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A New Resource Curse? Impacts of China's Boom on Comparative Advantage and Resource Dependence in Southeast Asia

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Summary. — Due to China's rapid growth and integration with global markets, Southeast Asia's poorer economies are losing comparative advantage in labor-intensive manufacturing and gaining it in natural resources. The first trend may pose a threat to future industrial expansion. The second will generate short-run export windfalls but may not be environmentally sustainable. What are the implications for long-run growth, particularly in the poorest economies, and especially in light of weak institutions for environmental and natural resource management? Rapid resource depletion and reduced industrial growth could expose countries to a period of slow economic growth, as predicted by the "natural resource curse" hypothesis.

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1. THE "CURSE" OF NATURAL RESOURCE WEALTH

"The curse of natural resource wealth" is one of the more colorful phrases to be coined about a major subject in development economics. The "curse" is said to be of slow growth due to a failure to sustain efficient factor use, especially in industrial sectors where the potential for productivity gain is highest. According to Sachs and Warner (2001, p. 828), "... there is virtually no overlap between the set of countries with large natural resource endowments—and the set of countries that have high levels of GDP ... resource intensity tends to correlate with slow economic growth." Since resource abundance has economic meaning only in relation to a country's trading partners (and indeed, is frequently measured as the ratio of resource-based exports to GDP or total trade), the implication is that for a developing economy, comparative advantage in natural resource products can be harmful to growth.

The idea of a resource curse has never resonated loudly in SE Asia, ¹ a resource-abundant region whose largest economies have recorded

exceptionally high growth rates of per capita income since the 1970s. For those SE Asian countries on the lowest rungs of the industrialization ladder, however, recent trends in the global economy, coupled with existing domestic regulatory and institutional weaknesses, now pose both direct and indirect threats to future expansion.

This paper argues that the continued economic success of poorer resource-abundant SE Asian economies is under challenge from a combination of global and domestic conditions. Globally, the continued growth and structural transformation of China, along with its increasing integration in world markets (such as its

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accession to the World Trade Organization (WTO), abolition of Multifiber Arrangement (MFA) garment export quotas, and reduced trade barriers with Japan, East Asia, and ASEAN) is expected to have significant effects on the structure of SE Asian production and trade. China has also emerged as one of the world's largest importers of a wide range of natural resource products. Because of the size of the Chinese economy in relation to world trade, these changes in its imports and exports have the potential to alter world market prices, and as such, to alter the apparent comparative advantage of China's trading partners and competitors. Recent World Bank and IMF analyses have indicated that China's increasing size and involvement in global and regional trade will cause SE Asia's resource-abundant economies to become less specialized in labor-intensive manufacturing such as garments, and more specialized in resource-based exports (Ianchovichina & Martin, 2004; Ianchovichina & Walmsley, 2005; Ng & Yeats, 2003; Weiss & Gao, 2002). These trends reflect implicit changes in comparative advantage. But while the trend in manufactured exports has been documented (Lall & Albaladejo, 2004), that in natural resource exports, and its consequences, has not so far received sustained analytical attention.²

In addressing this issue, this paper first takes note of the rising importance of China as a trading partner to SE Asian economies. It then compares sectoral measures of comparative advantage between China and SE Asia. Bilateral comparisons of these measures provide indicators of the likely evolution of sectoral profitability in SE Asian industries as China becomes more prominent, both globally and as a bilateral trading partner. We draw attention to inter-sectoral and general equilibrium linkages among sectors. The direct effects of demand-driven price changes on sectoral output are well known. Less obviously, the possible contraction of large labor-intensive manufacturing sectors could also increase natural resource exploitation rates, by driving down the price of low-skilled labor.

Natural resource exploitation rates depend not only on relative profitability, but also on the institutional and regulatory conditions governing access to resource stocks. Domestically, regulation of access to and use of forests, fisheries, and agricultural lands in SE Asia have historically been weak. Externalities associated

with resource exploitation, such as the environmental costs of timber depletion and fisheries expansion, are not adequately addressed. In this institutional setting, growth of global demand for resource products, by further encouraging over-exploitation, could lead to a lower-welfare outcome in the long run by causing already high rates of resource depletion to accelerate.

The remainder of the paper begins in Section 2 with a discussion of the "curse" and related evidence. In Section 3, we document the ever-closer trade relationships between SE Asian economies and that of China, and examine the impacts of China's growth on SE Asian trade, primarily through the lens of "revealed" (i.e., *ex post*) comparative advantage. Then, in Section 4, we explore possible ways in which trends in comparative advantage might interact with institutional failures in the region's poorer and less advanced economies. Finally, in Section 5, we draw conclusions and initiate a discussion of development policy implications.

2. THE RESOURCE CURSE: THEORY AND EVIDENCE

(a) *Theory*

Comparative advantage in natural resources, it is argued, contributes to low growth rates and thus to divergence in per capita incomes between resource-rich and resource-poor economies. This finding has been asserted on the basis of econometric results in several prominent papers by Sachs and Warner (1995, 2001). Several explanations can be offered for this phenomenon. First, the "Dutch disease" effects of natural resource exports can inhibit growth in manufacturing, a sector whose expansion is commonly believed to generate positive productivity externalities, giving rise to increasing returns. Slower growth in manufacturing, due to competition for labor and capital from resource sectors and secondary growth in non-traded sectors, would then reduce the economy's potential for dynamic growth.

Second, exploitation of natural resource wealth may reduce returns to human capital investments, and thus diminish incentives for educational attainment (Gylfason, 2001). Resource-rich countries therefore risk falling into a form of low-level equilibrium trap when

attempting to climb product variety or quality ladders in manufacturing, where human capital inputs are increasingly intensively employed on each successive rung.

Third, some political economy papers argue that resource wealth promotes the ascendance of the “predatory state” over the “developmental state,” either by actively encouraging the former through corruption related to resource rents, or by undermining the latter when revenue flows associated with resource extraction reduce the efficiency of policy and administration (Auty, 2001). Arguments of this type have been made with particular force in case studies of Latin American and sub-Saharan Africa (Acemoglu, Johnson, & Robinson, 2002, 2004).

Fourth, lower growth has also been attributed to the destabilizing consequences of Dutch disease. Resource booms cause relative shrinkage in the output of non-resource tradable sectors. The greater concentration of GDP and trade in resource sectors magnifies the effects of global market volatility, as world commodity prices fluctuate much more than do the prices of other goods (Hausmann & Rigobon, 2002).³

Despite the theoretical strength of these arguments, the empirical base for the resource curse hypothesis is not robust. It can be argued that what may appear to be slow growth caused by natural resource wealth is instead produced by other phenomena not directly related to resources. In particular, it is important that the slow growth rates observed by Sachs and Warner are not consistent over time; rather, growth in many resource-abundant economies was very fast in the 1960s and 1970s but decelerated in the 1980s. The structural stability of regression results in which growth rates are averaged over fairly long periods is thus questionable. Slower growth rates in the 1980s, moreover, were not unique to resource-rich economies, and could instead have been the products of debt overhang or other post-oil shock imbalances and incomplete adjustment (Manzano & Rigobon, 2001), in addition to the contemporaneous effects of global commodity price collapses.

Other criticisms of the “curse” hypothesis focus on the econometric strategies from which empirical conclusions about the existence of the curse are derived. One such argument distinguishes between *ex ante* measures of resource abundance and *ex post* resource dependence. *Ex post* measures (e.g., trade inten-

sities) are vulnerable to claims of endogeneity, since they reflect not only the underlying sources of comparative advantage but also policy decisions affecting specific sectors, or trade-related macro variables such as exchange rates.⁴

A third question concerns the definition of abundance (or dependence) and the stability of the group of countries defined as resource abundant or resource dependent. This debate is analogous to that over “openness,” in which a country might be classed as “open” by one set of measures but not by another (e.g., Rodriguez & Rodrik, 1999). By contrast with the approach taken in the trade and growth literature, Sachs and Warner (1995, 2001) do not offer a firm criterion to define “abundance” or “dependence;” however, their conclusions beg the question of how much resource wealth is “too much.”⁵

A reasonable conclusion to be drawn from this review is that while there are strong theoretical grounds to posit a correspondence between resource wealth and low economic growth, the causal link is neither direct nor simple. Moreover, a negative association between resource riches and economic *welfare* (as opposed to per capita income) requires one or more distortions—market failures, policy distortions or institutional failures. It may be that each resource-abundant country experiences its own resource wealth-growth relationship, based on unique institutional and economic characteristics, but that all such experiences lead to similar outcomes.⁶

(b) *How SE Asia avoided the curse*

All of the theoretical symptoms of a resource curse can be seen in some form in each resource-abundant SE Asian country. Paradoxically, however, the region’s largest resource-rich economies have in fact grown very rapidly by world standards. Figure 1 shows average per capita growth rates (1975–2001) for the group of countries in which primary exports made up at least 60% of merchandise exports in 1971. Lines drawn at the mean growth rate and export intensity divide the figure into four quadrants. It can be seen that Malaysia, Indonesia, and Thailand (together with Chile and Sri Lanka) form a distinct group which, though initially of above-average resource-dependence, experienced average GDP growth rates in 1975–2001 notably higher than the mean for

