

The Growth of China and India: Implications and Policy Reform Options for Malaysia

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31 December, 2008

Abstract

This study explores the trade-related impacts of rapid growth of China and India on the Malaysian economy and evaluates policy options to better position Malaysia to take advantage of these changes. Higher growth in China and India is likely to raise Malaysia's national income and to expand Malaysia's natural resource and agricultural exports while putting downward pressure on exports from some manufacturing and service sectors. Increases in the quality and variety of exports from China and India are likely to substantially increase the overall gains to Malaysia. The expansion of the natural resource sectors and the contraction of manufacturing and services reflect a Dutch-disease effect which will raise the importance of policies to facilitate adaptation to the changing world economy and improve competitiveness. Preferential liberalization with India and completely free trade with China would provide greater market access gains than MFN liberalization, but neither would be as effective in increasing income as MFN liberalization, and FTAs would lead to greater competitive pressure on many of Malaysia's industries than MFN reform. Increased investments in education and infrastructure could boost manufacturing and services sectors in Malaysia, while improving trade logistics would benefit sectors with high transport costs, including the agricultural and resource-based industries.

JEL codes: F11, F13, F43, F47, O20

Key words: export growth, China, India, Malaysia, policy response, competitiveness

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Introduction

The rapid economic growth of China and India is having a major influence on the world economy. Winters and Yusuf (2007) find that China's growth spurt alone stands out as the greatest ever seen in terms of expanding the share of the world output and trade. Widely-cited papers by Wilson and Purushothaman (2003) and others have pointed to the potentially rapid changes in the relative importance of countries associated with the growth of today's major developing economies, including, Brazil, Russia, India and China. Trade linkages, both direct and indirect, are transforming patterns of world trade and having important impacts on the economies of virtually all countries. Projected future growth in the labor-abundant Giants—China and India—appears likely to have particularly large impacts on demand for the exports of electronics and natural resources that are so important for the Malaysian economy.

A key feature of the economic growth of China and India has been even more rapid growth in their trade—arguably the strongest and most direct channel through which the growth of China and India is affecting other developing countries. China accounted¹ for 7.1 percent of world exports of goods and services in 2006—substantially more than her share of the world GDP at market prices (estimated at 5.5 percent in 2006). With annual growth of 17 percent per year over the period from 1995 to 2005, China and India accounted for over 12 percent of world export growth, much more than the 7.2 percent contributed by the United States. India remains much smaller and less open than China, at 1.3 percent of exports and 1.9 percent of global GDP at market prices in 2006, but has the potential to become much larger.

The purpose of this paper is to analyze the trade implications of the growth of China and India for Malaysia and to evaluate policy options to position Malaysia so that it improves its

¹ Source: World Bank, Development Data Platform (DDP), October 2008.

competitiveness and takes advantage of the rapid changes in the region and the global economy. We begin by considering the nature of the key trade linkages between Malaysia and China and India, and review the available literature on the nature and magnitude of these effects. Then, we describe the anticipated state of the world economy in 2020, showing the nature of the changes in a world heavily influenced by the higher growth rates of large developing countries. Finally, we present simulation results showing the implications of higher growth in China and India for Malaysia, and the results showing the effect of various trade and competitiveness policy options. We conclude with a summary, some caveats and suggestions for potential future work.

Channels of impact

If we hold policy settings constant in both the emerging economies and the rest of the world, the trade impacts of growth in China and India on Malaysia can usefully be divided into four channels:

- Opportunities for Malaysia to export to China and India;
- Opportunities for Malaysia to import from China and India;
- Competition for Malaysia from China and India in third markets;
- Impacts of changes in China's and India's trade with other partners.

The first two of these interactions unambiguously involve gains to Malaysia, although the first is typically seen politically, as well as economically, as a gain, while the second is frequently seen politically as a loss. The third interaction invariably involves an economic loss, and is frequently the subject of a great deal of attention and angst. The fourth of these interactions is fundamentally ambiguous in sign, depending upon the welfare impacts of changes in Malaysia's terms-of-trade. If increased imports by China and India raise the prices of goods that are also imported by Malaysia, then the effect can be adverse. If, for example, China and India increase their demands for a particular natural resource, Malaysia may lose as the price of this resource increases.

