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South-East Asian export performance: external market access and internal supply capacity ☆

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This paper investigates the determinants of divergent export performance across countries and regions, focusing in particular on South-East Asia. We begin with a general decomposition of export growth into the contributions of increased external demand (foreign market access) and improvements in internal supply-side conditions (supply capacity). Foreign market access growth is shown to make a substantial contribution to explaining divergent export performance and to be highly geographically concentrated. Building on the results of the decomposition, we move on to an econometric analysis of the determinants of export performance, where we find important roles for external geography, internal geography and institutional quality. *J. Japanese Int. Economies* **17** (4) (2003) 404–431. Department of Economics, LSE, Houghton Street, London WC2A 2AE, UK; CEPR, UK.

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1. Introduction

In recent decades South East Asian countries have experienced dramatic rates of export growth. Real export growth was more than 1000% over the period 1970–1997 in China, Hong Kong, South Korea, Malaysia, Singapore, Thailand, Taiwan and Vietnam, with the region as a whole experiencing real export growth of more than 800%. This contrasts starkly for example with the experience of Sub-Saharan Africa, where real exports *fell* over the same period in Ethiopia, Madagascar, Mali, Mozambique, Sudan, Senegal, Tanzania, Uganda, Zaire and Zambia, with the region as a whole experiencing real export growth of around 70%.

This paper examines the determinants of divergent export performance across countries and regions, focusing in particular on South East Asia. These determinants are not only of interest in themselves but, in so far as export growth is thought to influence economic performance more generally, of wider interest in identifying policy priorities nationally and internationally. There is an extensive literature on the links between trade and growth, with for example Sachs and Warner (1995) and Frankel and Romer (1999) presenting evidence of such a relationship, and Rodriguez and Rodrik (2000) and Rodrik et al. (2002) sounding a more cautionary note. The debate has been particularly heated in the context of South-East Asia, where a variety of authors have examined the role of exports in explaining rapid growth, including among others Pack and Page (1994), Rodrik (1994) and World Bank (1993).

The paper begins with a novel decomposition of the growth in countries' exports into the contribution from increases in external demand (foreign market access) and from improvements in internal supply-side conditions (supply capacity). This reveals the extent to which rapid export growth in South-East Asian countries can be accounted for by changes in their own economic performance relative to changes in export markets. The contribution of external demand we term 'foreign market access,' and it is measured using information from a gravity equation. The gravity equation provides measures of the import demand of each country, and of the extent to which any two countries are trading partners. Combining these, we are able to construct the required measure of each country's foreign market access, which we then use as the basis for the decomposition of export growth. The decomposition is extremely general and is consistent with any theoretical model of trade that yields a gravity equation for bilateral trade flows.

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 extent to which their foreign market access has grown. For example, between 1982–1985 and 1994–1997 Japan, Malaysia and Singapore experienced foreign market access growth of over 70%, compared with less than 35% in Benin, Cameron and Sudan. Foreign market access growth is highly geographically concentrated, with South-East Asia making a contribution of 45% towards Japan's 70% foreign market access growth, a contribution of 75% to Malaysia's 87% foreign market access growth, and a contribution of 58% to Singapore's 74% foreign market access growth.

Having separated out the foreign market access and internal supply capacity contributions to export growth, our next objective is to investigate the determinants of each country's internal supply capacity. We develop a simple theoretical structure to show how this

depends on countries' internal geography (such as access to ports), on measures of their business environment (such as institutional quality) and also—in equilibrium—on external geography (foreign market access). The theoretical structure provides the basis for econometric estimation of countries' export performance as a function of these variables, and we find that all three characteristics are significant and quantitatively important. We use our results to explore the performance of different regions, and show how almost all of Sub-Saharan Africa's low level of exports can be accounted for by poor performance in each of these dimensions. In South-East Asia, high levels of exports are explained by a close to world average foreign market access, above world average internal geography and institutional quality, with a substantial positive residual which reflects in part the entrepôt activities of Hong Kong and Singapore.

The paper is organised as follows. Section 2 outlines a theoretical framework, where we show how the gravity equation may be used to decompose total exports into the contributions of foreign market access and internal supply capacity. Section 3 constructs the empirical measures, reports their contributions to export growth and decomposes overall foreign market access growth into the contributions of individual regions. Section 4 endogenises supply capacity in general equilibrium. A simple theoretical framework is developed and provides the motivation for the export equation that we econometrically estimate to establish the effects of foreign market access, internal geography and institutions. Section 5 concludes.

2. Theoretical framework

A key feature of theoretical models of international trade in the presence of product differentiation and trade costs is the existence of a pecuniary demand effect 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, the size of this effect is much greater for neighbouring countries than for distant countries. How much of countries' differential export performances can be accounted for by variation in these demand conditions, and how much by differences in internal supply-side characteristics? Our main task in this paper is to separate out these different forces, and thereby identify the foreign market access and internal supply capacity of each country. (For further discussion of the concepts of foreign market access and internal supply capacity see Redding and Venables, 2003a, 2003b).

Performing this decomposition requires use of bilateral trade information in a gravity model. Gravity models offer an explanation of countries' trade flows in terms of exporter and importer country characteristics and 'between country' information, particularly distance. The gravity model is consistent with alternative theoretical underpinnings (see, for example, Anderson, 1979; Deardorff, 1998; Eaton and Kortum, 2002) and here we start by developing one of them, namely a trade model based on product differentiation derived from a constant elasticity of substitution demand structure (see e.g. Fujita et al., 1999).

The world consists of $i = 1, \ldots, R$ countries whose tradeable goods sectors produce a range of symmetric differentiated products. For the moment we take the range of products produced in each country and their prices as exogenous; Section 5 deals with general

equilibrium. Demand for differentiated products is modelled in the usual symmetric constant elasticity of substitution way; σ is the elasticity of substitution between any pair of products, implying a CES utility function of the form

$$U_j = \left[\sum_i^R n_i x_{ij}^{(\sigma-1)/\sigma} \right]^{\sigma/(\sigma-1)}, \quad \sigma > 1, \tag{1}$$

where n_i is the set of varieties produced in country i; x_{ij} is country j's consumption of a single product variety from this set, and all such varieties are symmetric.

Dual to this quantity aggregator is a price index in each country, G_j, defined over the prices of individual varieties produced in i and sold in j, p_{ij},

$$G_j = \left[\sum_i^R n_i p_{ij}^{1-\sigma} \right]^{1/(1-\sigma)}, \tag{2}$$

where we have again exploited the symmetry of products.

Given country j's total expenditure on differentiated products, E_j, its demand for each variety is (by Shephard's lemma on the price index)

$$x_{ij} = p_{ij}^{-\sigma} E_j G_j^{(\sigma-1)}. \tag{3}$$

Thus, the own price elasticity of demand is σ, and the term $E_j G_j^{\sigma-1}$ gives the position of the demand curve in market j.

We assume that all country i varieties have the same producer price, p_i, and that the cost of delivery to market j gives price $p_{ij} = p_i t_i T_{ij} t_j$. Trade costs thus take the iceberg form, and t_i and t_j are the ad valorem cost factors in getting the product to and from the border in countries i and j, while T_{ij} is the cost of shipping the product between countries. Thus, t_i and t_j capture internal geography, and T_{ij} the external geography of trade flows.

The value of total exports of country i to country j is therefore

$$n_i p_i x_{ij} = n_i p_i^{1-\sigma} (t_i T_{ij} t_j)^{1-\sigma} E_j G_j^{\sigma-1}. \tag{4}$$

This equation for bilateral trade flows provides a basis for estimation of a gravity trade model. The right hand side of this equation contains both importer and exporter country characteristics. The term $E_j (G_j/t_j)^{\sigma-1}$ is country j '*market capacity*'; it depends on total expenditure in j, on internal transport costs t_j, and on the number of competing varieties and their prices, this summarised in the price index. On the supply side, the term $n_i (p_i t_i)^{1-\sigma}$ measures what we refer to as the '*supply capacity*' of the exporting country; it is the product of the number of varieties and their price competitiveness, such that doubling supply capacity (given market capacities) doubles the value of sales. We will denote market capacity and supply capacity by m_i and s_i, respectively, so

$$m_i \equiv E_i (G_i/t_i)^{\sigma-1}, \qquad s_i \equiv n_i (p_i t_i)^{1-\sigma}. \tag{5}$$

From (4), bilateral trade flows can be expressed simply as the product of exporter supply capacity, importer market capacity, and the term $(T_{ij})^{1-\sigma}$ which measures bilateral transport costs between them:

$$n_i p_i x_{ij} = s_i (T_{ij})^{1-\sigma} m_j. \tag{6}$$

Empirically, supply capacity will capture all observed and unobserved characteristics of an exporting country i which affect its bilateral trade with all importers. Similarly, market capacity will capture all observed and unobserved characteristics of an importing country j which affect its bilateral trade with all exporters.

We are concerned with each country's overall export performance, i.e. the value of its exports to all destinations, denoted V_i. This can be decomposed between supply capacity and foreign market access by noting that

$$V_i = n_i p_i \sum_{j \neq i} x_{ij} = s_i \sum_{j \neq i} (T_{ij})^{1-\sigma} m_j = s_i M_i, \tag{7}$$

where M_i is the '*foreign market access*' of country i,

$$M_i \equiv \sum_{j \neq i} (T_{ij})^{1-\sigma} m_j. \tag{8}$$

This is simply the sum of the market capacities of all other countries j, weighted by the measure of bilateral trade costs of reaching each country.

Analogous to foreign market access is the concept of '*foreign supplier access*,' S_i, defined as the sum of the supply capacity of all other countries, weighted by the measure of bilateral trade costs in obtaining goods from each individual supplier j,

$$S_i \equiv \sum_{j \neq i} (T_{ij})^{1-\sigma} s_j. \tag{9}$$

This measures proximity to sources of export supply, and the total value of imports of country i, Z_i, is the product of its market capacity and foreign supplier access,

$$Z_i = m_i S_i. \tag{10}$$

Given observed values of total exports and imports, V_i and Z_i, and values of bilateral trade costs, $(T_{ij})^{1-\sigma}$, for R countries, Eqs. (7)–(10) comprise a system of $4R$ equations in $4R$ unknowns (m_i, s_i, M_i, and S_i for all i). Solving these gives the required decomposition.[1] In particular, we can find each country's supply capacity, s_i, and foreign market access, M_i, giving the decomposition of exports that we seek, $V_i = s_i M_i$. However, doing this requires that we have values of bilateral trade costs, $(T_{ij})^{1-\sigma}$, as well as exports and imports, and it is to this that we now turn.