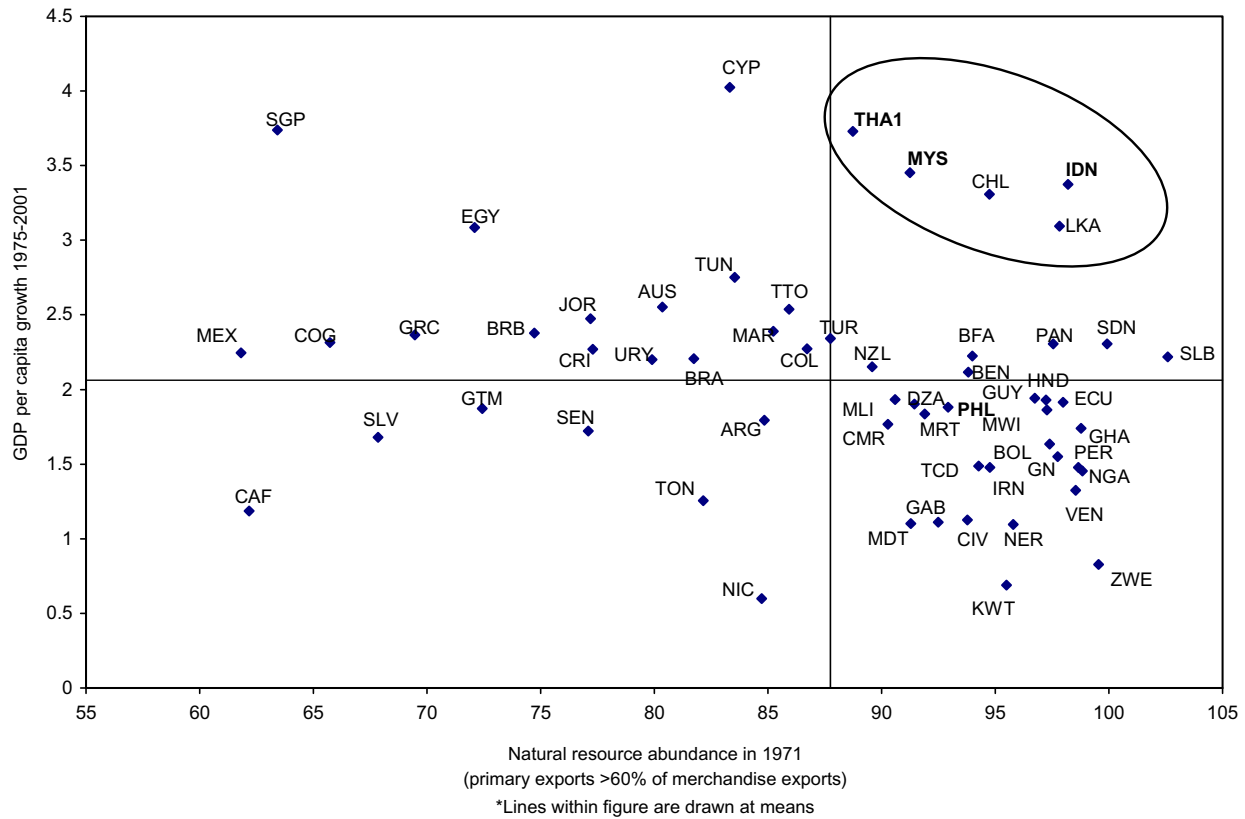


Figure 1. *Natural resource abundance and per capita growth rates* Source of basic data: World Bank, *World Development Indicators Online*. For data and key to country codes go to <http://www.aae.wisc.edu/coxhead/papers/nrcl/appendix.ppt.htm>.

this sample of countries. Therefore, if the resource curse does apply to developing countries in general, then the economies of this region have undergone some other development experience which more than compensates for its effects.

The most obvious explanation is the post-Plaza Accord boom in foreign direct investment (FDI) into the region; net FDI flows to SE Asia (excluding Singapore) jumped from \$US1.1bn in 1985 to more than \$US7.2bn in 1991. This massive increase in capital inflows initiated a decade of labor-intensive industrialization and ensured the inclusion of Thailand, Malaysia, and Indonesia in the World Bank's group of eight "East Asian miracle" economies, alongside the resource-poor and industrially more advanced Singaporean and Northeast Asian economies. Not only did these three economies grow very rapidly and in a sustained fashion over more than a decade after 1986, they also underwent structural changes that dramatically reduced their relative reliance on natural resources. By the early 1990s, all of SE Asia's market economies exported far more

manufactures by value than agricultural and natural resource products. For these economies, then, it appears that the rapid expansion of labor-intensive manufactures from the mid-1980s, driven in large part by heavy FDI inflows, forestalled the resource curse. For nearly all other resource-abundant developing economies, the 1980s were a "lost decade" in which export price falls, high and rising debt service costs, and net capital outflows led to sustained low or negative rates of GDP growth. By contrast, SE Asia's resource-rich economies (except the Philippines) experienced growth slowdowns (or for some, mild recessions in 1985) followed by a decade of expansion at historically rapid rates.

Since the late 1990s, however, the region has experienced a significant decline in labor-intensive manufactures, while the demand for natural resource exports has boomed. These trends affect each country differently, given variation in economic structure and trade patterns. Could some economies still succumb to the resource curse? In the next two sections, we first explore the shift in comparative advantage, then exam-

ine ways in which such a shift might interact with known market and institutional failures to produce a “new” resource curse outcome.

3. SE ASIAN RESPONSES TO CHINESE GROWTH

(a) *Evolution of intra-regional trade*

Intra-East Asia⁷ trade volumes have expanded enormously since the 1980s. East Asia–China trade is an increasingly important component of intra-regional trade, rising from less than 1% of the total in 1975 to 10% in 2001, and 13% in 2004 (UN Comtrade, 2006). China produces almost half of regional GDP and one third of its exports (Ng & Yeats, 2003, p. 9). China’s growth, sustained at above 7% per year since 1980, is a major driver of regional trade growth. The Chinese economy has also become far more trade-dependent since the late 1980s, a shift caused by many factors, not least of which are the country’s accession to the WTO and the liberalization of trade with its regional neighbors, including ASEAN.

In the 1990s, ASEAN’s share in China’s total imports rose from 6% to 9%, a 390% increase in value terms (Ianchovichina & Walmsley, 2005). ASEAN economies saw big increases in the

share of their regional trade going to China, and the value of their exports to China rose much faster than total exports (Table 1, and see Ng & Yeats, 2003, Table 6.1). Some new trade from SE Asia to China is in medium-tech manufactures, specifically semiconductors and other computer components, especially from the more advanced economies (Singapore, Malaysia, Philippines, and Thailand). But a large and rapidly growing share of the trade is in natural resource products, and this dominates trade from the poorer countries of the region (Indonesia, Vietnam, Laos, Cambodia, and Burma). Figure 2 summarizes the sectoral comparison of regional exports to the world and to China.

China’s expansion has raised demand and contributed to global price rises for all types of agricultural and natural resource products. This boom affects Brazilian soybean producers, Chilean copper miners, and energy producers everywhere, but SE Asia’s resource abundance and geographic proximity make the region a leading beneficiary. The area in the region planted to plantation crops—oil palm, rubber, coffee, and others—has increased phenomenally since 1990 (Coxhead, 2003). Coastal and marine fisheries, as well as inland and estuarine fish-farming, have grown equally rapidly, and so have large sectors of the mining industry.

Table 1. *China’s share of SE Asian trade (per cent) and rank among trading partners*

Country		1990	2000	2002	2004
Malaysia	Exports	2.10 (9)	3.09 (9)	5.63 (5)	6.69 (4)
	Imports	1.92 (7)	3.94 (5)	7.74 (4)	9.91 (4)
Indonesia	Exports	3.25 (5)	4.46 (5)	5.08 (5)	7.54 (3)
	Imports	2.97 (7)	6.03 (5)	7.76 (4)	11.00 (2)
Philippines	Exports	0.75 (10)	1.74 (10)	3.85 (8)	11.44 (3)
	Imports	1.40 (9)	2.28 (9)	3.53 (7)	7.39 (4)
Thailand	Exports	1.16 (9)	4.07 (6)	5.16 (5)	7.29 (3)
	Imports	3.31 (6)	5.45 (4)	7.61 (3)	8.58 (2)
Viet Nam	Exports	0.31 (6)	10.61 (2)	9.09 (3)	8.42 (3)
	Imports	0.16 (8)	8.96 (4)	10.93 (4)	13.56 (1)
Cambodia	Exports	0.39 (5)	2.12 (5)	1.26 (9)	1.15 (10)
	Imports	5.91 (4)	7.93 (3)	10.84 (4)	13.46 (3)
Myanmar (a)	Exports ^a	8.14 (4)	5.65 (4)	4.69 (4)	6.23 (3)
	Imports	20.62 (1)	17.97 (2)	27.02 (1)	28.28 (1)
Laos (a)	Exports ^a	9.08 (2)	1.24 (10)	2.27 (9)	2.26 (7)
	Imports	10.72 (4)	5.49 (3)	8.20 (3)	9.19 (2)

Source: Asian Development Bank: *Key Indicators* (<http://www.adb.org/Statistics/>), accessed February 2006.

^a Though accurate data are unobtainable, it is clear that exports to China from Laos and Myanmar—and especially those of timber and other resource products—are greatly understated. In 2002, for example, China reported 500,000 cu.m. of log imports from Myanmar, while none were reported exported from Myanmar to China (www.itto.or.jp, accessed May 2006).