How large the third-market competition effect is in the case of Malaysia depends a great deal on the extent to which China and India's patterns of exports overlap with each other and with Malaysia. As shown in Dimaranan, Ianchovichina and Martin (2007), the export patterns of

China and India have been quite different, with India relying much more heavily than China on exports of services. Even within merchandise trade, their export patterns have been radically different at the six-digit level of the Harmonized System, with only one product—refined petroleum—appearing on the two countries’ top-25 list of products, which accounted for 58.4 percent of India’s merchandise exports and 38.4 percent of China’s.²

The export patterns of Malaysia and China are quite similar (Table 1) while those of Malaysia and India are very different (Table 2). In 2006 there were 10 products common to China’s and Malaysia’s top-25 list of exports, while only three products—refined-petroleum, jewelry and commodities unspecified according to kind—appeared on the top-25 list of products for India and Malaysia. The ten categories of products common to China and Malaysia’s top 25 list of exports included portable digital data processors and parts, radio and TV equipment, parts, and receivers, semiconductors, electronic circuits, storage units, input-output units and refined petroleum. Many of these goods are components that could be complementary with export growth in China and India. Although the share of Malaysia’s exports destined for China doubled between 2000 and 2006, only 7.3 percent of Malaysia’s exports were shipped from Malaysia to China in 2006, and the vast majority of Malaysia’s top manufactured exports were exported to third markets (Table 3).

Given the significant overlap between the export patterns of Malaysia and China, competition between the two in third markets may be substantial and increasing. Indeed there has already been a significant shift in the composition of exports by type in the period from 2000 to 2006. While Malaysia’s exports of capital goods declined as share of total exports from 57 percent to 51 percent during this period, China’s exports of capital goods increased by more than 50 percent as a share of total exports during the same period (Table 4). Malaysia’s exports to

² A notable feature of China’s list is the prominence of computer and electronic equipment products under Chapters 84 and 85. These two chapters, which also include non-electronic equipment, alone accounted for almost 42 percent of China’s exports in 2004, up from 16 percent in 1994. In India, three HS products under Chapter 71 (diamonds and jewelry) and refined petroleum under Chapter 27 likewise accounted for 28 percent of total exports. This difference in export patterns reduces the risk of a collision in which the exports of China, India and other developing countries are all simultaneously depressed.

China still represent a small share of its overall exports although in recent years Malaysia has increased exports of all categories of goods to China.

Complicating the analysis is the fact that, while both China and India are more labor-abundant than developed economies, relative factor endowments and income levels vary substantially across regions within these economies. Many of China's coastal areas are in a different category than the much more labor-abundant inland provinces. This heterogeneity can influence the range of goods China produces and exports, and therefore helps explain the disproportionate similarity of China's export bundle with that of the developed countries (Schott, 2007). India's large number of skilled workers also implies that there may be a lot more competition between India and middle-income and developed economies than suggested by its relative endowment shares.

On the export side, China and India also differ substantially in the importance of final goods in their exports (Dimaranan, Ianchovichina and Martin 2007). Broadly, China has relied primarily on exports of final manufactured products, frequently as part of an East Asian production sharing network. In 2004, 61 percent of China's non-fuel exports were classified as final goods, compared to 40 percent of India's. Within manufactures, China has relied heavily on exports of finished goods, while India has focused much more on exports of intermediate inputs. India's exports are frequently of capital- and skill-intensive goods, while China has emphasized exports of labor-intensive goods—although these are increasingly sophisticated (Rodrik 2006).