3. Sources of export growth: decomposition

3.1. Data sources and gravity estimation

Estimates of bilateral trade costs are derived from gravity estimation. We use data on the value of bilateral trade flows for 101 countries during the period 1970–1997, obtained from the NBER World Trade Database (Feenstra et al., 1997; Feenstra, 2001). Since we

[1] Beginning from initial values for m_i, s_i, M_i, and S_i, we repeatedly solve the system of four equations in (7)–(8) for all R countries. Irrespective of initial conditions, the system rapidly converges to unique equilibrium values of m_i, s_i, M_i, and S_i.

Table 1
Bilateral trade equation estimation (country, partner dummies)

$\ln(X_{ij})$	1	2	3	4	5	6	7
Obs.	9981	9981	9981	9981	9981	9981	9981
Period	1970–1973	1974–1977	1978–1981	1982–1985	1986–1990	1990–1994	1994–1997
$\ln(dist_{ij})$	−0.831	−0.866	−0.882	−0.883	−0.853	−0.866	−0.866
	(0.072)	(0.062)	(0.059)	(0.061)	(0.05)	(0.05)	(0.046)
$bord_{ij}$	0.532	0.494	0.483	0.449	0.528	0.607	0.688
	(0.179)	(0.157)	(0.154)	(0.16)	(0.146)	(0.151)	(0.152)
Country dummies	yes	yes	yes	yes	yes	yes	yes
Partner dummies	yes	yes	yes	yes	yes	yes	yes
Estimation	WLS	WLS	WLS	WLS	WLS	WLS	WLS
$F(\cdot)$	96.56	106.83	124.23	128.43	172	198.71	212.87
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.863	0.85	0.852	0.844	0.897	0.906	0.898
Root MSE	0.879	0.89	0.891	0.954	0.761	0.7	0.723

Notes. Huber–White heteroskedasticity robust standard errors in parentheses. $\ln(X_{ij})$ is log bilateral exports from country i to partner j plus one; $\ln(dist_{ij})$ is log bilateral distance between countries i and j; $bord_{ij}$ is a dummy for whether the two countries share a common border. All specifications include exporting country and importing partner fixed effects. Observations are weighted by the product of country and partner GDP.

are concerned with the growth in the real value of countries' exports, the current dollar data in the NBER World Trade Database are deflated by the US GDP deflator to obtain a measure of real trade flows. A country's market and supplier access depend on its trade with all other countries, and these trade data have the advantage of being available for a large cross-section of countries. It is likely that there are substantial year-on-year fluctuations in bilateral trade flows—particularly for small countries—and we are concerned here with the determinants of long-run real export growth. Therefore, in the empirical analysis that follows, bilateral trade flows are averaged over 4-year periods. With 28 years of data, this yields 7 periods of analysis. See Appendix A for further details.

To obtain measures of bilateral trade costs we estimate the gravity Eq. (6) which implies a relationship between bilateral trade, supplier capacity and market capacity. The equation is estimated using bilateral distance and a dummy for whether countries share a common border. Supplier capacity and market capacity are controlled for respectively using an exporter country and importer partner dummy.[2] The estimation results are summarized in Table 1, and we take the predicted values for bilateral trade costs from this equation as our measures of trade costs: thus, $(\widehat{T}_{ij})^{1-\sigma} = dist_{ij}^{\hat{\theta}} \cdot \exp[\hat{\gamma}\, bord_{ij}]$, where $dist_{ij}$ is the distance between a pair of countries i and j, and $bord_{ij}$ is a dummy variable that takes the value one if the two countries share a common border.

[2] This specification is more general than the standard gravity model, in which country and partner dummies are replaced by income and other country characteristics. In particular, the importer partner dummies capture variation in the manufacturing price index G that is a determinant of market capacity m, and this specification thus controls for what Anderson and Van Wincoop (2003) term 'multilateral resistance.' For a recent survey of alternative approaches to estimating the gravity equation, see Feenstra (2002).

3.2. Export growth decompositions

We are now in a position to decompose each country's total exports into the contributions of supplier capacity and foreign market access. The measures of trade costs derived above are combined with data on countries' total imports and exports to solve the system of simultaneous Eqs. (7)–(10) for all countries' market capacities, supply capacities, foreign market access, and foreign supplier access. As a consequence, the product of each country's supply capacity and foreign market access exactly equals its actual exports (and analogously on the import side in Eq. (10)), permitting an exact decomposition of actual exports.[3] This decomposition is extremely general. Although we derived $V_i = s_i M_i$ from a precise theoretical model, this decomposition holds for any theoretical model which yields a gravity equation of the form in Eq. (6), where bilateral trade is explained by exporting country effects, importing partner effects and bilateral trade costs.

We begin by examining the evolution of foreign market access and supplier access. To provide a broad overview, we aggregate countries to 9 geographical regions: Eastern Europe, Latin America, Middle East and North Africa, North America, Oceania, South-East Asia, Other Asia, Sub-Saharan Africa, and Western Europe. Thus, $R(k)$ denotes the set of countries in region k, and the foreign market access (FMA) of the region is simply the sum $M_{R(k)} \equiv \sum_{i \in R(k)} M_i$. Similarly, the supply capacity of the region is the sum of values for individual countries. Figure 1 displays the evolution of regional FMA, while Fig. 2 graphs the time-series of supply capacity. To control for regions having different numbers of countries, the figure graphs average values rather than totals. To clarify changes over time, we normalize supplier capacity so that it is expressed relative to its initial value.

At the beginning of the sample period, Eastern and Western Europe have the highest levels of FMA. The Eastern European position is not as surprising as it first seems, because of its proximity to the countries of Western Europe. These regions are followed by North America. Looking at the upper right panel (and noting the vertical scale) the initial ranking then proceeds as SE Asia, Latin America, Other Asia, Sub-Saharan Africa, and Oceania. The obvious features over time are the rapid growth of SE Asia and the acceleration of Other Asia in the second half of the sample period.

Turning now to export growth, the proportionate growth rates of supply capacity and foreign market access compound to the observed growth rate of exports.[4] Intuitively, the decomposition of export growth into these two components reveals the extent to which

[3] An alternative approach would be to use the estimates of the exporter country and importer partner dummies obtained from the gravity equation as measures of market capacity and supply capacity. This approach was used in another context by Redding and Venables (2003a) but, for the present purposes, has the disadvantage that the decomposition of *total* exports into foreign market access and supply capacity would not then be exact. The correlation across countries and over time between the measure of foreign market access constructed from solving the system of equations for total exports/total imports and the measure based on estimated exporter and importer dummies from the gravity equation is 0.99. The corresponding correlations for market capacity and supplier capacity are 0.98.

[4] Since $V_i = s_i M_i$, $(1 + g_i^V) = (1 + g_i^s)(1 + g_i^M)$, where g is a proportional growth rate. When we aggregate to the regional level, this decomposition is no longer exact since

$$\sum_{i \in R_k} V_i = \sum_{i \in R_k} s_i M_i \neq \sum_{i \in R_k} s_i \sum_{i \in R_k} M_i .$$

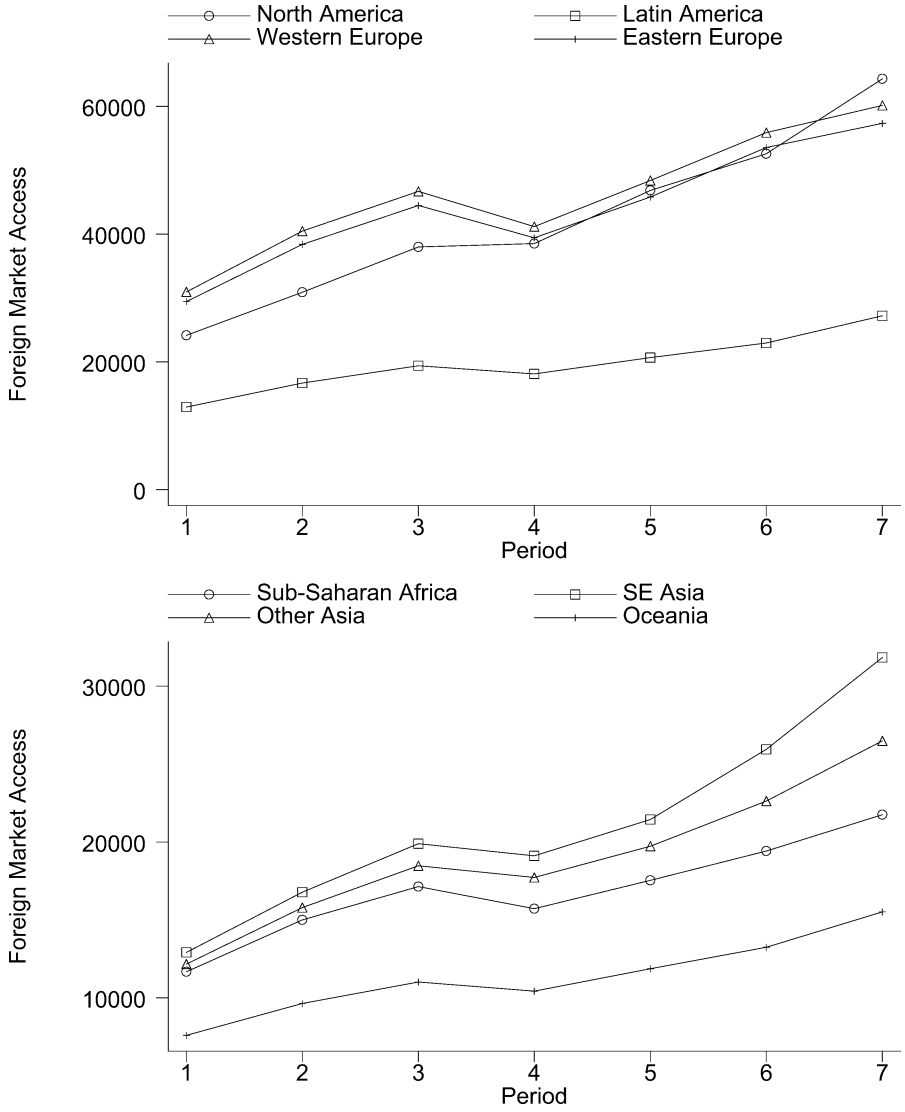

Fig. 1. Average regional FMA.

increases in a country's exports are due to improved own-country performance or external developments in trading partners. Appendix Table A.1 reports the decomposition for each country, and Table 2 of the text gives the regional aggregates. The first rows of Table 2, the benchmark case, report the rate of growth of overall world exports in each period and the growths of supply capacity and market capacity that would be observed if all countries had identical export performance.