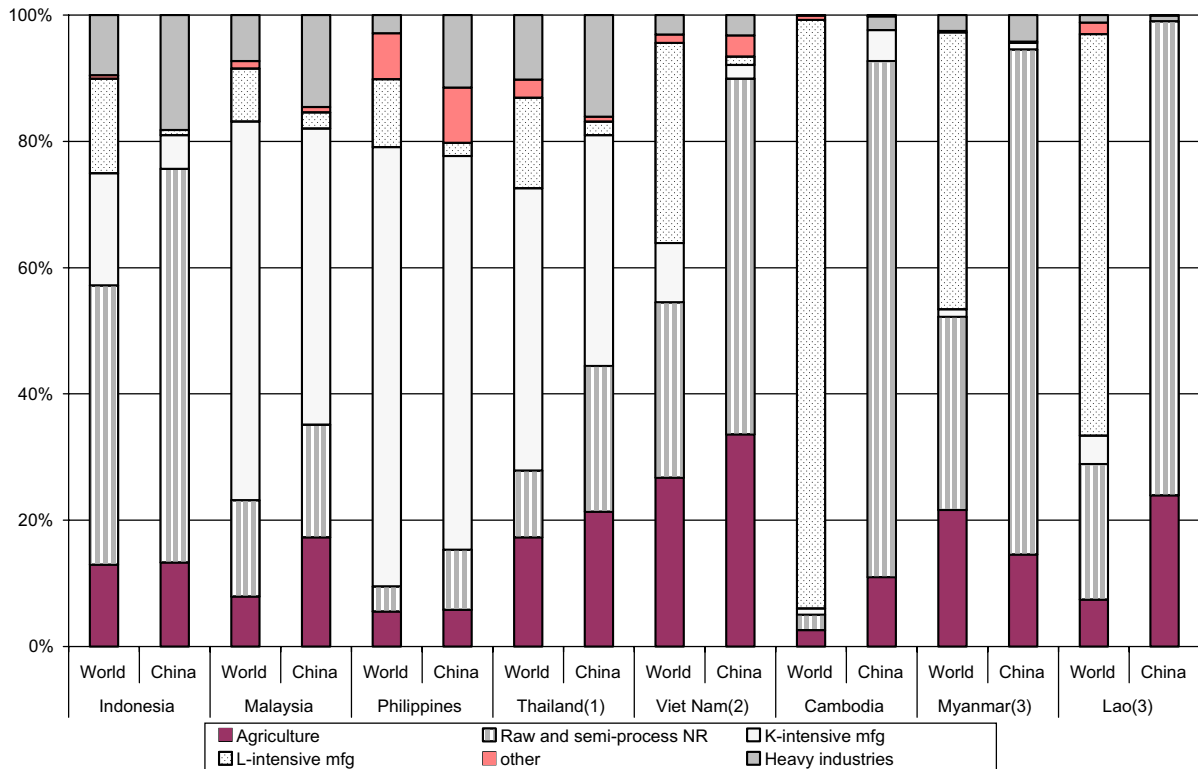


Figure 2. Sectoral composition of SE Asian exports to the world and to China, 2000–04 average. Source: UN Comtrade. Notes: (1) Thailand data 2000–03 only. (2) Vietnam data 2000–03 only. (3) Export data unavailable; calculated from foreign import data.

Table 2. Southeast Asian competition with China in the US market (per cent overlap in product categories, aggregated using value weights)

Country	1990	1995	2000
Singapore	14.8	19.2	35.8
Indonesia	85.3	85.5	82.8
Malaysia	37.1	38.9	48.7
Philippines	46.3	47.8	46.1
Thailand	42.2	56.3	65.4

Source: Kwan (2002, Table 2).

Timber extraction has been especially highly affected. China's forest product imports—logs, lumber, pulp and paper, plywood, veneer, and woodchips—more than doubled from 1997 to 2003 (Sun, Katsigris, & White, 2004). Imports accelerated after China implemented restrictions on domestic logging under the National Forest Protection Program (1998) and liberalized timber import tariffs in the lead up to its 2001 WTO accession. Much of the new trade has been met by increased imports from Russia, but Indonesia, Malaysia, and Thailand continue to supply a large fraction of the total. Indonesia, for example, has increased its legal forest product exports to China by about 60%

since 1997. As China builds domestic processing capacity, moreover, the largest increases by far have come in unprocessed logs and lumber, plywood, once the major export, has declined (Sun *et al.*, 2004).

(b) Competition in global markets

Bilateral trade aside, China's growth has been large enough in relation to global markets for some products that it also has indirect effects on SE Asia, both through its impacts on global prices and through global trade policy changes affecting trade volumes and market share. In manufacturing, China's expansion is

having mixed effects on SE Asia (Eichengreen *et al.*, 2004; Lall & Albaladejo, 2004; Mulapruck & Coxhead, 2005). The dismantling of the Multifiber Arrangement (MFA) removed a distortion that disproportionately penalized China's exports.⁸ Abolition of MFA export quotas in 2005 led to a surge in Chinese garment exports to the US and EU markets.⁹ China's WTO accession, which both increased export market access and reduced the cost of imported intermediates to its manufacturers, undermined the international competitiveness of key SE Asian manufacturing sectors (Ianchovichina & Martin, 2004; Ianchovichina & Walmsley, 2005). Furthermore, if the direction of future FDI flows matches the shifting pattern of production, then China's lead in these sectors can be expected to widen further in the longer run.

How important are these trends? The answer depends, in part, on the extent to which China and SE Asian countries compete or complement one another in trade. *Ex ante* measures based on factor endowments are poor predictors of trade patterns (Trefler, 1995); consequently, the empirical literature relies heavily on *ex post* measures. One such measure is the extent of overlap in export product categories. A recent study using this measure shows a high overlap between China's exports and those of Indonesia, and rising overlap between China and exports from other SE Asian economies except the Philippines (Table 2). The degree of overlap has been increasing as Chinese manufacturing expands (increasing the number of product lines exported) and becomes more capital-intensive (Kwan, 2002; Weiss & Gao, 2002).¹⁰

Measures of revealed comparative advantage (RCA; Balassa, 1965) provide more detailed indications of multilateral trade intensity. The RCA measures the intensity of a country's exports of a good relative to the intensity of world exports of that good. For country j , good k , and time period t , the RCA is defined as $RCA_{jkt} = \frac{X_{kt}^j / X_{kt}^j}{X_{kt}^W / X_{kt}^W}$, where K denotes the sum of all exports from country j or the world (W), respectively. By this definition, $RCA_{jkt} > 1$ means that the share of product k in the exports of country j in year t is greater than its share in total world exports in the same year. It is conventional to interpret RCA_{jkt} values greater than 1 as meaning that country j has a comparative advantage in the production of good k , and those less than 1 as indicating a comparative disadvantage.¹¹ RCA values can be computed from data collected by the UN Statistics

Office and reported by Standard Industrial Trade Classification, or SITC (UN Comtrade, 2006). We use these data at the two-digit aggregation level, which contains 67 divisions (i.e., distinct product categories) in 10 sections.

Table 3 reports RCA measures computed from the most recent available data for China and several SE Asian countries. Values greater than 1 are shown in bold type. China has low RCA values for most agricultural products (SITC sections 0, 1, 4 and division 22) and natural resource products (SITC sections 2, 3 and division 68) other than coal and fertilizer, but very high values for all kinds of assemblies (SITC 71–81, notably electrical equipment, electronics, computers and components, and office equipment), for furniture (SITC 82), and for garments, footwear, and accessories (SITC 83–85).

Within SE Asia, Indonesia, Thailand, and Vietnam have the greatest range of high RCA values in agriculture and resource sectors. Like China, these economies also show a clear evidence of comparative advantage in labor-intensive industries like furniture, garments, footwear, bags and accessories, electrical appliances, and electronics. Moreover, these are sectors from which very large shares of each country's total exports are derived.

The country data for RCA and the composition of exports are shown in Figures 3–8. For each SITC division listed on the horizontal axis, these graphs show the RCA value on the vertical axis; its percentage share in total merchandise exports is given by the size of the "bubble." To reduce clutter, only those SITC divisions with exports greater than 1% of total exports have been graphed.

Not surprisingly, products with the highest RCA values are also those that account for the largest shares of a country's exports, as seen in the figure by the size of each export share bubble. China derives nearly all its export revenues from a diversified set of industries within SITC 7 and 8 (Figure 3). The Philippines and Malaysia, both of which earned more than 75% of their export revenues from primary products as recently as 1980,¹² are now both heavily concentrated in medium-tech industries such as computer components and electrical and electronic goods (Figures 4 and 5). Although Malaysia has substantial comparative advantage in palm oil, rubber, and some timber products, these contribute little to its total exports. Thailand (Figure 6) also depends on manufactured exports, though it also derives

Table 3. *RCA values (2000–04 average) for China and Southeast Asia*

Name	SITC code ^a	CHN	VNM	IDN	THA ^b	PHL	MYS
Live animals	00	0.73	0.13	0.39	0.23	0.05	0.69
Meat and meat preparations	01	0.57	0.20	0.05	1.83	0.01	0.04
Dairy products and birds' eggs	02	0.06	1.07	0.25	0.26	0.25	0.22
Fish, crustaceans, etc.	03	1.88	12.38	3.71	7.66	1.59	0.56
Cereals and cereal preparations	04	0.63	4.33	0.19	3.16	0.13	0.21
Vegetables and fruits	05	1.11	2.10	0.47	1.63	1.77	0.20
Sugars, sugar preparations	06	0.41	0.79	0.47	4.67	0.88	0.44
Coffee, tea, cocoa, spices	07	0.45	7.17	4.30	0.24	0.10	0.89
Feeding stuff for animals	08	0.34	0.14	0.55	1.33	0.30	0.37
Miscellaneous edible products	09	0.60	1.07	0.84	1.56	0.46	0.94
Beverages	11	0.22	0.08	0.04	0.22	0.11	0.20
Tobacco and tobacco manufactures	12	0.38	0.84	1.30	0.27	0.54	0.69
Hides, skins, and furskins, raw	21	0.03	0.26	0.03	0.03	0.04	0.06
Oil seeds and oleaginous fruits	22	0.61	1.15	0.12	0.06	0.01	0.05
Crude rubber	23	0.15	7.53	13.91	18.10	0.41	5.26
Cork and wood	24	0.29	0.45	1.39	0.50	0.13	2.73
Pulp and waste paper	25	0.01	0.00	3.77	0.63	0.33	0.00
Textile fibers (not yarn or fabric)	26	0.90	0.19	0.88	1.27	0.19	0.28
Crude fertilizers and minerals nes	27	1.57	0.32	0.75	1.76	0.25	0.21
Metalliferous ores and metal scrap	28	0.08	0.31	4.53	0.26	0.85	0.11
Crude animal and vegetable materials, nes	29	1.18	0.85	0.54	0.61	0.82	0.14
Coal, coke, and briquettes	32	3.29	1.98	8.92	0.00	0.00	0.00
Petroleum and petroleum products	33	0.21	2.66	1.83	0.41	0.18	0.97
Gas, natural and manufactured	34	0.06	0.00	7.50	0.32	0.07	3.22
Electric current	35	1.04	0.04	0.00	0.00	0.00	0.05
Animal oils and fats	41	0.09	0.04	0.09	0.07	0.02	0.02
Vegetable fats and oils, refined	42	0.10	0.64	14.35	0.42	4.60	13.21
Animal or vegetable fats and oils, processed	43	0.08	0.06	4.25	1.00	0.97	17.10
Organic chemicals	51	0.49	0.07	0.80	0.51	0.10	0.63
Inorganic chemicals	52	1.62	0.07	0.61	0.24	0.18	0.26
Dyeing and tanning materials	53	0.67	0.06	0.34	0.27	0.08	0.38
Medicinal and pharmaceutical products	54	0.25	0.02	0.06	0.08	0.02	0.03
Essential oils and resinoids	55	0.22	0.34	0.69	0.69	0.16	0.33
Fertilizers (other than those of group 272)	56	0.67	0.27	1.07	0.13	0.61	0.68
Plastics in non-primary forms	58	0.29	0.15	0.61	0.61	0.21	0.51
Chemical materials and products, nes	59	0.51	0.24	0.30	0.59	0.12	0.56
Leather, leather manufactures nes	61	1.28	0.26	0.42	1.68	0.04	0.11
Rubber manufactures, nes	62	0.77	0.37	1.07	1.59	0.27	0.54
Cork and wood manufactures, excluding furniture	63	1.27	0.89	8.86	1.12	0.76	3.21
Paper and paperboard	64	0.31	0.20	2.15	0.53	0.14	0.22
Textile yarn, fabrics and articles, nes	65	2.54	0.77	2.14	1.10	0.31	0.45
Non-metallic mineral manufactures, nes	66	0.85	0.45	0.60	1.10	0.23	0.33
Iron and steel	67	0.61	0.12	0.37	0.54	0.03	0.41
Non-ferrous metals	68	0.77	0.07	1.13	0.30	0.62	0.50
Manufactures of metals, nes	69	1.67	0.29	0.41	0.76	0.18	0.45
Power-generating machinery	71	0.38	0.12	0.28	0.61	0.07	0.26
Machinery specialized for particular industry	72	0.29	0.12	0.10	0.17	0.15	0.26
Metalworking machinery	73	0.35	0.03	0.04	0.23	0.21	0.22
Industrial Machinery and equipment, nes	74	0.71	0.05	0.19	0.86	0.15	0.36
Office and data processing machines	75	2.28	0.41	0.78	2.20	3.86	3.62
Telecommunication apparatus and equipment	76	2.11	0.14	1.18	1.27	0.69	2.53
Electrical machinery and appliances, nes	77	1.11	0.27	0.50	1.62	4.77	2.86
Road vehicles	78	0.27	0.08	0.11	0.47	0.27	0.05