India's share of commercial services in total goods and services exports has been much higher than China's, not just since the rapid expansion of exports of computing services around 2000, but for the entire period since 1992 during which comparable estimates are available. The share of services in India's exports, at around 20 percent, began over twice as high as China's. This share declined in India until the late 1990s, when it again began to rise sharply. Since 2000, services have accounted for over a quarter of India's exports, while the share of services in China's exports has declined to under 10 percent of total exports—although China's exports of services have been growing rapidly in absolute terms. However, both countries still have relatively small world shares – 1.8 percent and 2.8 percent of world services exports, respectively, and services trade alone is unlikely to drive India's economic performance (Winters and Yusuf, 2007).

Finally, China's export growth has been accompanied by tremendous growth in product variety. While China was present in 9 percent of all manufacturing product categories in 1972, it was present in 70 percent of categories by 2001 (Schott 2007). This growth at the extensive margin is an important factor, which we take into account when evaluating the implications of rapid growth in China and India on the rest of the world.

An important concern for Malaysia and other countries is the extent to which the Giants, especially China, will move up market into their "product space." India and China have demonstrated their ability to upgrade their performance in specific sectors. This issue is explored by Dimaranan, Ianchovichina and Martin (2007) by examining the potential implications of different types of growth in China and India. They find that adjustment pressures in particular sectors are likely to be much greater if growth is driven by technical change that is biased towards particular rapidly growing sectors than if it is driven by broad-based and relatively neutral technical change.

The rapid growth of imports by China and India is likely to change the prices of many goods of interest to Malaysia, even if these goods are not traded directly. The signs of these effects are ambiguous, because they depend on the relationships between the mix of these products and those exported by Malaysia. Particular areas where price changes seem likely are in agricultural commodities, natural resources, and energy products (see Dimaranan, Ianchovichina and Martin, 2007). The relationship between the growth of output in emerging countries and the prices of these goods is likely to be different from that of manufactures and services.

For manufactures and services, we would expect a decline in price relative to factor prices (in actual, rather than effective, prices). Productivity growth, or more efficient use of factors, in the emerging economies is raising their output and hence putting downward pressure on the prices of manufactures and services. Increases in China's and India's demands for some manufactures not produced there—such as, for example, airplanes—may, however, increase the prices of these manufactures when imported by China, India, and Malaysia.

Energy and mineral products are different from manufactures in that the supply of some of these resources is constrained by rising costs of locating and extracting resources. As incomes rise, the demand for energy grows strongly, and this tends to push up the price of energy

products relative to factor prices. In our simulation, this effect is muted, but not completely offset, by the increase in the productivity of energy production itself assumed in the analysis.

For agricultural goods, there are several competing influences on prices. The first is the technological change effect described above for manufactures and services, which tends to lower prices. A second is the presence of a fixed factor, land, in agricultural production, which tends to raise prices because world income demand for these goods has risen, just as in the case of energy products. A third factor is the well-known Engel effect—that demand for agricultural products, and particularly basic foods, tends to rise more slowly than income. A fourth factor that can be important in influencing agricultural prices is the Rybczynski effect—if growth is associated with increases in the capital-labor ratio, it will tend to reduce agricultural output and raise agricultural prices (see Martin, Ianchovichina and Dimaranan 2008).

Dimaranan, Ianchovichina and Martin (2007) find that higher growth in the Giants implies increases in output of agricultural and forestry products in other countries and in output of energy, mineral and other resource-based products in countries endowed with natural resources. As the Giants achieve major gains in their market shares in manufacturing, most other countries experience declines in manufacturing output relative to base, especially in clothing and electronics, which are sensitive to increased competition from the labor-intensive Giants. Therefore, even if the Giants' success is generally good news for other economies, there are adjustment costs that will be borne by different stakeholders within those countries.

Methodology and Simulation Design

To analyze the consequences of higher growth in China and India on Malaysia, we use a modified version of the standard GTAP model (Hertel 1997). This model emphasizes the constraints imposed on economies by their overall resource endowments, and takes into account the role of intersectoral factor mobility and overall resource constraints in determining sectoral output supply. Product differentiation between imported and domestic goods and among imports from different regions allow for two-way trade in each product category, depending on the ease of substitution between products from different regions. Factor inputs of land, capital, skilled and unskilled labor, and in some sectors a natural resource factor, are included in the analysis. The

model includes the explicit treatment of international trade and transport margins, a “global” bank designed to mediate between world savings and investment, and a relatively sophisticated consumer demand system designed to capture differential price and income responsiveness across countries.