A number of results stand out. South-East Asian countries experience export growth much faster than the benchmark in both periods. In the first period this was driven

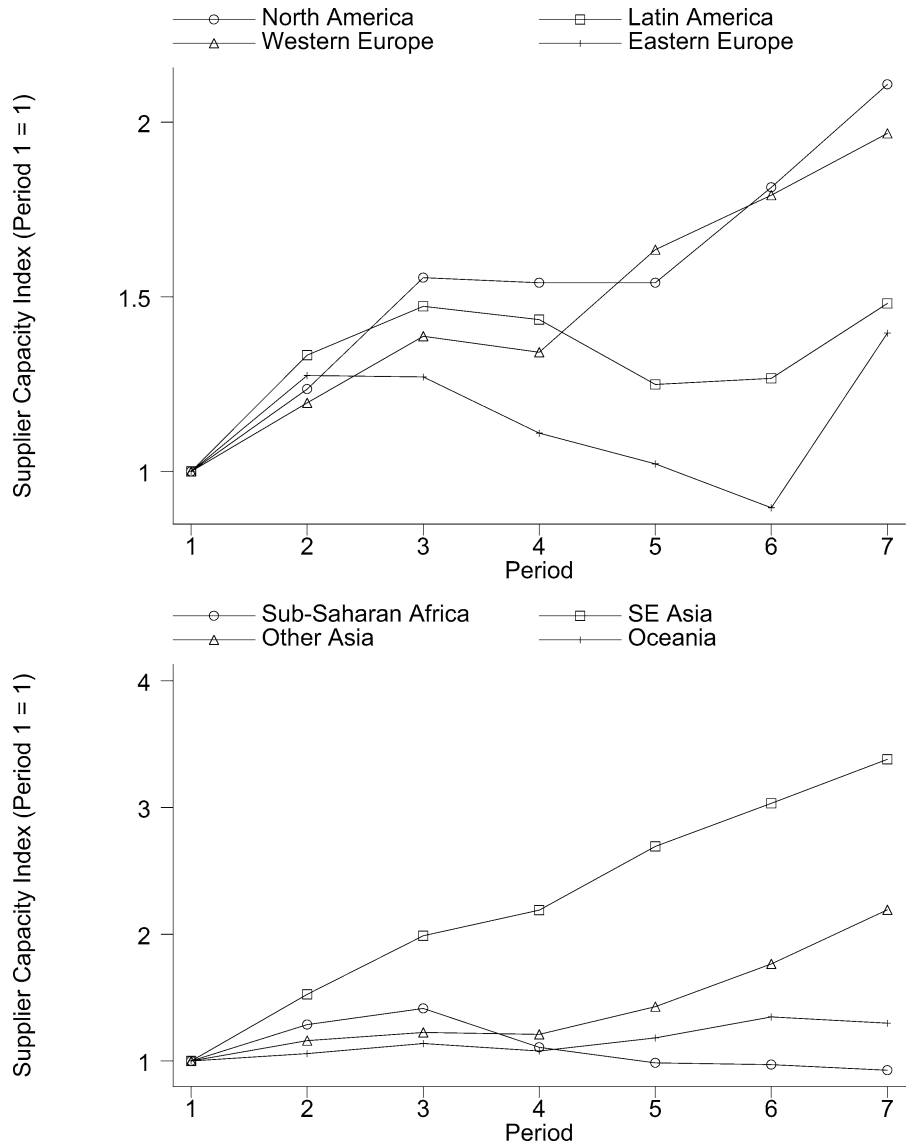

Fig. 2. Index of average regional supplier capacity.

particularly by supply capacity growth, and in the second FMA growth becomes relatively more important. Other Asia experienced below world average export growth in the first period, but this is accounted for by significantly faster than benchmark market access growth coupled with much slower than benchmark supply capacity growth. This is in sharp contrast to the second period where market access growth close to the benchmark was associated with supply capacity growth at twice the benchmark, giving overall export growth of nearly twice the world rate.

Table 2
Regional sources of export growth, 1970–1973-1994–1997, percentage rates of growth

Region	Period	Years	Exports, V (%)	Foreign market access, M (%)	Supplier capacity, s (%)
Benchmark	1–7	(70/73–94/97)	326.3	106.5	106.5
	1–4	(70/73–82/85)	104.4	42.9	42.9
	4–7	(82/85–94/97)	108.5	44.5	44.5
North America	1–7	(70/73–94/97)	288.99	166.07	110.86
	1–4	(70/73–82/85)	92.74	59.42	54.00
	4–7	(82/85–94/97)	101.82	66.90	36.92
Latin America	1–7	(70/73–94/97)	193.32	110.82	48.11
	1–4	(70/73–82/85)	90.17	40.39	43.45
	4–7	(82/85–94/97)	54.24	50.17	3.25
Western Europe	1–7	(70/73–94/97)	269.37	94.29	96.82
	1–4	(70/73–82/85)	75.05	33.02	34.12
	4–7	(82/85–94/97)	111.01	46.06	46.75
Eastern Europe	1–7	(70/73–94/97)	187.43	94.84	39.62
	1–4	(70/73–82/85)	44.03	33.95	10.95
	4–7	(82/85–94/97)	99.56	45.45	25.84
Sub-Saharan Africa	1–7	(70/73–94/97)	70.38	86.44	−7.24
	1–4	(70/73–82/85)	54.18	34.71	10.80
	4–7	(82/85–94/97)	10.50	38.40	−16.28
N. Africa and M. East	1–7	(70/73–94/97)	189.77	102.82	41.20
	1–4	(70/73–82/85)	245.48	48.38	135.71
	4–7	(82/85–94/97)	−16.13	36.69	−40.10
S-E Asia	1–7	(70/73–94/97)	826.17	146.35	238.04
	1–4	(70/73–82/85)	233.67	47.88	119.01
	4–7	(82/85–94/97)	177.57	66.59	54.35
Other Asia	1–7	(70/73–94/97)	371.95	117.80	119.31
	1–4	(70/73–82/85)	76.45	45.74	21.01
	4–7	(82/85–94/97)	167.48	49.44	81.23
Oceania	1–7	(70/73–94/97)	166.82	104.30	29.86
	1–4	(70/73–82/85)	48.35	37.34	7.89
	4–7	(82/85–94/97)	79.85	48.75	20.36

Notes. Regional variables are the sum of those for countries within a region; see Appendix A for countries included in each region. Columns (4)–(6) of the table are based on Eq. (7). Column (4) is the rate of growth of exports; column (5) is the rate of growth of foreign market access; column (6) is the rate of growth of supplier capacity. The rates of growth of supplier capacity and foreign market access compound to the rate of growth of total exports. At the country level, this decomposition is exact. When we aggregate to regions, the decomposition is approximate since

$$\sum_{i\in R_k} V_i = \sum_{i\in R_k} s_i M_i \neq \sum_{i\in R_k} s_i \sum_{i\in R_k} M_i.$$

Latin America shows a different picture. Close to benchmark market access growth in both periods was associated with close to benchmark supply capacity growth in the first period and weak growth in the second. Results for the Middle East and North Africa aggregate are dominated by oil-exporters, while those for Sub-Saharan Africa elaborate on a familiar story. Taking the two periods together, the contribution of FMA to Sub-Saharan Africa's export growth was nearly 20 percentage points below the benchmark case, suggesting the importance of geographical location in explaining the region's poor

Table 3
Sources of export growth in South-East Asian countries, 1970/73–1994/97, percentage rates of growth

Country	Years	Exports (%)	Foreign market access (%)	Supply capacity (%)
Cambodia	70/73–82/85	−93.89	38.73	−95.59
	82/85–94/97	5981.78	85.00	3187.36
China	70/73–82/85	267.26	47.05	149.75
	82/85–94/97	402.20	62.89	208.31
Hong Kong	70/73–82/85	234.75	47.08	127.59
	82/85–94/97	375.21	67.31	184.02
Indonesia	70/73–82/85	471.92	45.78	291.97
	82/85–94/97	55.99	63.79	−4.76
Japan	70/73–82/85	178.30	45.33	91.49
	82/85–94/97	88.46	70.04	10.83
Korea, Republic of	70/73–82/85	596.65	50.83	361.86
	82/85–94/97	208.37	44.47	113.44
Malaysia	70/73–82/85	221.05	62.23	97.90
	82/85–94/97	248.59	87.44	85.98
Papua, New Guinea	70/73–82/85	157.04	40.37	83.12
	82/85–94/97	106.73	50.31	37.54
Philippines	70/73–82/85	84.24	47.43	24.96
	82/85–94/97	164.25	60.92	64.21
Singapore	70/73–82/85	338.34	45.31	201.65
	82/85–94/97	288.86	74.01	123.47
Taiwan	70/73–82/85	363.93	53.89	201.47
	82/85–94/97	204.26	64.30	85.18
Thailand	70/73–82/85	205.30	44.20	111.71
	82/85–94/97	431.34	60.93	230.18
Vietnam	70/73–82/85	54.74	48.86	3.95
	82/85–94/97	1512.52	70.77	844.27

Notes. Columns (3)–(5) of the table are based on Eq. (7). Column (3) is the rate of growth of exports; column (4) is the rate of growth of foreign market access; column (5) is the rate of growth of supplier capacity. The rates of growth of supplier capacity and foreign market access compound to the rate of growth of total exports.

export performance. However, supply capacity grew less fast than the benchmark in both periods, and positive export growth in the second period was achieved by market access growth offsetting a reduction in supply capacity.

Table 3 presents results for individual South East Asian countries, while Appendix Table A.1 reports decompositions for the full set of countries. From Table 3, South East Asian FMA growth was generally faster in the second period than in the first, reflecting a rapid expansion of export opportunities in this region. For some of the earlier developers, supply capacity growth slowed sharply in the second period (e.g. Japan, Taiwan, Korea) while the later developers experienced a dramatic increase in second period supply capacity growth (e.g. Philippines, Thailand, Vietnam).[5]

The main messages from this section are then, that both levels and rates of growth of foreign market access vary widely across countries and regions. Foreign market access levels in Western Europe are nearly three times those in Sub-Saharan Africa. Thus,

[5] For a discussion of the commodity structure of East Asian export growth and its relationship to factor endowments and non-neutral technology differences, see Noland (1997).

taking as given supplier capacity, FMA plays an important role in accounting for export performance. In general equilibrium, there will typically also be an endogenous response of supplier capacity to external conditions, and we consider this idea further in Section 5. Before doing so, we look in more detail at the regional structure of FMA growth.

