)	44.0	34.0	11.0		(1970/73-1982/85)	48.4	37.3	7.9
	Periods 4-7					Periods 4-7			
(1982/85-1994/97)	99.6	45.5	25.8	(1982/85-1994/97)	79.9	48.8	20.4		

**Table 2.** % contributions of partner regions to the growth of foreign market access of each exporting region: Periods 1-7 (1970/73-1994/7)

	FMA	North America	Latin America	Western Europe	Eastern Europe	Sub-Saharan Africa	ME/NA	SE Asia	Other Asia	Oceania
North America	166.1	141.4	3.2	9.5	0.3	-0.4	1.3	9.8	0.3	0.6
Latin America	110.8	59.1	19.3	14.0	0.4	-0.9	2.2	14.9	0.6	1.2
Western Europe	94.3	15.5	1.5	62.0	2.0	-0.5	2.9	10.2	0.5	0.4
Eastern Europe	94.8	14.4	1.4	60.7	3.0	-0.6	3.7	11.2	0.6	0.5
Sub-Saharan Africa	86.4	27.2	4.6	23.8	0.8	-2.4	6.0	23.8	1.4	1.3
N Africa/M East	102.8	20.4	2.4	33.0	1.1	-1.1	23.9	20.7	1.7	0.8
SE Asia	146.4	19.1	2.2	13.0	0.5	-0.7	3.4	104.7	1.9	2.3
Other Asia	117.8	21.3	2.7	19.4	0.7	-1.0	7.7	58.4	7.1	1.7
Oceania	104.3	30.0	5.1	13.2	0.4	-1.0	3.2	46.6	1.3	5.5

**Note for Tables 2, 3, 4:**  
A region's foreign market access (FMA) is the sum of the values of FMA for all countries within that region. The exporting region is shown in the rows of the table and the importing partner in the columns.

**Table 3.** % contributions of partner regions to the growth of foreign market access of each exporting region: Periods 1-4 (1970/73-1994/7)

	FMA	North America	Latin America	Western Europe	Eastern Europe	Sub-Saharan Africa	ME/NA	SE Asia	Other Asia	Oceania
North America	59.4	51.6	0.4	2.4	-0.1	-0.2	1.8	3.2	0.3	0.2
Latin America	40.4	27.9	1.4	3.2	-0.2	-0.5	3.1	4.7	0.4	0.4
Western Europe	33.0	7.4	0.0	18.1	-0.3	-0.2	4.2	3.2	0.4	0.1
Eastern Europe	34.0	6.8	-0.0	18.3	-0.4	-0.2	5.2	3.6	0.5	0.1
Sub-Saharan Africa	34.7	12.6	-0.1	6.2	-0.3	-1.0	8.6	7.2	1.1	0.4
N Africa/M East	48.4	9.5	-0.0	10.3	-0.2	-0.3	2.1	6.5	1.4	0.3
SE Asia	47.9	8.5	-0.1	2.9	-0.2	-0.5	4.8	30.2	1.4	0.9
Other Asia	45.7	9.6	-0.1	4.8	-0.3	-0.6	10.7	16.9	4.1	0.6
Oceania	37.3	13.1	-0.2	2.3	-0.2	-0.8	4.5	15.3	1.0	2.4

**Table 4.** % contributions of partner regions to the growth of foreign market access of each exporting region: Periods 4-7 (1982/85-1994/97)

	FMA	North America	Latin America	Western Europe	Eastern Europe	Sub-Saharan Africa	ME/NA	SE Asia	Other Asia	Oceania
North America	67.0	56.4	1.8	4.5	0.3	-0.1	-0.3	4.1	0.1	0.3
Latin America	50.2	22.2	12.8	7.7	0.4	-0.3	-0.6	7.3	0.1	0.5
Western Europe	46.1	6.1	1.1	33.0	1.7	-0.3	-1.0	5.2	0.1	0.2
Eastern Europe	45.5	5.7	1.1	31.7	2.5	-0.3	-1.2	5.7	0.1	0.2
Sub-Saharan Africa	38.4	10.9	3.4	13.1	0.8	-1.1	-1.9	12.3	0.2	0.7
N Africa/M East	36.7	7.3	1.6	15.3	0.9	-0.5	1.9	9.6	0.2	0.4
SE Asia	66.6	7.1	1.6	6.9	0.4	-0.2	-1.0	50.4	0.3	1.0
Other Asia	49.4	8.0	1.8	10.0	0.7	-0.3	-2.1	28.5	2.0	0.8
Oceania	48.8	12.3	3.9	7.9	0.5	-0.2	-0.9	22.8	0.2	2.2



## There may be particular effects from regional integration

of FMA growth both for itself and for Eastern Europe. The striking features for sub-Saharan Africa are the negative contribution of its "own region" effect and the lack of any dominant external source of FMA growth.

The Asian figures illustrate two main points. One is the dominant role of intra-regional linkages with South-East Asia. The other is the growth in the importance of South-East Asia for "other Asia". This reflects partly the general westward expansion of economic activity in the South-East Asia region. Table 3 also interestingly indicates South-East Asia's growing importance for FMA growth in other regions, including Africa.