The constant returns to scale version of the GTAP model was adjusted to incorporate China’s duty exemptions—which have been a key reason for the rapid integration of China into global production networks—and to allow for much deeper integration by India into global production sharing than has been the case in the past. This was done assuming large-scale liberalization of the non-agricultural sector in India and the introduction of an effective system of duty exemptions for inputs used in the production of exports in India.

Duty exemptions were incorporated in the GTAP model and data base following the methodology developed by Ianchovichina (2004). This duty exemption model allows for two separate activities in each industry. Production of exports is represented as an activity for which imported intermediate inputs are available duty-free. Production for the domestic market uses the same technology, but requires payment of duties on intermediate inputs. Firms engaging in production for either the domestic market or the export market purchase both imported and domestic intermediate inputs which are imperfect substitutes following the Armington structure. Ianchovichina (2004) documents the approach used to introduce duty exemptions into the GTAP model and shows that failing to account for duty exemptions introduces bias in trade liberalization outcomes in countries with such a system.

The 57 sectors of the GTAP 7p5 Data Base were aggregated into 26 sectors based on their importance to China, India and Malaysia. Because the 106 regions in this database would provide too much unnecessary detail besides slowing down our calculations, we aggregated most regions into 11 regional aggregate groups and 14 separate countries of interest—including Malaysia, China, India and a number of countries in the Asian region.

To examine the implications of more rapid growth in China and India on Malaysia, we needed first to take account of some of the major reforms that are transforming India’s trade structure, in particular liberalization of non-agricultural tariffs, the introduction of free-trade zones that remove the burden of tariffs on intermediate inputs used in the production of exports,

and improvements in infrastructure needed to support trade. Then, we undertake a baseline projection to 2020, to provide a benchmark against which the effects of higher growth rates of output might be assessed (See Table 5). This baseline allows us to take account of the much higher expected rates of growth in many developing countries, including China and India, than in the mature industrial economies, and a consequent greater impact of future changes in outcomes in developing countries.

We examine the implications of higher-than-projected growth in India and China in order to assess the direct implications of growth in China and India on Malaysia. To analyze the pure effects of higher growth in China and India, we assumed that growth rates in each region were 2 percentage points per year higher than under the baseline. Using an approach similar to Dimaranan, Ianchovichina and Martin (2007), we considered accelerated growth over a fifteen year baseline which resulted in output levels 34.6 percent higher in each region than under the baseline scenario. Consistent with Kaldor's (1957) stylized facts of economic growth, we increased also the stock of human and physical capital in line with the overall output increase in these two growing economies.

Recent empirical evidence (see, in particular Hummels and Klenow, 2005) suggests that economic growth of the type considered increases both the quality and the variety of the goods exported by the growing economy. Using the price aggregator dual to Hummels and Klenow's quantity aggregator, we are able to specify the reduction in the effective prices associated with their combinations of increases in variety and quality. This price aggregator is

$$P^*=[N(P/\lambda)^{(1-\sigma)}]^{1/(1-\sigma)}$$

where P is the actual price of an exported good, N is the number of varieties of this good, λ is the quality index, and P^* is the effective price of the exported good. Where purchasers have utility or demand functions that value gains in variety, the effective prices of goods decline as the variety of goods supplied increases. We evaluate these effects assuming an elasticity of substitution between different varieties, σ , equal to 7.5—the mid-range value considered in Hummels and Klenow (2005).

In addition, we evaluate the effects of: (i) moving from 2004 trade barriers to full liberalization between Malaysia and China,³ (ii) strengthening trade ties with India through a bilateral Free Trade Agreement (FTA); (iii) improving the efficiency of its economy through an MFN liberalization; (iv) increasing the rate of growth of its skilled labor by 2 percentage points; (v) increasing the rate of physical capital accumulation by 2 percentage points; and (vi) improving the efficiency of transport services so that transport costs are reduced to a level comparable with Singapore, the regional leader.