Table 3—continued

Name	SITC code ^a	CHN	VNM	IDN	THA ^b	PHL	MYS
Other transport equipment	79	0.28	0.02	0.06	0.17	0.12	0.13
Preferable buildings and construction nes	81	2.38	0.15	0.35	0.64	0.31	0.21
Furniture, and parts thereof	82	1.92	1.76	2.46	1.30	0.83	1.51
Travel goods, handbags, and similar	83	4.96	3.48	0.80	2.00	1.80	0.06
Articles of apparel and clothing	84	4.15	3.74	2.38	1.66	1.98	0.70
Footwear	85	4.47	11.49	3.06	1.49	0.20	0.17
Professional and scientific instruments	87	0.59	0.07	0.05	0.24	0.17	0.62
Photographic apparatus & watches	88	1.23	0.18	0.28	1.05	0.99	0.80
Miscellaneous manufactured articles, nes	89	2.04	0.46	0.56	1.05	0.41	0.60

Computed from definition in the text. Values greater than 1 (**bold**) denote comparative advantage.

Source: UN Comtrade.

^a SITC 3 product categories.

^b 2000, 2001, 2003 only.

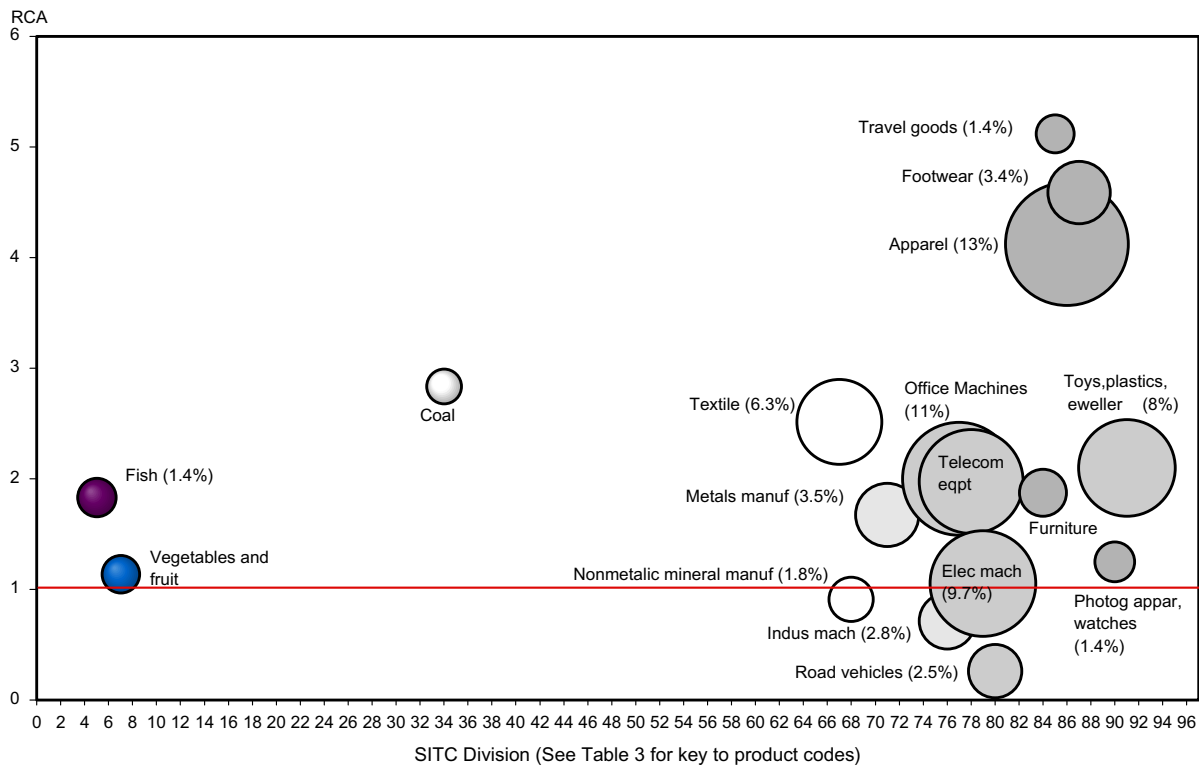


Figure 3. China: RCA and composition of major merchandise exports, 2000–03.

a considerable share of export income from agriculture (SITC 0) and rubber (SITC 22). By contrast, Vietnam (Figure 7) and Indonesia (Figure 8) are seen to be both resource-abundant and resource-dependent: agriculture, fisheries, and natural resource products have large shares in total exports. Within manufactures, both depend heavily on labor-intensive products such as garments, footwear, and accessories, although resource-based semi-manufactures such as sawnwood, plywood, paper, and crude textiles are also important earners for Indonesia.

(c) Trends in bilateral comparative advantage

The RCA measures compare country export intensities by reference to global exports. We have seen, however, that bilateral trade shares between ASEAN and China are rapidly rising (Table 1). Moreover, the contrasts between the composition of SE Asian exports to China and those to the world as a whole (Figure 2) motivate a different question: how will China’s emergence as a leading trading partner influence regional export patterns? As the figure indicates, this question is most relevant for

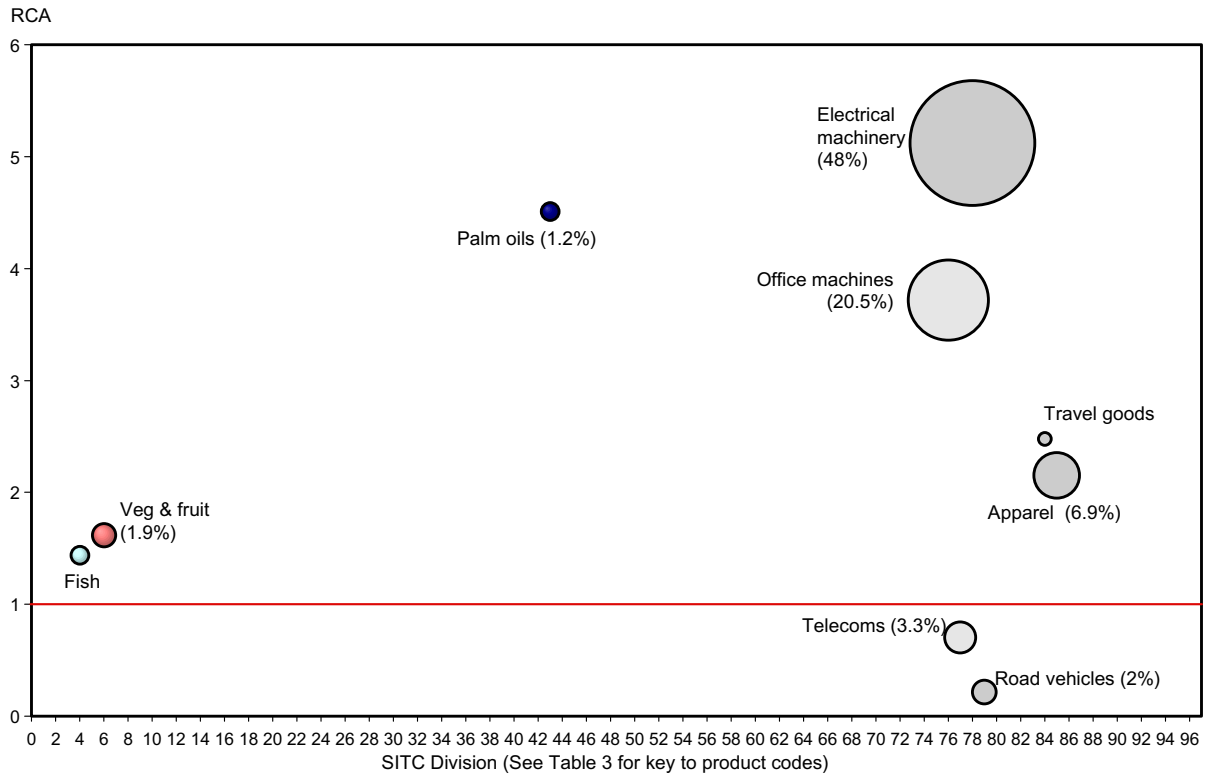


Figure 4. *Philippines: RCA and composition of major merchandise exports, 2000–02.*