3.3. Regional effects

The decomposition of Tables 2 and 3 looks at FMA growth, but does not divide the sources of this growth geographically. How much FMA growth do countries receive from the performance of other countries in their own region and how much do they receive from growth in other regions. Out of these other regions, which are the more important?[6]

A country's foreign market access can be divided according to geographical regions in which the markets are located, and expressed as the sum of the access to markets in each region. Thus, if $M_i^{R(k)}$ is the market access derived by country i from region k, then

$$M_i^{R(k)} \equiv \sum_{j \in R(k)} (T_{ij})^{1-\sigma} m_j \quad \text{and} \quad M_i = M_i^{R(1)} + M_i^{R(2)} + \cdots + M_i^{R(K)}. \tag{11}$$

Changes in $M_i^{R(k)}$ can be computed for each country, and the final two columns of Appendix Table A.1 report, for each country, the contribution to FMA growth of the country's own region and of other regions in aggregate.

We begin by considering results for regional groupings. Thus, $M_{R(\ell)}^{R(k)}$ is the market access derived by all countries in region ℓ from region k, given by

$$M_{R(\ell)}^{R(k)} \equiv \sum_{i \in R(\ell)} M_i^{R(k)} \quad \text{and} \quad M_{R(\ell)} = M_{R(\ell)}^{R(1)} + M_{R(\ell)}^{R(2)} + \cdots + M_{R(\ell)}^{R(K)}. \tag{12}$$

The change in the market access of region ℓ can be decomposed into the contribution of regions k according to

$$\frac{\Delta M_{R(\ell)}}{M_{R(\ell)}} = \left(\frac{M_{R(\ell)}^{R(1)}}{M_{R(\ell)}}\right)\left(\frac{\Delta M_{R(\ell)}^{R(1)}}{M_{R(\ell)}^{R(1)}}\right) + \cdots + \left(\frac{M_{R(\ell)}^{R(K)}}{M_{R(\ell)}}\right)\left(\frac{\Delta M_{R(\ell)}^{R(K)}}{M_{R(\ell)}^{R(K)}}\right) \tag{13}$$

where there are two components to the contribution of each region. Region R_k may make a large contribution to region R_ℓ's FMA growth either because it constitutes a large share of the region's FMA, $\left(M_{R(\ell)}^{R(k)}/M_{R(\ell)}\right)$, or because there is rapid growth in market demand in the countries making up that region, $\left(\Delta M_{R(\ell)}^{R(k)}/M_{R(\ell)}^{R(k)}\right)$.

[6] In the gravity model used to generate the measures of trade costs on which foreign market access is based, trade frictions between countries are measured simply by distance and whether the countries share a common border. Another way in which regions may matter is if trade costs are lower within than between regions, for example, as a result of Regional Preferential Trade Agreements. See Redding and Venables (2003b) for further analysis.

Table 4
Percentage growth contributions of partner regions to the growth of foreign market access of each exporting region, periods 1–7 (1970/73–1994/7)

Exporter	Importer									
	FMA all regions (%)	North America (%)	Latin America (%)	Western Europe (%)	Eastern Europe (%)	Sub-Saharan Africa (%)	MENA (%)	S-E Asia (%)	Other Asia (%)	Oceania (%)
North America	166.07	141.42	3.22	9.53	0.29	−0.43	1.30	9.82	0.33	0.59
Latin America	110.82	59.11	19.32	13.99	0.42	−0.86	2.18	14.93	0.55	1.19
Western Europe	94.29	15.49	1.45	61.91	2.01	−0.53	2.90	10.15	0.50	0.41
Eastern Europe	94.84	14.38	1.44	60.67	2.99	−0.57	3.66	11.21	0.60	0.45
Sub-Saharan Africa	86.44	27.24	4.57	23.79	0.75	−2.44	6.00	23.84	1.36	1.34
N. Africa and M. East	102.82	20.36	2.35	33.04	1.08	−1.08	23.91	20.67	1.65	0.83
South-East Asia	146.35	19.10	2.18	13.04	0.46	−0.72	3.40	104.67	1.88	2.34
Other Asia	117.80	21.29	2.56	19.43	0.71	−1.02	7.67	58.39	7.10	1.67
Oceania	104.30	29.99	5.13	13.18	0.44	−1.02	3.22	46.60	1.26	5.49

Notes. A region's foreign market access (FMA) is the sum of the values of FMA for all countries within that region. Regional FMA growth is decomposed into the percentage contributions of each partner region using Eqs. (12) and (13). The exporting region is reported in the rows of the table and the importing partner in the columns.

Results are reported in Table 4 for the full 1970–1973-1994–1997 period.[7] Reading across the first row of the table we see that North America derived virtually all of its FMA growth from itself. This reflects the fact the Canada's FMA is large relative to that of the United States (FMA captures access to markets *other* than one's own), and 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, and own region FMA growth in Canada thus accounts for over 98% of total FMA growth.

Latin America was much more dependent on FMA growth from outside the region—almost entirely so in the first period. Of these extra-regional sources, North America is far away the most important. Turning to Europe, Western Europe provides a major source of FMA growth both for itself and for Eastern Europe. The striking features of Sub-Saharan Africa are the negative contribution of the own region effect, and the lack of a dominant external source of FMA growth. Over the period as a whole, North America was the most important, followed by Western Europe, with the Middle East and North Africa playing a noticeable role in the first sub-period.

The Asian figures illustrate two main points. One is the dominant role of intra-regional linkages within SE Asia, and the other is the growth in the importance of SE Asia for Other Asia. This arises partly from the growing import demands of SE Asia and partly also from the westwards expansion of economic activity in the SE Asia region. It is also interesting to look down the SE Asia column in Table 4, indicating the contribution of this region to

[7] Note that this decomposition of the growth in FMA shares features with the literature concerned with a shift-share analysis of countries' export growth (see for example Richardson, 1971), although it uses our theoretically-based measures.

Table 5
Percentage growth contributions of partner regions to the growth of foreign market access of South-East Asian countries, periods 1–7 (1970/73–1994/97)

Exporter	Importer									
	FMA all regions (%)	North America (%)	Latin America (%)	Western Europe (%)	Eastern Europe (%)	Sub-Saharan Africa (%)	MENA (%)	S-E Asia (%)	Other Asia (%)	Oceania (%)
Cambodia	156.65	16.36	1.95	12.17	0.43	−0.69	3.45	119.08	199	1.990
China	139.53	17.39	1.71	11.67	0.41	−0.58	2.78	101.92	2.65	1.56
Hong Kong	146.09	19.09	2.04	13.42	0.48	−0.71	3.46	104.57	1.78	1.96
Indonesia	138.78	19.30	2.71	13.90	0.48	−0.89	3.93	94.22	2.00	3.13
Japan	147.13	32.33	3.08	18.97	0.66	−0.91	4.07	84.56	1.67	2.70
Korea, Republic of	117.92	18.22	1.73	11.79	0.42	−0.56	2.64	81.09	1.14	1.46
Malaysia	204.08	15.07	1.96	11.33	0.40	−0.68	3.31	168.85	1.89	1.96
Papua, New Guinea	110.99	24.51	3.36	12.77	0.43	−0.82	3.06	59.58	1.28	6.81
Philippines	137.26	19.32	2.15	12.73	0.45	−0.71	3.24	96.19	1.58	2.40
Singapore	152.86	17.56	2.31	12.99	0.45	−0.79	3.74	112.15	2.05	2.41
Taiwan	152.85	18.76	1.93	12.51	0.44	−0.65	3.06	113.42	1.46	1.90
Thailand	132.06	19.11	2.27	14.70	0.52	−0.82	4.29	87.24	2.69	2.06
Vietnam	154.20	18.11	2.17	13.29	0.47	−0.76	3.72	112.94	2.10	2.17

Notes. Country FMA growth is decomposed into the percentage contributions of each partner region using Eq. (13). The exporting country is reported in the rows and the importing partner in the columns.

FMA growth in other regions; the region now provides a major potential source of demand for African exports.

Table 5 presents results for individual South-East Asian countries. The geographical concentration of export opportunities is again evident, with the own region accounting for more than one half of the foreign market access growth of all South-East Asian countries. Malaysia, in particular, benefited from rapid growth of export opportunities in this region, reflecting in part the high share of South-East Asia in Malaysia's overall foreign market access. After the own region, North America and Western Europe are the next most important sources of foreign market access growth, with these making the largest contributions in Japan. Other Asia's role is small reflecting slow growth in market demand, while Oceania makes the largest contributions in Indonesia and Papua New Guinea as is consistent with their geographical location relative to Australia and New Zealand.

4. Determinants of export performance

We have so far undertaken decompositions based on the identity that a country's exports are the product of its supply capacity, s_i, and foreign market access, M_i. We now turn to the next stage of the analysis, asking the question: what determines supply capacity? We expect that it depends on a number of underlying country characteristics including country size, endowments, and internal geography. It will also depend, in equilibrium, on foreign market access, since this is one of the variables that determines the return to exporting. Our objective in this section is to econometrically estimate the importance of these factors. We contribute to a growing literature on the role of geography

in determining the ratio of trade to income and trade performance more generally (see, for example, Ciccone and Alcalá, 2001; Frankel and Romer, 1999; Leamer, 1988; Radelet and Sachs, 1998; and Wei, 2000).

4.1. Theory

In order to endogenise supply capacity we have to add to the material of Section 2 some general equilibrium structure of the economy. We do this in a very compact way, by simply specifying a supply curve for exports, implying that as the quantity of exports produced in a country increases, so does their price. Using our previous analysis, the quantity of exports demanded from country i, $n_i x_i = n_i \sum_{j \neq i} x_{ij}$, is given by

$$n_i x_i = s_i M_i / p_i = n_i (p_i)^{-\sigma} (t_i)^{1-\sigma} M_i \tag{14}$$

(using Eqs. (4) and (8)). The supply relationship we specify by the function Ω,

$$n_i x_i = a_i \Omega (p_i / c_i), \quad \Omega' > 0. \tag{15}$$

We assume that the function Ω is the same for all countries, but add country specific parameters c_i and a_i to the relationship: c_i is a measure of comparative costs in the export sector of country i and a_i is a measure of the size of the economy. This is a general equilibrium relationship capturing the opportunity cost of resources used in the export sector. Expanding the volume of exports produced moves the economy around the production possibility frontier, increasing the price of exports. Thus, as the export sector expands it draws resources out of other sectors of the economy—import competing and non-tradeable activities. Drawing resources out of other sectors tends to bid up their prices, raising costs and hence price in the export sector.