The macroeconomic closure of the simulation model assumes a constant level of employment, perfect mobility of skilled and unskilled labor between sectors but none between regions. Because we look at long-run trends, we have doubled the elasticity of substitution between imported goods from different sources and between composite imported and domestic goods from the values used in the GTAP database. In all simulations, the trade balances as shares of GDP were fixed for China and India to avoid potentially important changes in welfare resulting from changes in financial inflows from abroad when growth rates in these countries change substantially.

Results

Impact of global growth 2005-2020

We model the impact of global growth from 2005 to 2020 using widely-used projections for the growth in population, labor force, capital and GDP. We present these estimates for our set of regions in Table 5. The most rapidly growing regions are expected to be in East Asia—China, Malaysia, India, Vietnam and Indonesia—all growing above five percent per year.

Table 6 shows some key effects of global growth in the 2005 to 2020 baseline for the world. The first two sets of columns in the table show industries' base output shares and growth rates, the third column shows the contribution of each sector to global growth as a share of the total. Most of world growth in this period is attributed to growth in services other than trade,

³ This involves deepening of trade reform beyond the current FTA between Malaysia and China.

transportation and communication (33 percent), followed by growth in trade and transportation (16 percent), and communication services (13 percent). Half of world export growth can be attributed to four sectors including machinery (15 percent) and electronics (15 percent), vehicles (10 percent) and chemicals (11 percent).

Energy prices will likely experience the greatest increase relative to the composite price of factors (in actual, rather than effective, prices)⁴ rising by 27 percent as the supply of energy products is constrained by a fixed factor, energy resources, although energy output can be augmented by applying additional capital and labor (Table 6). As incomes rise, the demand for energy will likely grow strongly, and this will tend to push up the price of energy products relative to the factor price index that serves as the numeraire in our model. In our simulation, this effect is muted, but not completely offset, by the increase in the productivity of energy production itself assumed in the analysis.

For most manufactures and services, we would expect a decline in price relative to the composite price of factors (Table 6). World output is expected to increase for any given level of factor use, and the price of the augmented factors used in production of manufactures would rise relative to the price of commodities.

For agricultural products the results are likely to be mixed, with prices of some products in world markets—namely wheat, vegetables and fruits, plant-based fibers and other crops—rising slightly, while prices of other agricultural products decline to varying degrees (Table 6). These results combine the effects of the different factors influencing prices in the world economy. As discussed in the previous section, these factors include technical change, the presence of an important fixed factor (land), and Engel and Rybczynski effects.

Impacts of additional growth of China and India

While the results from the baseline scenario are interesting, they do not allow us to tell how much of the changes observed in the world economy are due to the extraordinary performance of the Chinese and Indian economies in that baseline. To gain some insight into the effects of

⁴ This is the numeraire in the model.

higher growth, we consider the impact of adding 2 percentage points per year to growth rates in China and India. As simulated in our next scenario, this additional growth is expected to provide substantial benefits to China and India and relatively small, and mostly positive, impacts on other countries/regions.

The higher growth performance might be thought of as higher-than-projected performance beyond the baseline outcome. Alternatively, given the near-linearity of the model for this type of simulation, it will—with a change of sign—give an indication of how much the outcomes in the baseline might have fallen short of the observed levels had growth rates in China and India been 2 percent per year below their baseline levels. The impact of additional growth supplemented with an improvement in the quality and variety of exports is also examined under the assumption that the substitution parameter σ between different product varieties takes the Hummels-Klenow mid-range value of 7.5.