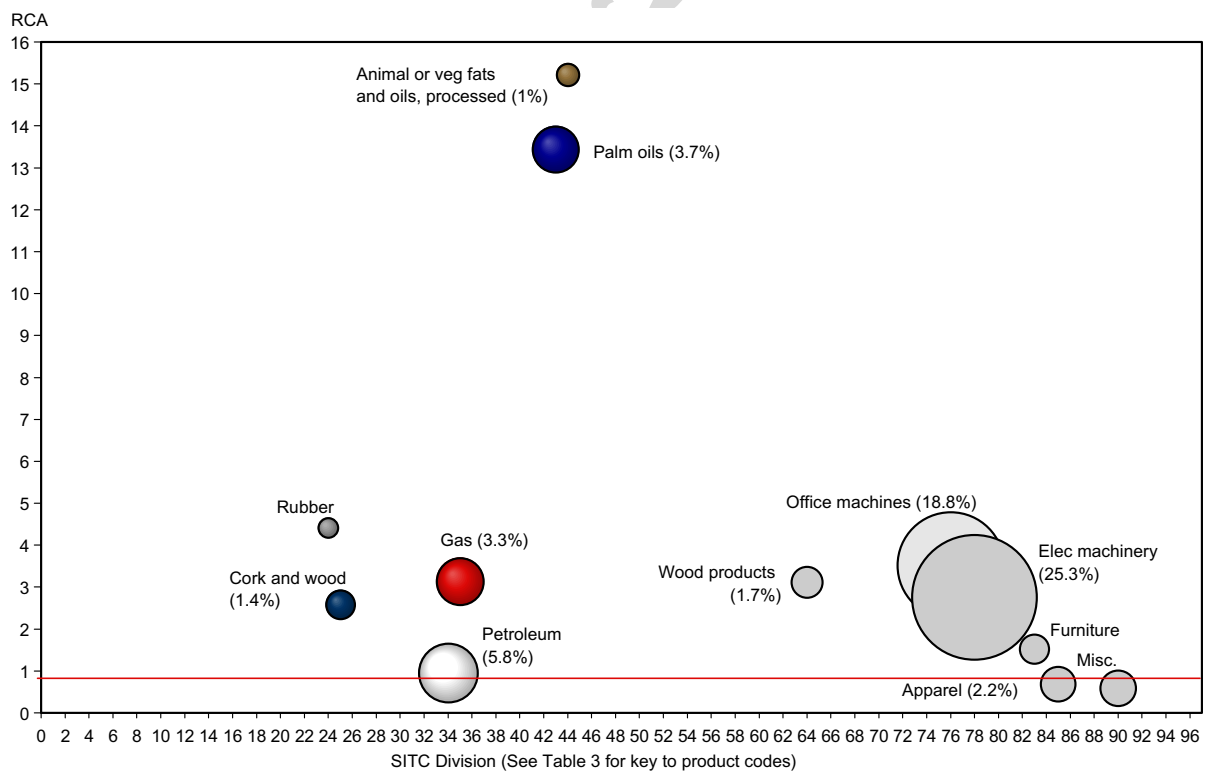


Figure 5. *Malaysia: RCA and composition of major merchandise exports, 2000–03.*

Laos, Myanmar, and Vietnam, all of which share land borders with China, and for Indone-

sia, whose exports are very heavily dependent on natural resource products.

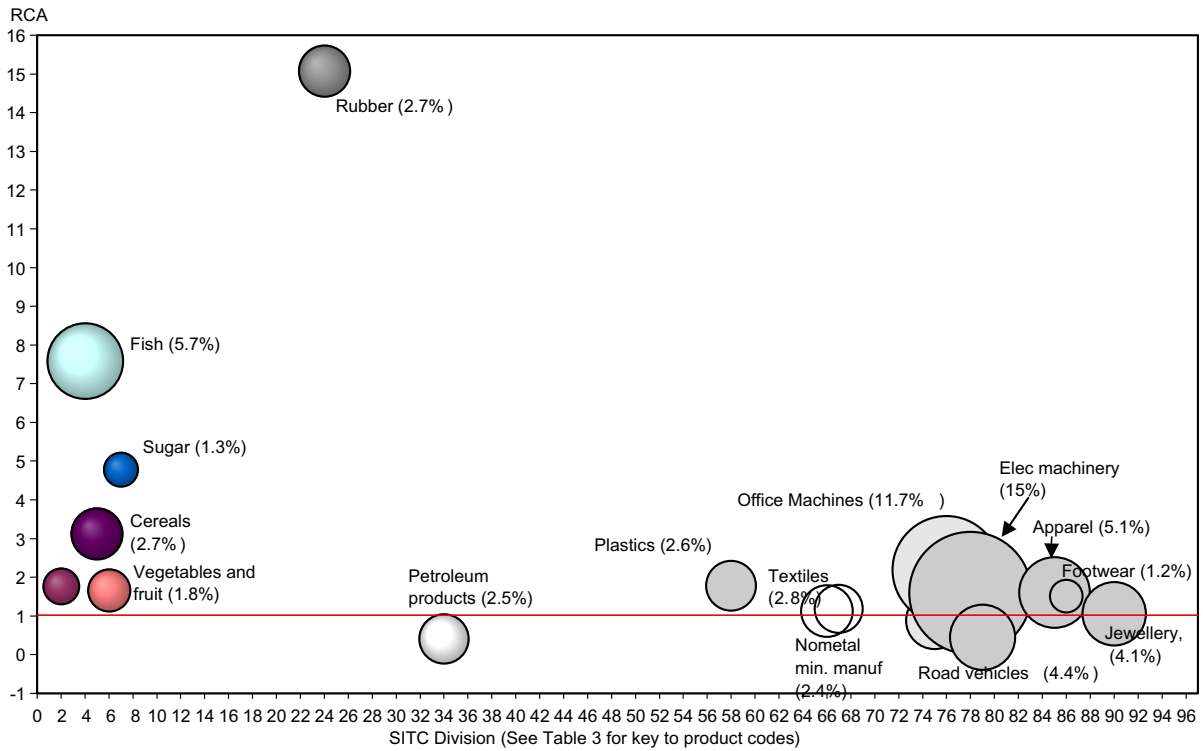


Figure 6. Thailand: RCA and composition of major merchandise exports, 2000-03.

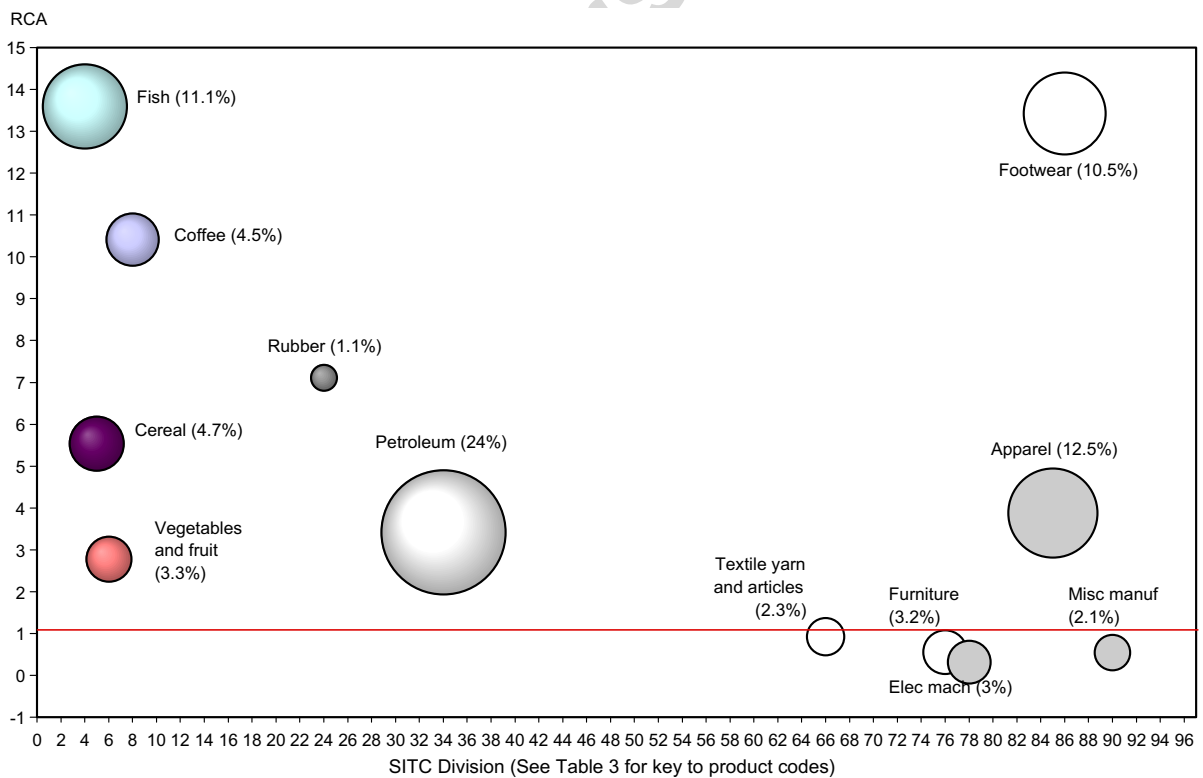


Figure 7. Vietnam: RCA and composition of major merchandise exports, 2000-01.