Cross country variation is captured by linearization of these relationships. Logarithmically differentiating (14) and (15) gives

$$\hat{x} = -\sigma \hat{p} + (1-\sigma)\hat{t} + \widehat{M}, \qquad \hat{n} + \hat{x} = \hat{a} + \omega(\hat{p} - \hat{c}), \tag{16}$$

where ω is the price elasticity of export supply and $\hat{\cdot}$ denotes a proportional deviation from some reference point. Eliminating the price term gives

$$\hat{x}(\omega + \sigma) + \sigma \hat{n} = \omega\big[\widehat{M} - \sigma \hat{c} + (1-\sigma)\hat{t}\big] + \sigma \hat{a}. \tag{17}$$

The total value of exports, $V_i = n_i p_i x_i = s_i M_i$, (Eq. (7)) varies according to

$$\widehat{V} = \hat{n} + \hat{p} + \hat{x} = \hat{a} - \hat{c}\omega + \big\lfloor M + (1-\sigma)\hat{t} - \hat{x} \big\rfloor (1+\omega)/\sigma \tag{18}$$

where the second equation uses (16). One further step is needed, which is to specify whether export volumes vary through changes in the number of varieties, n, or output per variety, x. In a standard monopolistic competition model equilibrium output per commodity is a constant, $\hat{x} = 0$, in which case (18) is

$$\widehat{V} = \hat{a} - \hat{c}\omega + \big\lfloor \widehat{M} + (1-\sigma)\hat{t} \big\rfloor (1+\omega)/\sigma. \tag{19}$$

At the other extreme, if the number of varieties that can be produced by a country is fixed, $\hat{n} = 0$, then using (17) in (18) gives

$$\widehat{V} = \big\lfloor (\sigma - 1)(\hat{a} - \hat{c}\omega) + \big(\widehat{M} + (1-\sigma)\hat{t}\big)(1+\omega) \big\rfloor / (\sigma + \omega). \tag{20}$$

These equations form the basis of the econometric investigation, with variation in terms provided by cross-country observations. Notice that the coefficient on foreign market access in these equations is not generally equal to unity, reflecting the endogeneity of supply capacity. Thus if σ is large relative to ω (or, in the second equation if $\sigma > 1$), then the coefficient on $\widehat{M}$ is less than unity. High levels of foreign market access are associated with a less than proportional increase in exports and a lower level of supply capacity (since $V_i = s_i M_i$). This arises because increased demand for exports encounters diminishing returns in the domestic supply response, bidding up p_i. The coefficient on $\widehat{M}$ is smaller for low values of ω, this measuring a more tightly curved production possibility frontier and lower supply elasticity.

Other terms in the equations are as would be expected. Cross-country variation in internal geography is captured by $\hat{t}$, entering with negative coefficient providing $\sigma > 1$. Domestic size, $\hat{a}$, increases the value of exports, although not necessarily proportionately. And a high cost export sector, $\hat{c} > 0$, means that a lower volume of exports is supplied for a given price.

4.2. Estimation

Motivated by the theoretical analysis of the previous section (Eqs. (19) and (20)), we estimate the following empirical specification:

$$\ln(V_i) = \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(Popn_i) + \beta_3 \ln(M_i) + \beta_4 \ln(t_i) + \beta_5 c_i + \mu_k + \epsilon_i. \tag{21}$$

The dependent variable is the log of the value of exports. The log of GDP and of population are included as two separate measures of country size, and M_i is foreign market access as calculated in Section 3; t_i represents the internal geography of the country, and is measured empirically using the percentage of the population living within 100 km of the coast or navigable rivers (see Appendix A for sources).

To capture the comparative costs of exporting in each country, c_i, we use a measure of institutional quality, as has been widely used in the cross-country growth literature (see, for example, Acemoglu et al., 2001 and Knack and Keefer, 1997). The measure is an index of the protection of property rights/risk of expropriation (see Appendix A), and a higher value of the index corresponds to better institutional quality.

We also include a full set of dummies for the 9 geographical regions, μ_k, in order to control for unobserved heterogeneity across regions in the determinants of export performance, including other unobserved institutions, features of technology, and characteristics of regions.

Before presenting estimates of Eq. (21), a number of points merit discussion. First, the measure of Foreign Market Access (M) included on the right-hand side as a determinant of countries' export performance has itself been constructed from the export data. It is constructed from the solution of a system of simultaneous equations for all countries' total exports and total imports, and any individual country's exports enter this system of simultaneous equations as just one out of the $2R$ observations on exports and imports. A country's foreign market access depends on market capacities in all *other* countries,

weighted by bilateral trade costs (Eq. (8)). Nevertheless, to ensure that shocks to an individual country's exports are not driving our measure of foreign market access, we also construct for each country an alternative measure that completely excludes information on the own country's exports. In this alternative measure, M^*, we exclude one country i at a time and solve the system of equations in (7) to (10) for the $R-1$ other countries $j \neq i$ (excluding information on country i's exports to and imports from these other countries). This yields measures of market capacity and supplier capacity in all other countries $j \neq i$. The alternative foreign market access measure for country i is then constructed as the trade cost weighted sum of these market capacities. We repeat the analysis for all countries $i \in R$. This alternative measure provides a robustness check, and the measure turns out to be very highly correlated with the FMA measure of Section 3.

Second, the income term, GDP_i, may itself be endogenous. We consider two approaches to this problem. First, we impose a theoretical restriction that $\beta_1 = 1$, and take as the dependent variable the export to income ratio, V_i / GDP_i. In this specification, we focus on the ability of the explanatory variables to explain variation in the share of exports in GDP. Second, we use lagged values of GDP_i for the independent variable. We estimate Eq. (21) using the cross-section variation in the data and focus on the final time period 1994–1997. Here, the corresponding lagged income variable is 1990–1993.

Estimation results are reported in Table 6. The first column gives our base specification, using the lagged GDP variable. As expected the coefficient on GDP is positive and highly significant, although also significantly less than unity, reflecting the fact that large economies are less open than smaller ones. This suggests that working with the ratio of

Table 6
The role of internal geography, external geography, and institutions in determining export performance, 1994–1997

	(1)	(2)	(3)	(4)
Dependent variable	$\ln(V)$	$\ln(V/GDP)$	$\ln(V)$	$\ln(V/GDP)$
Period	1994–1997	1994–1997	1994–1997	1994–1997
Observations	95	95	95	95
ln(*GDP*(1991–1993))	0.734		0.73	
	(0.052)		(0.051)	
ln(population)	−0.038	−0.262	−0.025	−0.256
	(0.057)	(0.043)	(0.057)	(0.043)
$\ln(M)$	0.46	0.479	0.342	0.298
	(0.195)	(0.205)	(0.119)	(0.127)
% Pop. within 100 km	0.581	0.416	0.596	0.441
coast & rivers	(0.191)	(0.061)	(0.187)	(0.199)
institutional quality	0.202	0.023	0.198	0.016
	(0.062)	(0.387)	(0.061)	(0.061)
Region effects	yes	yes	yes	yes
Estimation	OLS	OLS	OLS	OLS
	F(13,81) = 137.6	F(12,82) = 7.732	F(13,81) = 142.2	F(12,82) = 7.747
Prob > F	0.000	0.000	0.000	0.000
R^2	0.957	0.531	0.958	0.531

Notes. Standard errors in parentheses. Columns 1 and 2, FMA as computed in Section 3. Columns 3 and 4, FMA computed omitting own country, M^*.

exports to GDP as dependent variable would be inappropriate. The other size measure, population, is insignificant.

We find a positive and statistically significant effect of both external and internal geography in determining exports. The coefficient on $\ln(M)$ is significantly less than unity, indicating that an increase in FMA increases exports less than proportionately. This is in line with the theoretical discussion above as the expansion in exports raises costs and prices in the sector, thereby reducing supply capacity This finding is also consistent with the earlier work (Redding and Venables, 2003a; Overman et al., 2003) which shows that a higher level of FMA is associated with higher wages. The coefficient on the proportion of population within 100 km of the coast or a navigable river is also significant and positive, capturing internal geography. Similar results are obtained if the proportion of population is replaced by the proportion of land area. The measure of institutional quality (risk of expropriation) has a positive and statistically significant effect on export performance, consistent with an important role for the protection of property rights in determining countries ability to export.

The second column of Table 6 gives results for the specification with the export ratio taken as the independent variable. Coefficients on $\ln(M)$ and on internal geography are similar to those in the first column. However, the population term becomes negative and significant, and the coefficient on institutional quality becomes smaller and insignificant. The fact that smaller economies tend to export less is being captured by the negative coefficient on population, and perhaps also by a positive correlation between institutional quality (now with a smaller coefficient) and per capita income.

Columns 3 and 4 repeat the exercise with the alternative measure of foreign market access discussed above, M^*. Signs and significance levels are unchanged using this alternative variable. The size of the coefficient on $\ln(M^*)$ is somewhat smaller than that on $\ln(M)$, although the difference is not statistically significant at conventional critical values.

4.3. Effects by region

We use these econometric estimates to shed light on patterns of export performance across the 9 geographical regions. To what extent are the divergent performances of these regions explained by this model, and which of the independent variables are more important in explaining the variation in performance across regions?

The expected value of exports by region k relative to the expected value for the world, $E_{i\in R(k)}\ln(V_i) - E_i\ln(V_i)$, can be expressed as a linear function of regional deviations in independent variables times their estimated coefficients. Formally, regression Eq. (21) implies that

$$E_{i\in R(k)}\ln(V_i) - E_i\ln(V_i) = \alpha_k(a) + \alpha_k(M) + \alpha_k(t) + \alpha_k(c) + \mu_k, \tag{22}$$

where μ_k is the regional dummy of Eq. (21), and remaining terms are the regional contributions of the independent variables:

$$\begin{aligned}\alpha_k(a) &= \beta_1\left[E_{i\in R(k)}\ln(GDP_i) - E_i\ln(GDP_i)\right] \\ &\quad + \beta_2\left[E_{i\in R(k)}\ln(Popn_i) - E_i\ln(Popn_i)\right], \\ \alpha_k(M) &= \beta_3\left[E_{i\in R(k)}\ln(M_i) - E_i\ln(M_i)\right],\end{aligned}$$

$$\alpha_k(t) = \beta_4\big[E_{i\in R(k)} \ln(t_i) - E_i \ln(t_i)\big],$$
$$\alpha_k(c) = \beta_5\big[E_{i\in R(k)} c_i - E_i c_i\big]. \tag{23}$$

Thus, $\alpha_k(M) \equiv \beta_3\lfloor E_{i\in R(k)} \ln(M_i) - E_i \ln(M_i)\rfloor$ is region k's FMA, relative to that of the world, times the estimated coefficient on FMA. Terms $\alpha_k(t)$ and $\alpha_k(c)$ are the analogous measures for internal geography and institutions, while size effects are combined in $\alpha_k(a)$.