Welfare impacts

Table 7 summarizes these results for two key economic variables: welfare and the terms of trade under two different scenarios—“growth” corresponding to 2 percent extra growth in China and India, and “growth and quality” corresponding to 2 percent extra growth accompanied by improvement in the variety and quality of exports from China and India. The first two columns of the table show that most countries, including Malaysia, will likely benefit from additional growth in these Giants, and all countries and regions considered gain if growth is accompanied with improved quality and variety of the Giants’ exports. The welfare changes are expected to be largest for China and India, which will benefit directly from their own higher productivity. The gains for other countries are expected to be relatively small in the absence of quality and variety improvements on exports from China and India. High-income countries will likely gain, except for the EU and Japan, which might lose in the growth-only scenario—despite terms-of-trade gains—because the interactions of existing distortions and price changes translate into second-best efficiency losses. The expected income losses are relatively small but can provide potentially important insights into the nature of these second-best effects (Martin, Ianchovichina and Dimaranan 2008).

The explanation for the terms-of-trade changes can be inferred from Table 8 that lists the impact of our scenarios on each country/region's exports and imports. Many countries benefit from improved terms of trade for their products as China increases its imports from the rest of the world by 28 percent and India by 34 percent in the growth scenario and this expanded demand significantly raises world prices of a number of agricultural and energy commodities. Some middle- and low-income countries such as Thailand, the Philippines, as well as other countries in South Asia, are projected to lose as competition with China and India in third markets affects negatively their terms of trade.

The welfare gains to Malaysia from growth in China and India are estimated to be US\$ 2.6 billion which is equivalent to a rise in real per capita income of 1.2 percent relative to baseline. These gains are not associated with increases in export volumes, but rather terms of trade gains of around US\$ 1.9 billion (Table 7). Further analysis shows that a significant portion of these estimated gains, about US\$ 0.5 billion, comes from the rising world price of energy products—one of Malaysia's major exports. An additional US\$ 0.6 billion in terms-of-trade gains are estimated to come from a smaller decline in Malaysia's export prices of electronics, machinery and equipment compared to the decline in world prices of these products (Table 11).⁵ Given these terms-of-trade gains Malaysia is expected to be able to increase its consumption at any given volume of exports, increasing domestic consumption and reducing its ability to export.

Industry impacts

The estimated losses in terms of export volumes for Malaysia suggest that the effect from increased opportunities to export to China and India will be dominated by the effects from increases in third-market export competition from China and India (Table 10) and the rise in domestic demand resulting from the anticipated terms-of-trade improvement (Table 7).

Third-market competition is expected to be especially strong for manufactured goods (Table 10) and Malaysia is likely to play a smaller role in exporting manufactured goods with the exception of some resource-based manufactures (e.g. processed food, and paper and wood

⁵ This result implies that under an assumption of less differentiated products the gains to Malaysia may be substantially smaller than presented in this paper.

products, see Table 9). But the boost to China's and India's manufacturing industries will likely have positive spillover effects via increased demand for intermediate inputs including energy and agricultural products. Malaysia may increase its exports of agricultural products including exports of wheat and oils and fats to the rest of the world, rice and grains to Vietnam and Rest of South Asia, and plant-based fibers to East Asia, North and South America, Sub-Saharan Africa and the countries of the Former Soviet Union.

Within manufacturing, the hardest hit sectors are expected to be light manufactures,⁶ machinery and equipment, apparel, and electronics whose exports contract by 19 percent, 8 percent, 8 percent, and 7 percent, respectively (Table 9). Electronics, machinery and other manufactures are the sectors that see the largest estimated declines in prices as they are expected to face intensive international competition (Table 11).

Impacts of improved quality and variety with higher growth of China and India

Under the central assumption of an elasticity of substitution of 7.5, adding improvements in the variety and quality of exports from China and India to the high growth scenario is found to increase the estimated welfare gains to Malaysia from US\$ 2.6 billion to US\$ 6.2 billion (Table 7). Most countries, including Malaysia, are expected to benefit because they can import higher volumes from China and India at lower effective prices and also experience greater demand for their exports from China and India. As a result, Malaysia's terms-of-trade gains amount to an estimated US\$ 4.1 billion, compared to just US\$ 1.9 billion in the case of additional growth without improvements in the quality of exports.