To obtain indicators of possible future trends, it helps to examine the relative comparative advantage of China and each SE Asian economy. Such a comparison can indicate the

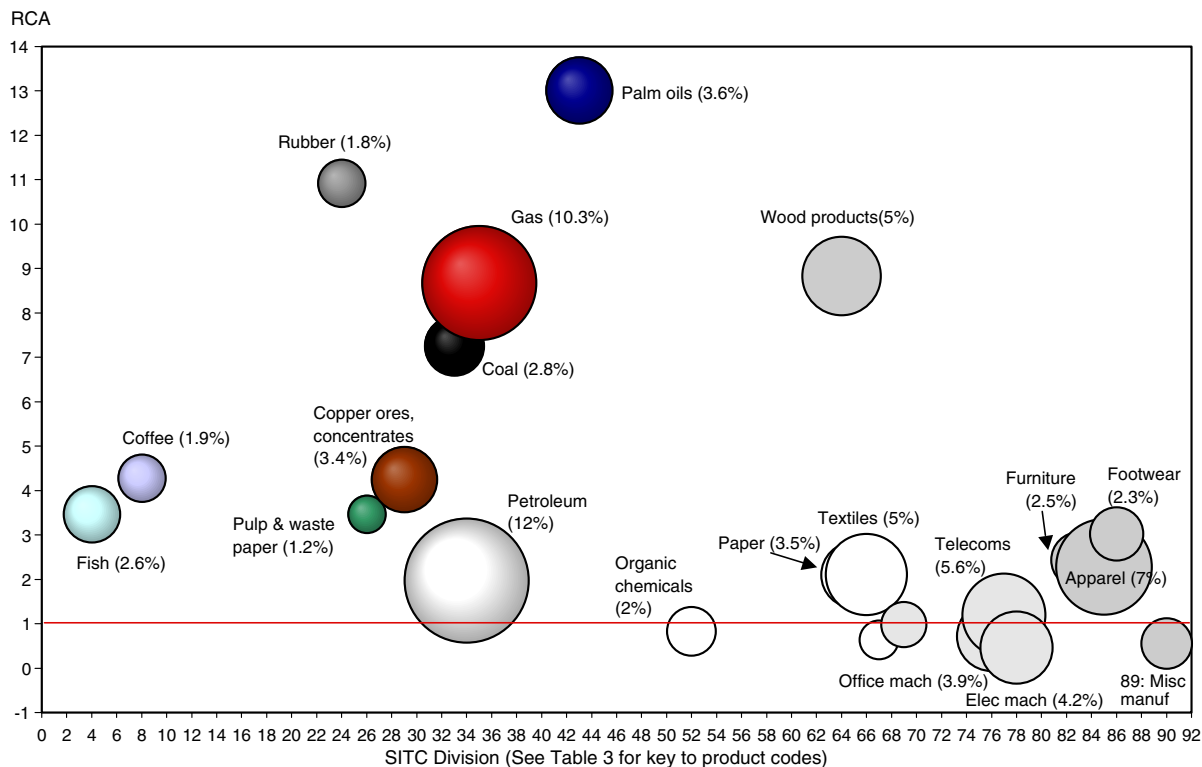


Figure 8. Indonesia: RCA and composition of major merchandise exports, 2000–03.

likely direction of changes in SE Asian export composition as China gains prominence both as a bilateral trading partner and as a global competitor. This comparison is made by subtracting China's *RCA* value in each SITC division from the corresponding value for each SE Asian economy. The results, again using 2000–04 averages of trade data, are shown in Table 4. In this table, numerical values greater than zero indicate a larger *RCA* value in a SE Asian economy than in China. Other things being equal, bilateral trade expansion will cause the output of these products to rise. Negative values, by contrast, indicate a greater *RCA* in China than in the corresponding SE Asian country; other things being equal, a rise in China's trade share will cause SE Asian output of these industries to decline. The data are thus suggestive of the export pattern that would be seen in each SE Asian country were it to trade *only* with China, or more helpfully, of the pattern of competition and complementarity of each SE Asian economy with China in the global market.

The bilateral data display clear patterns for three industry groups. First, countries with strong comparative advantage in medium-tech and high-tech industries such as electronics will see some exports expand as China grows; this pattern can be seen in the Philippines and Malaysia, and to a lesser extent in Thailand.

This bilateral trade can be expected to benefit from the lowering of transport costs and trade barriers within East Asia, and from the expansion of internationally fragmented production, mainly of computers and electronic appliances. Second, with the exception of the Vietnamese footwear industry, producers of garments, footwear, and other labor-intensive goods will tend to contract as China grows. While causality cannot strictly be assigned, this direction of change is starkly visible for Thailand, Vietnam, and Indonesia by comparison with their global export patterns. Third, exports of natural resources and agriculture—oil palm and rubber, lumber, oil and gas, and many kinds of farm and fishery products—will all expand.

The comparative *RCA* data are consistent with the observation that the less advanced SE Asian economies are becoming major suppliers of natural resource products to the Chinese market, and in return importing a wide range of manufactures from China. This is clear for Indonesia and Vietnam, the countries in this category for which data are available, but can confidently be extrapolated to Cambodia, Laos, and Myanmar—for which reliable data are not available—on the strength of these countries' resource endowments and their location in relation to China. It should be stressed, however, that in each case it is not necessary

Table 4. *Southeast Asia–China RCA Differential (2000–04 average)**

Name	SITC code ^a	VNM	IDN	THA ^b	PHL	MYS
Live animals	00	-0.60	-0.35	-0.50	-0.68	-0.05
Meat and meat preparations	01	-0.37	-0.51	1.27	-0.56	-0.53
Dairy products and birds' eggs	02	1.02	0.20	0.20	0.19	0.17
Fish, crustaceans, etc.	03	10.50	1.83	5.78	-0.29	-1.32
Cereals and cereal preparations	04	3.70	-0.45	2.53	-0.51	-0.43
Vegetables and fruits	05	0.99	-0.64	0.52	0.66	-0.91
Sugars, sugar preparations	06	0.38	0.05	4.25	0.47	0.02
Coffee, tea, cocoa, spices	07	6.72	3.85	-0.21	-0.35	0.44
Feeding stuff for animals	08	-0.20	0.21	0.99	-0.04	0.03
Miscellaneous edible products	09	0.48	0.25	0.96	-0.14	0.35
Beverages	11	-0.14	-0.18	0.01	-0.11	-0.02
Tobacco and tobacco manufactures	12	0.46	0.92	-0.11	0.16	0.31
Hides, skins, and furskins, raw	21	0.23	0.00	0.00	0.00	0.02
Oil seeds and oleaginous fruits	22	0.54	-0.49	-0.55	-0.60	-0.57
Crude rubber	23	7.38	13.76	17.95	0.26	5.11
Cork and wood	24	0.17	1.10	0.21	-0.16	2.44
Pulp and waste paper	25	-0.01	3.76	0.62	0.32	-0.01
Textile fibers (not yarn or fabric)	26	-0.71	-0.03	0.37	-0.71	-0.62
Crude fertilizers and minerals nes	27	-1.25	-0.82	0.19	-1.32	-1.36
Metalliferous ores and metal scrap	28	0.23	4.45	0.18	0.77	0.03
Crude animal and vegetable materials, nes	29	-0.33	-0.64	-0.57	-0.36	-1.04
Coal, coke, and briquettes	32	-1.31	5.63	-3.29	-3.29	-3.29
Petroleum and petroleum products	33	2.45	1.61	0.19	-0.04	0.76
Gas, natural and manufactured	34	-0.06	7.44	0.26	0.02	3.16
Electric current	35	-1.00	-1.04	-1.04	-1.04	-0.99
Animal oils and fats	41	-0.05	0.00	-0.02	-0.07	-0.07
Vegetable fats and oils, refined	42	0.53	14.24	0.32	4.50	13.10
Animal or vegetable fats and oils, processed	43	-0.01	4.18	0.93	0.90	17.02
Organic chemicals	51	-0.41	0.32	0.02	-0.39	0.14
Inorganic chemicals	52	-1.55	-1.01	-1.38	-1.44	-1.36
Dyeing and tanning materials	53	-0.61	-0.33	-0.40	-0.59	-0.29
Medicinal and pharmaceutical products	54	-0.23	-0.19	-0.17	-0.23	-0.22
Essential oils and resinoids	55	0.11	0.47	0.46	-0.06	0.11
Fertilizers (other than group 272)	56	-0.41	0.40	-0.54	-0.07	0.00
Plastics in primary forms	57	-0.14	0.46	1.66	-0.09	0.57
Plastics in non-primary forms	58	-0.14	0.32	0.31	-0.08	0.22
Chemical materials and products, nes	59	-0.26	-0.20	0.08	-0.38	0.05
Leather, leather manufactures nes	61	-1.03	-0.86	0.40	-1.25	-1.18
Rubber manufactures, nes	62	-0.39	0.30	0.82	-0.50	-0.23
Cork and wood manufacture, excluding furniture	63	-0.38	7.59	-0.15	-0.51	1.95
Paper and paperboard	64	-0.11	1.83	0.22	-0.17	-0.09
Textile yarn, fabrics and articles, nes	65	-1.77	-0.40	-1.43	-2.23	-2.09
Non-metallic mineral manufacture, nes	66	-0.40	-0.25	0.26	-0.61	-0.51
Iron and steel	67	-0.49	-0.25	-0.07	-0.58	-0.20
Non-ferrous metals	68	-0.70	0.35	-0.47	-0.15	-0.27
Manufactures of metals, nes	69	-1.39	-1.27	-0.91	-1.49	-1.22
Power-generating machinery	71	-0.26	-0.10	0.23	-0.31	-0.13
Machinery specialized for particular industries	72	-0.17	-0.19	-0.12	-0.14	-0.03
Metalworking machinery	73	-0.32	-0.31	-0.12	-0.14	-0.13
Industrial machinery and equipment, nes	74	-0.66	-0.52	0.15	-0.56	-0.35
Office and data processing machines	75	-1.87	-1.50	-0.08	1.58	1.34
Telecommunication apparatus and equipment	76	-1.97	-0.93	-0.84	-1.42	0.42
Electrical machinery and appliances, nes	77	-0.83	-0.61	0.52	3.66	1.75

(continued on next page)

Table 4—continued

Name	SITC code ^a	VNM	IDN	THA ^b	PHL	MYS
Road vehicles	78	-0.19	-0.16	0.20	0.00	-0.22
Other transport equipment	79	-0.25	-0.21	-0.11	-0.15	-0.14
Preferable buildings & construction nes	81	-2.23	-2.03	-1.74	-2.07	-2.17
Furniture, and parts thereof	82	-0.16	0.54	-0.62	-1.09	-0.41
Travel goods, handbags, and similar	83	-1.47	-4.16	-2.96	-3.16	-4.90
Articles of apparel and clothing	84	-0.41	-1.77	-2.50	-2.17	-3.46
Footwear	85	7.02	-1.41	-2.98	-4.27	-4.31
Professional and scientific instruments	87	-0.53	-0.54	-0.35	-0.42	0.03
Photographic apparatus and watches	88	-1.05	-0.95	-0.18	-0.24	-0.43
Miscellaneous manufactured articles, nes	89	-1.58	-1.48	-0.98	-1.63	-1.43

Source: UN Comtrade.