We illustrate results for each region in Fig. 3, where values are based on the estimates given in the first column of Table 6. The first bar in each of the regional boxes, labelled $\alpha_k(V)$, is the region's export performance relative to the world average once size effects have been conditioned out, $\alpha_k(V) \equiv E_{i\in R(k)} \ln(V_i) - E_i \ln(V_i) - \alpha_k(a)$. Remaining bars sum to this first bar, since they divide $\alpha_k(V)$ into four components (see Eq. (22)). Bars two to four give respectively the contributions of foreign market access, M, internal geography, t, and institutions, c. The residual, after controlling for these factors, is the regional dummy μ_k, illustrated as the final bar in each chart.

What do we learn from this decomposition? North America (including Mexico) has high trade relative to the world, given its income and population. This is explained partly by relatively good market access and partly by institutions. It is offset by relatively poor internal geography leaving a substantial unexplained residual. 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. The outcome for Oceania combines low market access with good internal geography and institutions.

Sub-Saharan African has low trade volumes given its income and population, and these are accounted for by below average performance on all three measures, together with some negative residual. Thus, each of $\alpha_k(M)$, $\alpha_k(t)$, $\alpha_k(c)$ and μ_k account for between 20% and 30% of Sub-Saharan Africa's low level of trade after conditioning on country size, $\alpha_k(V)$.[8]

In South-East Asia, high levels of exports relative to country size are explained by a close to world average foreign market access (though rapidly growing), above world average internal geography and institutional quality, with a substantial positive residual reflecting the entrepôt activities of Hong Kong and Singapore and aspects of the Asian Miracle not captured in our approach.

5. Concluding comments

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. However, many South East Asia

[8] Our finding of a role for internal geography in Sub-Saharan Africa is consistent with a recent literature that has emphasized physical geography and lack of infrastructure investment as impediments to African trade (see, for example, Amjadi et al., 1996; Radelet and Sachs, 1998; Limao and Venables, 2001).

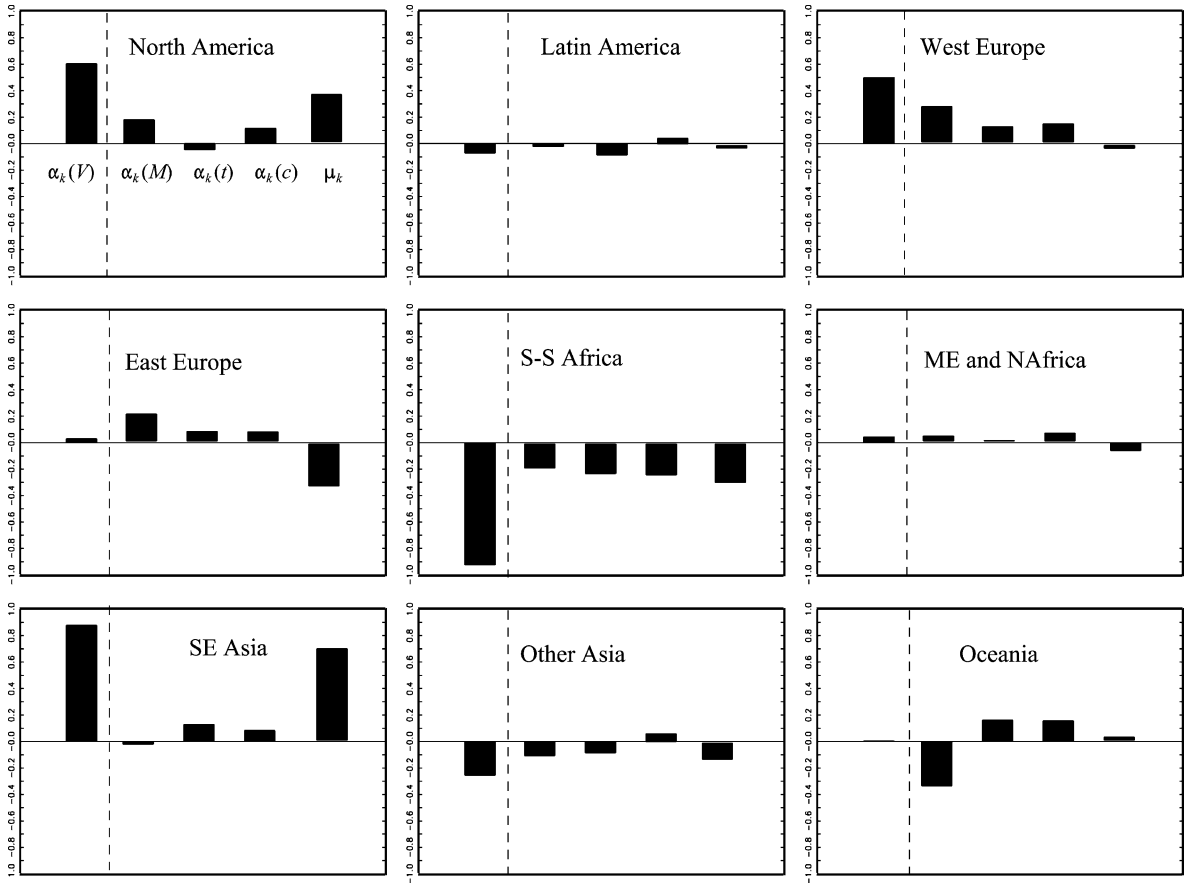

Fig. 3. Regional export performance, 1994–1997: Contributions of foreign market access $\alpha_k(M)$, internal geography $\alpha_k(t)$, institutions $\alpha_k(c)$, and residual μ_k.

countries, including China, Hong Kong, South Korea, Malaysia, Singapore, Taiwan and Thailand, saw real exports more than treble in each period, while a number of Sub-Saharan African countries actually experienced falling real exports.

This paper has examined the determinants of divergent levels and rates of growth of exports across countries and regions, focusing in particular on South-East Asia. We showed how the gravity equation may be used to develop a general decomposition of export growth into the contributions of increased external demand (foreign market access) and improvements in internal supply-side conditions (supply capacity). Differential foreign market access growth makes a substantial contribution towards explaining divergent export performance. While the foreign market access of Japan, Malaysia and Singapore increased by more than 70% between the mid 1980s and late 1990s, the foreign market access of Benin, Cameron and Sudan in Sub-Saharan Africa increased by less than half this amount.

The role of distance in reducing trade flows implies that the export opportunities generated by rising foreign market demand are geographically concentrated. Thus, countries in South-East Asia have been at the centre of a fast growing region, which accounted for more than one half of their overall foreign market access growth between the early 1970s and late 1990s. In contrast, poor growth performance in Sub-Saharan Africa meant that the own region actually made a negative contribution towards the foreign market access growth of many Sub-Saharan African countries.

Having separated out the contributions of foreign market access and internal supply capacity to export performance, we developed a simple theoretical structure to show how countries' supply capacity depends on internal geography (such as access to ports), on measures of the business environment (such as institutional quality) and also—in equilibrium—on external geography (foreign market access).

All three characteristics were shown to play a statistically significant and quantitatively important role in explaining cross-country export performance. Poor performance along these dimensions explains almost all of Sub-Saharan Africa's low level of exports, with each characteristic making a roughly equal contribution. South-East Asia's high level of exports can only be partly explained in these terms; there remains a substantial positive residual, reflecting the entrepôt activities of Hong Kong and Singapore and aspects of the Asian miracle not captured in our approach.

Perhaps the main contribution of the paper is to show how to measure and control for the external and internal geographic factors that shape export performance. Our hope is that, once these are successfully controlled for, research will be better able to identify other domestic factors (some of them subject to policy control) that play an important role.

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Appendix A

A.1. Data

Bilateral trade: data on bilateral trade flows are from the NBER World Trade database. Deflated by the US GDP deflator.

GDP per capita: data on current price (US dollars) GDP and on population are from the World Bank. Deflated by US GDP deflator

Geographical variables: data on bilateral distance, existence of a common border from the World Bank.

Physical geography and institutional, social, and political characteristics: data on proportion of land and population close to coast or navigable rivers from Gallup et al. (1998). The data can be downloaded from http://www2.cid.harvard.edu/ciddata.

Institutions: expropriation risk from International Country Risk Guide database.

A.2. Regional groupings

North America: Canada, USA, Mexico.

Latin America and the Caribbean: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Nicaragua, Panama, Peru, Trinidad and Tobago, Uruguay, and Venezuela.

Western Europe: Austria, Belgium (including Luxembourg), Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom.

Eastern Europe: Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania.

Sub-Saharan Africa: Angola, Benin, Cameroon, Cote d'Ivoire, Cameroon, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mauritius, Mozambique, Morocco, Nigeria, Senegal, South Africa, Sudan, Tanzania, Uganda, Zaire, Zambia, and Zimbabwe.

Middle East and North Africa: Algeria, Egypt, Iran, Israel, Jordan, Kuwait, Lebanon, Morocco, Oman, Saudi Arabia, Syria, Tunisia, United Arab Emirates.

South East Asia: Cambodia, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Papua New Guinea, Philippines, Singapore, Taiwan, Thailand.

Other Asia: Bangladesh, India, Sri Lanka, Nepal, and Pakistan.

Oceania: Australia, New Zealand.