The model that we have been using assumes that trade frictions between countries are measured simply by distance and whether or not the countries share a common border. It is, of course, possible that the costs of trading within a region differ from those of trading between regions. So we added dummies to the model for whether two countries lie within the same geographical region. This specification allows differences between trade costs on transactions within a region and those between regions to be incorporated into the model in a general way that imposes a minimal degree of structure on the data. We are also able to analyse changes over time and relate these to explicit policy attempts at regional integration, including for example the North Atlantic Free Trade Association (NAFTA) and the European Union.

Over time, we observe a systematic increase in the estimated values of almost all the "within region" effects. The proliferation of Regional Preferential Trade Agreements is clearly having an effect, particularly for North America (which includes Mexico). At the beginning of our sample period we found a negative "within region" effect for North America - perhaps reflecting import substitution in Mexico or economic activity being more widely dispersed within the region than captured in our distance measures - but the estimated coefficient became positive in the period 1990 to 1993, during which NAFTA was signed. However, for South-East Asia the intra-regional effect diminishes sharply through time. This does not reflect diminishing intra-regional trade, but rather the particularly rapid growth of trade with countries outside the region.

In Western Europe, we found a systematic rise in the estimated "within region" effect over time. In Eastern Europe, its value follows an inverted U-shape, rising between the 1970s and 1980s (when COMECON policy was to stimulate trade within the then Soviet bloc) and declining markedly in the 1990s (following the fall of the Berlin wall and the abandonment of the COMECON system of public procurement and trading preferences).

The final stage of the analysis asks what determines a country's supply capacity. Intuitively, we should expect it to depend on a number of underlying characteristics, includ-

region's poor export performance. However, supply capacity also grew less fast than the benchmark in both halves of the period and some positive export growth was achieved in the second half as a result of market access growth offsetting a significant reduction in supply capacity.

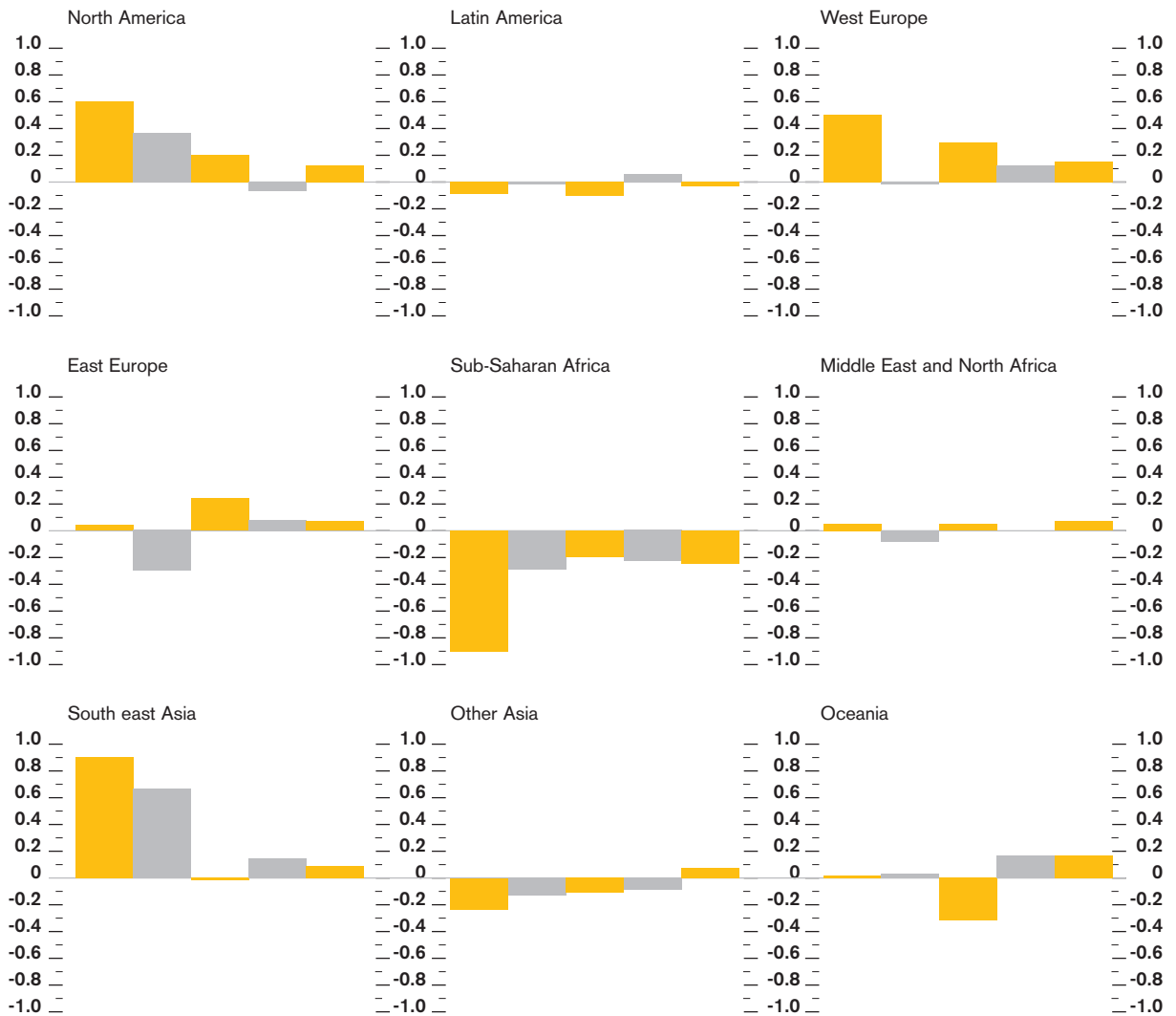
Table 2 looks at each country's foreign market access growth, but does not distinguish the sources of this growth geographically. It would be interesting to know how much of a country's FMA growth came from the performance of other countries in their own region and how much from, say, a growth in North American market capacity?