^a SITC 3 product categories.

^b 2000, 2001, 2003 only.

* Data obtained by subtracting China's *RCA* value from that of each country. Values greater than zero denote comparative advantage *relative to China*.

that the exports of natural resource sectors actually go to China (although in practice an increasing share does, most especially China's immediate neighbors). The comparative *RCA* data provide indicative predictions of the trend of each country's *global* comparative advantage *relative to* that of China.

The drivers of these shifts in the structure of SE Asian production and trade are potentially large, and operate both directly and indirectly. To the extent that increased export supply (for example of garments) from China depresses global market prices, it confers a negative externality on other garment-exporting countries. Global trade model simulations indicate that the cumulative effects of China's WTO accession over the 2001–10 period will be negative for real GDP growth in developing SE Asian countries, though with mixed sectoral and country stories. The two big winners are natural resource sectors and high-tech industries. The clear losers are apparel, textiles, and some industries of medium capital intensity, such as automobiles; apparel exports are predicted to fall by 20–25%, depending on the country (Ianchovichina & Walmsley, 2005). Vietnam, heavily dependent on apparel and with few complementary manufacturing sectors, is predicted to experience the greatest loss, about 0.4% of GDP. For Indonesia, an earlier economy-wide analysis of the effects of China's WTO accession predicted marginally slower growth of GDP as a whole, but faster growth in forestry, minerals and agriculture and in some secondary industries using these as inputs (Strutt & Anderson, 2000). This analysis also

predicted a large decline (23.4%) for the textiles, clothing, and leather sectors.

Because a very large fraction of the SE Asian manufacturing labor force is currently employed in garments, footwear, and other labor-intensive low-tech industries that compete with Chinese exports, indirect effects will be felt through adjustments in the markets for labor and other factors. In Indonesia, for example, textile and apparel production accounts for 25% of employment in large and medium manufacturing industries (James *et al.*, 2003), or about 3 m workers. An employment decline matching the one-fourth drop in output predicted by Strutt and Anderson (2000) is conservatively equivalent to about 500,000 workers. In Vietnam, where garments are 14% of exports by value, the industry employs more than 24% of a manufacturing labor force of 4.6 million workers; in Cambodia, garments account for 80% both of exports and of the manufacturing labor force (UNIDO, 2004).¹³ Loss of these sources of export revenue, and the lower wages or reduced wage growth that this will cause, will tend to reduce labor costs economy-wide. Labor-intensive natural resource sectors will thereby experience cost declines that contribute to increased profitability over and above the direct price effects from growth of foreign demand.¹⁴ Another indirect driver will be FDI flows; while the evidence is ambiguous, one likely trend is for reduced FDI in SE Asian industries where competition with China is intense, possibly offset somewhat in the more advanced economies by increased FDI in medium-tech and high-tech sectors (Krumm & Kharas, 2003; Ng & Yeats, 2003).

In summary, China's growth and globalization are likely to cause SE Asian countries to experience negative terms-of-trade shocks for labor-intensive manufactures, and positive shocks for primary products. The countries most clearly affected are those that currently have both relatively large labor-intensive sectors and also relatively high comparative advantage in resource sectors—that is, Indonesia, Vietnam, Laos, Cambodia, and Myanmar. Adjustment to China's growth, if it occurs, will increase these countries' output of products that are intensive in the use of *both* natural resources *and* low-skilled labor. In the short to medium run, this shift could stimulate aggregate economic growth, but longer-run growth and welfare effects will be contingent on more unknowns, including the continued growth of China, other global market, investment and policy trends, and the domestic policy and institutional environment of each SE Asian country.

4. NATURAL RESOURCE EXPLOITATION: INSTITUTIONAL DIMENSIONS

We have argued that China's expansion constitutes an exogenous change in the comparative advantage of the poorer, more resource-

intensive SE Asian economies and as such stimulates a compositional shift in output and employment. Insofar as this induces declines in non-resource tradable sectors and increases exposure to global market volatility, it may reduce future growth prospects through familiar Dutch Disease mechanisms (see Section 2). But in contrast, natural resource sectors will enjoy rising profits driven by higher world market prices, and possibly also by lower domestic labor costs. Therefore, the rise of China alone is clearly not a sufficient condition for welfare loss. Rather, this will occur only if the shift in comparative advantage occurs in the presence of market failures or other distortions that make suboptimally high rates of resource depletion possible. Then, long-run growth could be reduced though depletion of resource stocks at the same time as the economy experiences slower growth of manufacturing output and jobs, and associated with the latter, reduced human capital investments and loss of inter-industry productivity spillovers. These possibilities have been explored theoretically in a variety of models (Brander & Taylor, 1997; Chichilnisky, 1994; Sachs & Warner, 1995) and at least one recent empirical study of a cross-section of developing countries confirms a negative relationship between measures of institutional quality and deforestation rates (Ferreira, 2004).

Table 5. *Measures of institutional quality from international comparisons*

	1. GDP per capita		2. Corruption perception index		3. Global competitiveness index: quality of public institutions	
	Value (US\$)	% Below ($N = 173$)	Score	% Below ($N = 145$)	Score	% Below ($N = 117$)
Malaysia	4,290	68%	5.1	75%	7.65	75%
Thailand	2,356	57%	3.8	63%	6.67	65%
Philippines	1,085	39%	2.5	26%	4.71	11%
Indonesia	906	34%	2.2	13%	5.12	24%
Vietnam	502	24%	2.6	32%	4.98	17%
Lao PDR	378	17%	3.3	51%	n.a.	n.a.
Cambodia	339	15%	2.3	18%	4.16	3%
Myanmar	n.a.	n.a.	1.8	2%	n.a.	n.a.

Percent below measures the percentage of countries in the survey having scores less than the one shown. Sources and notes, by line number:

1. World Bank, World Development Indicators Online (accessed May 2006), 2004 data expressed in constant US\$ of 2000, 173 countries, mean = \$6134.
2. Transparency International, http://www.transparency.org/policy_research/surveys_indices/cpi (accessed May 2006), 2005 data.
3. World Economic Forum: www.weforum.org/gcr, accessed May 2006, 2005 data. The quality of public institutions index is compiled from survey data containing responses to eight questions covering judicial independence, government neutrality in award of contracts, corruption in selection and award of government contracts, role of organized crime in business, and waste in public spending. Data have been rescaled to range from 1 to 10 (10 is the highest quality). Mean score for 117 countries is 6.29.

The poorer countries of SE Asia have low scores and international rankings on a wide variety of international comparisons of corruption, institutional quality, rule of law, and related phenomena. In general, their rankings on these measures are lower than their rankings on per capita income, a broad measure of development (Table 5). Indonesia, for instance, has a corruption perception ranking of 137 out of 159 countries in Transparency International's most recent data (with a score of 2.2/10, it is in the 13th quantile, meaning that only 13% of countries rank lower). It shares this rank with six other countries, the average of whose per capita incomes is barely half its own.¹⁵ The Philippines, in the 39th quantile of per capita income, is in only the 26% quantile of corruption rankings. Only Laos has a corruption ranking appreciably higher than its income rank. Country scores on the World Economic Forum's index of quality of public institutions (itself an aggregate over several sub-indexes) are still lower, as the table shows. Other than Malaysia and Thailand, every SE Asian country for which data exist has a much lower rank on this index than its rank by income.

While these data are at best only indirect measures of willingness and capacity to protect natural resources, direct evidence of market and institutional failures leading to overexploitation in specific countries and sectors is abundant. Indonesian timber removal rates, at about 80 million cubic meters per year, exceed even Jakarta's own "sustainability criterion" by a factor of more than three (Barr, 2002). Forest removal rates are even less easily measured in less open economies, though data from Sun *et al.* (2004) on growth of Chinese timber imports recorded at points near the Burmese border are strongly indicative. There is little doubt that the combination of opportunities created by trade and the lack of legal or institutional restraints are key to overharvesting.¹⁶

Forest destruction is driven both by the demand for timber and by the demand for land for plantation agriculture. The area planted to palm oil in SE Asia increased by 7.6% annually from 1990 to 2005 to reach 7.6 m ha; area planted in Indonesia, which is about half the regional total, increased at an annual rate of 11.8%. Coffee area grew by 5.6% to a total of 2.4 m ha, with Vietnam's area expanding by 17% annually.¹⁷ This land conversion occurs in spite of massive externalities, including biodiversity and habitat loss and loss of watershed

function. It is most visible in the form of the air pollution or "haze" which has blanketed the region to a greater or lesser degree for part of every year since 1997 as huge areas of forest are cleared by burning, largely for conversion to oil palm plantations (Schweltheim & Glover, 1999). Such costs are additional manifestations of institutional and policy failure.

The conversion of estuaries, lagoons, and coastal mangrove forests for intensive shrimp farming—an industry driven almost entirely by exports—in Thailand, Indonesia, Vietnam, and elsewhere is similarly aided by "de facto open access" (Barbier & Cox, 2004; see also Dutton, 2005; Fox, Adhuri, & Resosudarmo, 2005). In Vietnam, where seafood exports account for 15% of the value of non-oil exports and shrimp area alone has more than doubled since 1995 to more than 530,000 ha, the colonization of SE Asia's largest lagoon, Tam Giang Lagoon, has been facilitated both by a lack of appropriate laws and by the non-application of existing laws (Lai, 2005). Shrimp production in Vietnam increased by 13% per year from 1990 to 2003 and now accounts for about one-fourth of regional production.¹⁸

The deforestation and shrimp farming cases are especially noteworthy, but the list of industries and countries in which the absence, selective application, or non-application of appropriate laws has led to recognizably excessive drawdown rates of natural resources and associated environmental externalities in SE Asia is much longer (ADB, 1997, 2001; Colfer & Pierce, 2002; Francisco & delos Angeles, 2003; Francisco & Glover, 1999).