Table A.1
Country sources of export growth and the regional concentration of foreign market access growth

Country	Period	Supply capacity (%)	Foreign market access (%)	Exports (%)	Own region FMA (%)	Other region FMA (%)
			North America			
Canada	70/73–82/85	2.71	73.91	78.62	69.4	4.5
	82/85–94/97	2.46	70.61	74.81	65.3	5.3
Mexico	70/73–82/85	307.49	46.72	497.87	36.3	10.4
	82/85–94/97	56.81	65.22	159.09	48.8	16.4
United States	70/73–82/85	52.56	20.65	84.06	3.3	17.3
	82/85–94/97	37.90	49.10	105.61	19.4	29.7
			Latin America			
Argentina	70/73–82/85	3.96	29.04	34.15	0.5	28.5
	82/85–94/97	41.04	63.79	131.01	30.3	33.5
Bolivia	70/73–82/85	13.40	29.65	47.02	−1.6	31.2
	82/85–94/97	−35.03	59.35	3.53	24.8	34.6
Brazil	70/73–82/85	105.77	31.49	170.58	−1.6	33.1
	82/85–94/97	−6.65	51.21	41.16	14.1	37.1
Chile	70/73–82/85	18.58	28.77	52.70	−2.0	30.8
	82/85–94/97	83.77	56.08	186.83	19.9	36.2
Colombia	70/73–82/85	23.71	40.40	73.69	3.3	37.1
	82/85–94/97	53.89	46.69	125.74	11.7	35.0
Costa Rica	70/73–82/85	4.72	45.78	52.65	5.1	40.7
	82/85–94/97	62.72	45.46	136.68	8.3	37.2
Dominican Republic	70/73–82/85	−10.00	49.76	34.78	2.7	47.1
	82/85–94/97	108.67	40.72	193.64	3.3	37.4
Ecuador	70/73–82/85	151.37	39.19	249.88	2.0	37.2
	82/85–94/97	−8.07	48.06	36.11	11.1	37.0
El Salvador	70/73–82/85	−28.01	44.20	3.81	2.2	42.0
	82/85–94/97	−18.40	48.24	20.97	8.6	39.6
Guatemala	70/73–82/85	−0.24	45.09	44.75	2.2	42.9
	82/85–94/97	−16.50	56.30	30.51	7.3	49.0
Haiti	70/73–82/85	180.97	48.56	317.41	2.2	46.3
	82/85–94/97	−81.19	43.96	−72.92	6.8	37.2
Honduras	70/73–82/85	6.25	44.23	53.24	2.1	42.1
	82/85–94/97	−36.84	46.62	−7.40	7.7	38.9
Jamaica	70/73–82/85	−43.36	50.44	−14.79	2.9	47.6
	82/85–94/97	3.69	42.64	47.90	4.4	38.3
Nicaragua	70/73–82/85	−51.99	44.38	−30.69	2.7	41.7
	82/85–94/97	−24.25	47.62	11.82	9.1	38.6
Panama	70/73–82/85	−14.80	42.78	21.64	1.8	41.0
	82/85–94/97	6.19	47.03	56.12	9.4	37.7
Peru	70/73–82/85	−10.25	35.59	21.69	1.2	34.4
	82/85–94/97	−1.93	53.90	50.92	17.7	36.2
Trinidad and Tobago	70/73–82/85	40.46	44.13	102.44	3.0	41.2
	82/85–94/97	−52.42	41.09	−32.87	4.6	36.5
Uruguay	70/73–82/85	52.02	15.49	75.57	−6.4	21.9
	82/85–94/97	−7.14	87.22	73.85	58.5	28.7
Venezuela	70/73–82/85	39.69	43.63	100.63	1.9	41.8
	82/85–94/97	−32.04	47.58	0.30	10.6	37.0

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Table A.1 (*Continued*)

Country	Period	Supply capacity (%)	Foreign market access (%)	Exports (%)	Own region FMA (%)	Other region FMA (%)
			Western Europe			
Austria	70/73–82/85	44.54	28.48	85.71	16.8	11.7
	82/85–94/97	58.77	54.54	145.37	39.8	14.7
Belgium	70/73–82/85	11.74	33.90	49.62	24.9	9.0
(incl. Luxembourg)	82/85–94/97	45.43	48.24	115.58	40.5	7.8
Denmark	70/73–82/85	22.67	31.32	61.09	19.6	11.7
	82/85–94/97	34.43	50.51	102.34	39.6	10.9
Finland	70/73–82/85	37.30	30.62	79.33	12.0	18.6
	82/85–94/97	77.39	40.70	149.60	23.6	17.1
France	70/73–82/85	27.92	29.60	65.79	18.0	11.6
	82/85–94/97	43.09	52.71	118.51	42.6	10.1
Germany	70/73–82/85	27.51	28.29	63.59	14.5	13.8
	82/85–94/97	37.36	49.64	105.55	32.3	17.3
Greece	70/73–82/85	65.23	40.26	131.76	15.4	24.9
	82/85–94/97	20.21	39.84	68.11	23.5	16.4
Ireland	70/73–82/85	102.15	34.20	171.28	18.6	15.6
	82/85–94/97	133.79	45.39	239.91	32.1	13.3
Italy	70/73–82/85	40.84	34.67	89.67	15.2	19.5
	82/85–94/97	61.49	43.50	131.74	28.5	15.0
Netherlands	70/73–82/85	32.22	32.16	74.74	21.5	10.7
	82/85–94/97	19.07	46.99	75.02	37.5	9.5
Norway	70/73–82/85	93.16	31.80	154.59	15.0	16.8
	82/85–94/97	22.67	40.04	71.79	24.8	15.2
Portugal	70/73–82/85	21.12	38.31	67.52	16.1	22.2
	82/85–94/97	125.85	49.78	238.28	32.5	17.3
Spain	70/73–82/85	100.36	35.68	171.84	15.1	20.5
	82/85–94/97	116.11	41.68	206.18	26.2	15.5
Sweden	70/73–82/85	5.65	33.87	41.43	16.0	17.9
	82/85–94/97	39.53	40.54	96.10	24.3	16.2
Switzerland	70/73–82/85	33.72	31.84	76.30	20.5	11.4
	82/85–94/97	43.52	51.53	117.47	41.7	9.8
Turkey	70/73–82/85	129.06	36.75	213.24	11.8	24.9
	82/85–94/97	87.06	35.69	153.82	19.2	16.5
United Kingdom	70/73–82/85	36.68	38.55	89.38	22.7	15.8
	82/85–94/97	36.49	35.09	84.38	22.0	13.1
			Eastern Europe			
Albania	70/73–82/85	84.57	36.57	152.07	0.0	36.5
	82/85–94/97	−43.46	37.34	−22.35	1.3	36.0
Bulgaria	70/73–82/85	27.01	35.56	72.17	−0.7	36.3
	82/85–94/97	−9.33	43.17	29.81	3.0	40.2
Czechoslovakia	70/73–82/85	2.86	31.08	34.83	−0.5	31.6
	82/85–94/97	77.54	54.48	174.26	2.9	51.6
Hungary	70/73–82/85	−11.31	34.92	19.66	−0.6	35.5
	82/85–94/97	44.67	41.52	104.73	3.3	38.2
Poland	70/73–82/85	−0.44	31.34	30.76	−0.2	31.5
	82/85–94/97	57.83	49.69	136.25	1.8	47.8
Romania	70/73–82/85	47.75	37.74	103.52	0.1	37.6
	82/85–94/97	−28.69	38.34	−1.36	2.4	35.9

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Table A.1 (*Continued*)

Country	Period	Supply capacity (%)	Foreign market access (%)	Exports (%)	Own region FMA (%)	Other region FMA (%)
			Sub-Saharan Africa, North Africa and Middle East			
Angola	70/73–82/85	14.67	30.48	49.62	−2.8	33.3
	82/85–94/97	13.81	37.95	57.01	−1.9	39.9
Benin	70/73–82/85	4.81	36.35	42.91	3.1	33.2
	82/85–94/97	−5.98	32.10	24.21	−4.9	37.0
Cameroon	70/73–82/85	154.00	37.41	249.03	3.7	33.7
	82/85–94/97	−53.45	31.61	−38.73	−5.1	36.7
Cote d'Ivoire	70/73–82/85	30.17	32.94	73.04	−1.5	34.5
	82/85–94/97	−22.83	39.04	7.30	−1.1	40.1
Ethiopia	70/73–82/85	−33.83	41.87	−6.12	−0.8	42.7
	82/85–94/97	−29.71	35.62	−4.68	−0.9	36.5
Gabon	70/73–82/85	169.54	35.08	264.10	0.9	34.2
	82/85–94/97	−16.34	34.97	12.92	−3.5	38.4
Ghana	70/73–82/85	−51.31	35.75	−33.90	1.5	34.2
	82/85–94/97	35.02	35.38	82.80	−3.3	38.6
Guinea	70/73–82/85	134.95	33.49	213.63	−1.9	35.4
	82/85–94/97	−23.31	39.84	7.25	−1.2	41.0
Kenya	70/73–82/85	29.93	36.42	77.24	−1.8	38.2
	82/85–94/97	−12.85	38.40	20.61	−0.5	38.9
Madagascar	70/73–82/85	−37.96	35.22	−16.11	−1.5	36.7
	82/85–94/97	−50.35	42.61	−29.19	0.0	42.6
Malawi	70/73–82/85	20.67	30.46	57.43	−3.6	34.0
	82/85–94/97	−18.21	40.66	15.05	0.3	40.4
Mali	70/73–82/85	−88.27	36.63	−83.97	0.5	36.1
	82/85–94/97	−12.42	38.54	21.33	−1.3	39.9
Mauritius	70/73–82/85	37.04	36.29	86.77	−1.5	37.7
	82/85–94/97	97.37	43.71	183.63	−0.5	44.2
Mozambique	70/73–82/85	−75.03	27.47	−68.17	−3.5	30.9
	82/85–94/97	−56.84	43.73	−37.96	4.1	39.6
Nigeria	70/73–82/85	122.31	35.22	200.60	−1.0	36.2
	82/85–94/97	−49.43	39.04	−29.69	−0.7	39.7
Senegal	70/73–82/85	−13.97	35.84	16.87	−1.3	37.1
	82/85–94/97	−48.02	40.77	−26.83	−0.9	41.6
South Africa	70/73–82/85	−6.22	34.18	25.83	−1.2	35.4
	82/85–94/97	33.19	44.56	92.54	−0.5	45.1
Sudan	70/73–82/85	−42.06	43.21	−17.02	−0.8	44.1
	82/85–94/97	−67.13	34.88	−55.67	−0.5	35.4
Tanzania	70/73–82/85	−48.49	34.51	−30.72	−2.3	36.8
	82/85–94/97	−29.50	39.75	−1.48	0.0	39.7
Uganda	70/73–82/85	−48.21	35.19	−29.98	−1.8	37.0
	82/85–94/97	−27.45	37.45	−0.28	−0.6	39.0
Zaire	70/73–82/85	−34.05	33.43	−12.00	−0.9	34.3
	82/85–94/97	−54.51	37.86	−36.87	−1.3	39.2
Zambia	70/73–82/85	−67.90	33.14	−57.26	−0.8	33.9
	82/85–94/97	−49.35	41.39	−28.38	1.6	39.8
Zimbabwe	70/73–82/85	341.18	24.27	448.27	−6.8	31.1
	82/85–94/97	19.76	41.05	68.92	1.7	39.3
Algeria	70/73–82/85	203.95	37.06	316.59	5.7	31.4