A country's foreign market access can be divided according to geographical regions in which its markets are located and expressed as the sum of the access to markets in each region. The results for regional groupings are given in Table 2 for the period as a whole and in Tables 3 and 4 for the two halves of the period. Reading across the first row of the tables we see that North America derived virtually all of its FMA growth from itself. This reflects the fact that Canada's FMA is large relative to that of the United States (FMA captures access to markets *other* than one's own) and that the United States constitutes an extremely large share of Canada's FMA. Canada benefits much more from being located close to the USA than the USA benefits from being located close to Canada. Thus the "own region" effect accounts for over 98% of Canada's total FMA growth.

Latin America was much more dependent on FMA growth from outside the region, particularly in the first period. Of these extra-regional sources, North America was by far the most important. Western Europe provided the main source

## South-East Asian countries experienced much faster export growth

Figure 2. Regional export performance, 1994-7



ing size, endowments and internal geography. It will also depend, in equilibrium, on foreign market access, since this is one of the variables that determine the potential return to exporting. Our theoretical approach is described in DP549. The model includes variables for the value of exports, GDP, population and FMA. To represent internal geography we use the percentage of the population living within 100 km of the coast or a navigable river. To capture "institutional quality" we use a widely employed index of the protection of property rights based on the risk of expropriation. We also include a full set of dummy variables for the nine regions to control for unobserved heterogeneity across regions in the determinants of export performance, including institutional differences, technological features and regional characteristics.

To what extent are the divergent performances of the nine regions explained by this model and which of the independent variables are driving the performance of different regions? Our results are shown in Figure 2. The first bar in each box shows the region's export performance relative to the world average after all owing for the effects of country size. The other four bars sum to this first bar, since they represent its four components. Bars three to five in each box show, respectively, the contributions of foreign market access, internal geography, and institutional quality. The second bar represents the residual, after controlling for these factors, ie the regional dummy.

What main points emerge from this analysis? First, North America (including Mexico) has high trade relative to the

## Sub-Saharan Africa has low trade volumes given its income level

world, given its income and population. This is explained partly by relatively good market access and partly by its institutions. This is offset by relatively poor internal geography, leaving a substantial unexplained residual.

Second, Western Europe's high level of exports is accounted for by a combination of good market access, good internal geography and good institutions, leaving virtually nothing to the residual dummy variable. For Eastern Europe, the benefits of good market access and better than average internal geography and institutions are not fully reflected in the actual level of trade, leaving a large negative regional dummy. This is consistent with the idea that the legacy of communism during the post-war period has had a long-lasting effect on Eastern Europe's exports, captured here in the regional dummy.

Third, sub-Saharan Africa has low trade volumes given its income level. These are accounted for by below average performance on all three measures, together with some negative residual. Each of the three factors accounts by itself for between 20% and 30% of sub-Saharan Africa's low overall export growth. Although we are able to explain some of the above average trade ratios in South-East Asia, there remains a substantial positive residual that is likely to be explained in part by the entrepot activities of Hong Kong and Singapore. Finally, the outcome for Oceania combines low market access with good internal geography and institutions.

The changes in countries' export performance since 1970 is symptomatic, at least, of the extent to which they have succeeded in benefiting from globalisation. The real value of world exports doubled between the early 1970s and mid-1980s and doubled again from the mid-1980s to the late 1990s. In the second of these periods Latin American exports went up by just 54%, sub-Saharan Africa's by 10%, while those of the Middle East and North Africa fell by 16%.

We have made some progress in understanding the determinants of cross-country variation in both the levels and growth of exports. We have confirmed that geography creates substantial cross-country variations in the ease of access to foreign markets and is thus an important determinant of export performance. We have shown that a country's export performance also depends on its internal geography and a number of other domestic supply-side factors.

The more we can effectively control for external and internal geographical factors in analysing comparative export performance, the better we shall be able to identify the institutional features that also play a role. Since many of these are subject to policy control, empirical research in this area is of the highest importance.

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This article is based on their paper "Explaining Cross-Country Export Performance: International Linkages and Internal Geography", available from the CEP (Discussion Paper No. 549) or on <http://cep.lse.ac.uk>

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