The direction of shifts caused by China's expansion and increasing global integration in the structure of comparative advantage of SE Asia's poorer economies involves contraction (or at least reduced growth) of labor-intensive manufacturing, and expansion of natural resource industries. Loss of comparative advantage relative to a very large competitor like China increases the distance between the first and second rungs of the industrialization ladder, delaying the onset of production-related productivity gains in manufacturing. The swing to natural resource exports cannot be sustained in the long run if depletion rates are excessive, and may also reduce current (and thus future) industrial growth prospects through Dutch Disease mechanisms.

As pointed out above, however, exogenous changes in comparative advantage can only re-

duce economic *welfare* if they encounter distortions that inhibit an optimal policy response. In most poor countries, such a distortion exists in the form of incomplete controls over-exploitation of natural resource stocks. With resource management powers poorly defined and imperfectly or corruptly exercised, the economies of the region are coming to resemble even more closely the hypothetical economy in Brander and Taylor (1997), in which comparative advantage in an open-access natural resource reduces welfare when moving from autarky to trade. In the absence of effective controls on resource depletion, and with no guarantee of future control over resource rents, such an economy experiences a race by all actors to liquidate natural resource wealth in the short term; in the longer term, therefore, it grows more slowly or not at all. China's expansion could conceivably fuel such a sequence of events in SE Asia. If it does, the real problem will lie not in China's voracious import demand, but in the failings of SE Asian domestic institutions and policies.¹⁹

5. CONCLUSIONS

The historically rapid growth of the larger resource-abundant SE Asian economies stands in stark contrast to the general prediction of the resource curse hypothesis. But will continuing globalization, both of their own economies and those of China and soon India, render the region's most resource-abundant economies once again vulnerable? In particular, will China's expansion deliver slower long-term growth to neighboring economies characterized by a combination of low-skill manufacturing and natural resource wealth?

The trade and investment effects of China's expansion are predicted to have slightly negative overall effects on the region, thereby moderating the generally positive predicted effects of global trade liberalization and growth. Countries like Vietnam and Indonesia, whose industry sectors are less diversified, will suffer relatively more than those such as Malaysia, especially given the latter's strength in high-tech sectors. The all-important apparel, footwear, and related industries are especially vulnerable, and their decline may have economy-wide consequences through labor market adjustments. Growth in demand for natural resource products, accompanied by declining

or stagnant real wages, will stimulate output in extractive industries such as forestry, fisheries, and mining; in rubber, oil palm, and other industrial crops; in specialized horticultural crops (tropical fruit, coffee) and in fisheries. The growth of these sectors' output will reflect shifts in SE Asia's comparative advantage associated with the China effect.²⁰

The long-term welfare consequences of this possible reorientation of SE Asian economies will be slight if there are legal and economic institutions to account for the true opportunity costs of the new mix of activities. However, if additional demand for timber, fisheries, and agricultural land is unrestrained by legal safeguards or externality-correcting instruments, higher global demand and lower labor costs may spark an acceleration in resource-depleting activities, including conversion of forests to industrial agriculture. In some areas of the region, these changes—being difficult if not impossible to reverse—could spell long-term reductions in earning power and increased vulnerability to environmental disasters.

Some caveats are of course required. China's continued rapid will eventually begin to drive up wages, which will reduce the global competitiveness of its most labor-intensive industries. A substantive revaluation of the yuan could have an analogous effect, with the most import-intensive Chinese industries and those serving mainly the domestic market gaining relative to others—both trends that will undercut labor-intensive, high value-added industries such as garments and furniture. In SE Asia, meanwhile, niche-market producers of specialized product lines will undoubtedly survive and thrive, even in an era of general decline of the industries to which they belong. Finally, economies with greater complementarity or diminishing overlap, such as Malaysia and Thailand, will stand to gain from freer trade with a rapidly growing Chinese economy, and the growth of specialized sectors such as computer components and other high-end electronics should offset some of the more harmful effects described in this paper. Each of these possibilities merits careful attention and more detailed research.

Turning to policy implications, it remains to be seen whether the possible changes identified in this paper could truly merit the term "curse." First, changes in comparative advantage are taking place against a backdrop of clear economic gains from globalization; the

China effect is predicted only to reduce these gains somewhat, not to negate them altogether. Second, we have argued that the possibility of a “resource curse” outcome in SE Asia depends on the coexistence of shifts in comparative advantage with market or institutional failures that undermine the ability to manage natural resources for the long run. In countries where such institutions are strong, the likelihood of resource over-exploitation is lower. On this score, the data in Table 5 suggest that Malaysia and perhaps Thailand are countries making good progress toward robust governance institutions. By contrast, Cambodia, Laos, Myanmar, the uplands and coastal frontier areas of Vietnam, and the outer islands of Indonesia—all areas in Asia where the restraining hand of central government is weakest—appear to be the most vulnerable. How global market trends affect long-term

natural resource management in these areas will be a critical factor determining the future of their forests, soils, and other natural resource stocks and, ultimately, the welfare of their human populations.

An important insight for countries most vulnerable to the trends we have identified is that better institutions and policies for resource management may be facilitated by economic growth, but are not automatically created by growth. Sacrifices in potential income may be merited in the present in order to secure higher growth in the future. Explicit recognition of the potential costs of resource overexploitation, and of the general equilibrium effects of exogenous changes in global markets in general are the starting points for discussion of policies and institutional innovations that could resolve the “curse” of natural resources at its source.

NOTES

1. SE Asia is Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor Leste, and Vietnam. Our focus on resource abundance excludes Singapore, and lack of data precludes consideration of Timor and Brunei.

2. Other than in news reports, for example, “China boom puts rainforest under threat,” *Financial Times*, 2/19/05; “Forests in Southeast Asia Fall to Prosperity’s Ax,” *New York Times* 4/29/06.

3. Hausmann and Rigobon (2002) point out that global market volatility then translates into greater domestic volatility since specialization in resource sectors is accompanied by an increase in the relative size of non-traded sectors (through Dutch disease effects). The burden of adjustment to external shocks, rather than being distributed between a combination of intersectoral resource movements and expenditure effects, then falls more heavily on expenditure effects alone, creating real exchange rate instability.

4. In the Sachs–Warner data, the resource dependency variable, the share of resource exports to GDP, is found to be endogenous by a standard Hausmann test (Li & Coxhead, 2006).

5. It is also of interest to note that the empirical growth literature contains very few instances of regression models *not* focused specifically on the resource curse hypothesis in

which resource abundance emerges as a significant factor affecting long-run growth (Li & Coxhead, 2006).

6. This may be analogous to the biological concept of convergent evolution, in which, for example, birds and bees both have wings not because they have a common ancestor, but because they have adapted to their environment in similar ways. More formally, observation of a negative relationship between resource wealth and growth does not imply that all data are generated by a common underlying process. A test of this would involve searching for significant differences and dividing the data accordingly, as has been done for the empirical growth literature (Brock & Durlauf, 2001; Durlauf & Johnson, 1995).

7. Defined to include ASEAN.

8. To see this, it is necessary only to compare China’s market share in the US and EU markets with that in the non-quota constrained Japanese market (James, Ray, & Minor, 2003).

9. Quotas were quickly reimposed on a few product lines, but overall discrimination against China in garment trade has diminished nonetheless.

10. Some of the increasing similarity in manufacturing structure is reflected not in competition in third markets but in intra-regional inter-industry trade (Athukorala,

2003), though these potential gains are countered by apparent diversion of FDI from ASEAN to China.

11. Of course, the accuracy of the *RCA* as a measure of comparative advantage is impaired by distortions such as trade policies. Due to data restrictions, our calculations ignore this.

12. World Development Indicators Online: www.worldbank.org, accessed February 2006.

13. No comparable data are available for Myanmar. However, changes in Thai garment industry output are likely to provide good indicators of implications for the Burmese industrial labor force. According to the Thai Ministry of Labor the country has 1.3 m illegal migrant workers, 72% of whom (i.e., about 0.94 m) are from Myanmar (Kulkolkarn, 2006). The increasing spatial concentration of Thai garment factories along the Burmese border is evidence that many, if not most of the workers in these factories are now non-Thai. Thus, a large fraction of employment of Burmese workers in labor-intensive tradable manufacturing currently takes place in Thailand.

14. The extent to which labor is mobile from urban manufacturing-sector jobs to agriculture is of course an empirical question. Labor market adjustments during the recent Asian economic crises provide helpful pointers: in Indonesia, an official labor market data survey in August 1998 found that among workers leaving jobs in manufacturing and construction the previous year, 39% shifted to agriculture (Manning, 2000), contributing to a net gain of 4.7 million farm jobs, a 13.3% year-on-year increase (Hugo, 2000).

15. These are Azerbaijan, Cameroon, Ethiopia, Iraq, Liberia, and Uzbekistan.

16. In the past decade, there has been a shift toward decentralized resource management throughout the region. How this will affect institutional strength and regulatory control in the long run remains to be seen; individual cases present both positive and negative signs (Colfer & Pierce, 2002; Dutton, 2005; Rola & Coxhead, 2005).

17. FAOSTAT (<http://faostat.fao.org/>, accessed May 2006). For data series and charts, see <http://www.aae.wisc.edu/coxhead/papers/nrc/appendix.ppt.htm>.

18. FAOSTAT (<http://faostat.fao.org/>, accessed May 2006). For data series and charts, see <http://www.aae.wisc.edu/coxhead/papers/nrc/appendix.ppt.htm>.

19. A very large fraction of timber imported by China—about 70% in equivalent volume—is re-exported in manufactured form, largely to the United States and European Union (White *et al.*, 2006). China's import demand is thus an indirect expression of world demand.

20. Interestingly, such a trend would take SE Asia “back to the future.” A history of SE Asian trade during the maritime trade boom of the fifteenth century says:

“Southeast Asia, taken as a whole, has always been an exporter of raw materials and an importer of manufactures. Its own manufactures were significant items of local trade, but . . . they were not needed in China or India, the two populous manufacturing centers on its borders. It was the products of tropical agriculture and horticulture . . . that received the greatest stimulus from the trade boom . . . followed by forest products.” (Reid, 1993, p. 32).

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