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Table A.1 (*Continued*)

Country	Period	Supply capacity (%)	Foreign market access (%)	Exports (%)	Own region FMA (%)	Other region FMA (%)
	82/85–94/97	−51.74	40.67	−32.12	0.4	40.3
Egypt	70/73–82/85	85.79	40.23	160.54	13.8	26.4
	82/85–94/97	−36.75	40.37	−11.21	0.4	36.2
Iran	70/73–82/85	131.64	48.88	244.86	18.8	30.0
	82/85–94/97	−50.45	37.76	−31.74	−2.9	40.7
Israel	70/73–82/85	30.83	59.69	108.92	34.2	25.5
	82/85–94/97	130.86	23.37	184.80	−7.5	30.9
Jordan	70/73–82/85	312.61	46.86	505.96	26.9	20.0
	82/85–94/97	−20.10	50.75	20.46	24.4	26.4
Kuwait	70/73–82/85	−5.83	72.11	62.07	44.9	27.2
	82/85–94/97	−60.10	22.24	−51.23	−8.8	31.0
Lebanon	70/73–82/85	−42.87	51.98	−13.17	27.6	24.4
	82/85–94/97	−41.90	35.03	−21.45	4.0	31.1
Morocco	70/73–82/85	8.57	38.31	50.16	6.6	31.8
	82/85–94/97	17.92	40.40	65.56	−1.9	42.3
Oman	70/73–82/85	153.43	63.84	315.21	33.8	30.0
	82/85–94/97	−18.49	37.80	12.32	3.0	34.8
Saudi Arabia	70/73–82/85	181.50	42.94	302.39	15.1	27.8
	82/85–94/97	−55.62	42.06	−36.96	3.7	38.3
Syria	70/73–82/85	107.20	41.39	192.95	18.5	22.9
	82/85–94/97	8.35	42.70	54.62	9.6	33.1
Tunisia	70/73–82/85	134.51	38.48	224.75	7.8	30.7
	82/85–94/97	59.91	34.60	115.24	−2.3	36.9
United Arab	70/73–82/85	510.10	63.88	899.83	34.9	29.0
Emirates	82/85–94/97	−27.55	26.40	−8.42	−7.8	34.2
			South-East and Other Asia			
Cambodia	70/73–82/85	−95.59	38.73	−93.89	22.4	16.4
	82/85–94/97	3187.36	85.00	5981.78	69.7	15.3
China	70/73–82/85	149.75	47.05	267.26	31.3	15.7
	82/85–94/97	208.31	62.89	402.20	48.0	14.9
Hong Kong	70/73–82/85	127.59	47.08	234.75	29.3	17.8
	82/85–94/97	184.02	67.31	375.21	51.2	16.1
Indonesia	70/73–82/85	291.97	45.78	471.92	27.1	18.7
	82/85–94/97	−4.76	63.79	55.99	46.0	17.8
Japan	70/73–82/85	91.49	45.33	178.30	19.4	26.0
	82/85–94/97	10.83	70.04	88.46	44.9	25.2
Korea, Republic	70/73–82/85	361.86	50.83	596.65	35.3	15.6
	82/85–94/97	113.44	44.47	208.37	30.4	14.1
Malaysia	70/73–82/85	97.90	62.23	221.05	47.0	15.3
	82/85–94/97	85.98	87.44	248.59	75.1	12.3
Papua, New Guinea	70/73–82/85	83.12	40.37	157.04	20.0	20.4
	82/85–94/97	37.54	50.31	106.73	28.2	22.1
Philippines	70/73–82/85	24.96	47.43	84.24	30.2	17.2
	82/85–94/97	64.21	60.92	164.25	44.8	16.2
Singapore	70/73–82/85	201.65	45.31	338.34	27.9	17.5
	82/85–94/97	123.47	74.01	288.86	58.0	16.0
Taiwan	70/73–82/85	201.47	53.89	363.93	37.2	16.7
	82/85–94/97	85.18	64.30	204.26	49.5	14.8

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Table A.1 (*Continued*)

Country	Period	Supply capacity (%)	Foreign market access (%)	Exports (%)	Own region FMA (%)	Other region FMA (%)
Thailand	70/73–82/85	111.71	44.20	205.30	24.3	19.9
	82/85–94/97	230.18	60.93	431.34	43.6	17.3
Vietnam	70/73–82/85	3.95	48.86	54.74	31.0	17.9
	82/85–94/97	844.27	70.77	1512.52	55.0	15.7
Bangladesh	70/73–82/85	132.16	45.29	237.32	3.7	41.6
	82/85–94/97	114.21	53.24	228.26	2.1	51.2
India	70/73–82/85	20.29	45.17	74.61	2.7	42.5
	82/85–94/97	89.57	48.34	181.20	1.1	47.2
Nepal	70/73–82/85	−2.75	45.52	41.52	4.6	40.9
	82/85–94/97	114.41	53.92	230.02	2.5	51.4
Pakistan	70/73–82/85	13.46	48.16	68.10	5.8	42.4
	82/85–94/97	55.26	43.67	123.07	3.6	40.1
Sri Lanka	70/73–82/85	7.04	44.18	54.34	3.6	40.6
	82/85–94/97	52.39	48.27	125.94	0.5	47.7
			Oceania			
Australia	70/73–82/85	9.21	37.74	50.43	0.6	37.1
	82/85–94/97	20.59	49.90	80.77	0.6	49.3
New Zealand	70/73–82/85	2.81	36.97	40.81	4.2	32.8
	82/85–94/97	19.38	47.66	76.29	3.8	43.9

Notes. Columns (3)–(5) of the table are based on Eq. (7). Column (3) is the rate of growth of supplier capacity (s); column (4) is the rate of growth of foreign market access (FMA); column (5) is the rate of growth of exports. The rates of growth of supplier capacity and foreign market access compound to the rate of growth of total exports. Columns (6) and (7) are based on Eq. (13). Column (6) reports the contribution of a country's own region FMA growth, while column (7) gives the corresponding contribution of other region FMA growth.

References

Acemoglu, D., Johnson, S., Robinson, J., 2001. The colonial origins of comparative development: an empirical investigation. American Economic Review 91 (5), 1369–1401.

Amjadi, A., Reincke, U., Yeats, A., 1996. Did External Barriers Cause the Marginalization of Sub-Saharan Africa in World Trade? World Bank, Washington, DC.

Anderson, J., 1979. A theoretical foundation for the gravity equation. American Economic Review 69 (1), 106–116.

Anderson, J., Van Wincoop, E., 2003. Gravity with gravitas: A solution to the border puzzle. American Economic Review 93 (1), 170–192.

Ciccone, A., Alcalá, F., 2001. Trade and productivity. CEPR discussion paper No. 3095.

Deardorff, A., 1998. Determinants of bilateral trade: Does gravity work in a neoclassical world. Chapter 1 in: Frankel, J. (Ed.), The Regionalisation of the World Economy. NBER and Chicago Univ. Press.

Eaton, J., Kortum, S., 2002. Technology, geography and trade. Econometrica 70 (5), 1741–1779.

Feenstra, R., Lipsey, R., Bowen, H., 1997. World trade flows, 1970–92, with production and tariff data. NBER working paper No. 5910.

Feenstra, R., 2001. World trade flows, 1980-97. Mimeo, Univ. of California, Davis.

Feenstra, R., 2002. Border effects and the gravity equation: consistent methods for estimation. Scottish Journal of Political Economy 49 (5), 491–506.

Frankel, J., Romer, D., 1999. Does trade cause growth? American Economic Review 89 (3), 379–399.

Fujita, M., Krugman, P., Venables, A.J., 1999. The Spatial Economy: Cities, Regions, and International Trade. MIT Press.

Gallup, J., Sachs, J., Mellinger, A., 1998. Geography and economic development. In: Proceedings of World Bank Annual Conference on Development Economics. World Bank, Washington.

Knack, S., Keefer, P., 1997. Does social capital have an economic payoff? Quarterly Journal of Economics 112, 1251–1288.

Leamer, E., 1988. Measures of openness. In: Baldwin, R. (Ed.), Trade Policy Issues and Empirical Analysis. Univ. of Chicago Press, Chicago.

Limao, N., Venables, A.J., 2001. Infrastructure, geographical disadvantage and transport costs. World Bank Economic Review 15, 451–479.

Noland, M., 1997. Has Asian export performance been unique? Journal of International Economics 43, 79–101.

Overman, H.G., Redding, S., Venables, A.J., 2003. The economic geography of trade, production, and income: a survey of empirics. In: Choi, K., Harrigan, J. (Eds.), Handbook of International Trade. Basil Blackwell, Oxford.

Pack, H., Page, J., 1994. Accumulation, exports and growth in the high-performing Asian countries. Carnegie–Rochester Conference Series on Public Policy 40, 199–236.

Radelet, S., Sachs, J., 1998. Shipping costs, manufactured exports, and economic growth. Presented at the American Economic Association Meetings. Mimeo. Harvard University.

Redding, S., Venables, A., 2003a. Economic geography and international inequality. Journal of International Economics. In press.

Redding, S., Venables, A., 2003b. Geography and export performance: External market access and internal supply capacity. In: Baldwin, R., Winters, A. (Eds.), Challenges to Globalization. NBER and Chicago Univ. Press, in press.

Richardson, D., 1971. Constant market shares analysis of export growth. Journal of International Economics 1, 227–239.

Rodriguez, F., Rodrik, D., 2000. Trade policy and economic growth: A skeptic's guide to the cross-national evidence. In: Macroeconomics Annual. NBER and MIT Press.

Rodrik, D., 1994. King Kong meets Godzilla: The World Bank and the East Asian miracle. In: Fishlow, A., Gwin, C., Haggard, S., Rodrik, D., Wade, R. (Eds.), Miracle or Design? Lessons from the East Asian Experience. Overseas Development Council, Washington, DC.

Rodrik, D., Subramanian, A., Trebbi, F., 2002. Institutions rule: The primacy of institutions over geography and integration in economic development. NBER working paper No. 9305.

Sachs, J., Warner, A., 1995. Economic reform and the process of global integration. Brookings Papers on Economic Activity (1), 1–95.

Wei, S., 2000. Natural openness and good government. NBER working paper No. 7765.

World Bank, 1993. The East Asian Miracle. Oxford Univ. Press, Oxford.