The biggest beneficiaries are expected to be, of course, China and India, whose welfare increases by an estimated 31 and 32 percent, respectively (Table 7), while their exports to the rest of the world may expand respectively by 60 percent and 68 percent—a much stronger expansion than the one expected in the growth only scenario (Table 8). Malaysia and other countries may benefit from China and India's increased appetite for imports and limit the decline in their export volumes.

⁶ In Table 9 these are denoted as other manufactures.

Malaysia is expected to increase exports and output of agricultural and natural resource-based products including wheat, vegetables and fruits, oils and fats, plant fibers, and other crops, livestock and meat; energy products, leather goods, wood and paper, minerals, and chemicals (Table 9). However, without efforts to keep up with China and India, some countries including Malaysia may see their exports of manufactured products eroded due to third-market competition (Table 10). Improved quality exports from fast-growing China and India imply that competition in the markets for different manufactured goods will intensify and lead to further contraction of the sugar, apparel, car, machinery and equipment, electronics, other manufacturing and other services industries in Malaysia (Table 9) and other countries.

Policy responses to the rise of China and India

While growth of China and India is expected to increase Malaysia's average per capita incomes, the fact that it might hurt disproportionately its manufacturing sector calls for an investigation of the likely policy responses Malaysia might want to consider. In this paper we discuss the likely impacts on Malaysia of extending the FTA with China and five additional scenarios: (i) strengthening trade ties with India through a bilateral FTA; (ii) improving the efficiency of the economy through an MFN liberalization; (iii) increasing the rate of growth of its skilled labor by 2 percentage points; (iv) increasing the rate of physical capital accumulation by 2 percentage points; (v) improving the efficiency of transport services so that transport costs are reduced to levels comparable with Singapore.

The results for welfare, output, and exports are shown in Tables 12, 13 and 14. These results are indicative of the likely effects and adjustments that will happen as Malaysia undertakes different policy reforms to improve the competitiveness of its economy. The first three scenarios are relatively inexpensive to implement as they involve changes in policy rules, while the second three scenarios may need both policy change and expenditures on infrastructure. The welfare results however do not factor in the costs of putting in place the assumed additions to physical and human capital in Malaysia, nor those associated with improved efficiency of trade logistics.

The welfare results suggest that MFN liberalization would be more beneficial to Malaysia than bilateral liberalization with China or India or both. Malaysia's welfare gains from unilateral

liberalization are estimated at US\$ 6.5 billion in addition to the gains from higher growth in China and India (Table 12). These gains are sizable as they reflect the boost from tariff elimination on imports from all sources, in a situation where tariffs are above 8 percent on a wide range of imports such as crops, processed foods, textiles, apparel, leather, wood and paper products, minerals and motor vehicles (Table 15). Nearly all of these welfare gains stem from improved allocation of resources across sectors.

The expected benefits from FTAs with either China or India are more modest—US\$ 3 billion and US\$ 2 billion (Table 12), respectively, and come primarily from improved terms of trade rather than improved allocative efficiency. India would be expected to benefit more than Malaysia from the FTA with Malaysia, while China's expected gains from bilateral liberalization would be smaller than the expected gains for Malaysia.

Preferential agreements between Malaysia and China, and Malaysia and India provide greater opportunities for firms in Malaysia to take advantage of new opportunities in the two Giants. However, they would likely do little to improve the competitiveness of Malaysian firms in their home market. Some sectors in Malaysia, such as oils and fats, dairy, textiles, apparel, leather, and chemicals are estimated to have higher output as a consequence of FTAs, with the estimated gains from increased market access outweighing the effects of increased competitive pressure. In all other industries, we estimate that preferential liberalization reinforces the competitive effects of growth in China and India on firms in Malaysia. We find that an FTA with India would likely increase output in only a few sectors in Malaysia sectors—such as oils and fats, textiles and leather. In most other cases, an FTA with India is estimated to have negative net impacts on output.

MFN liberalization would likely have positive impacts on a much larger number of industries than FTAs with the Giants. Unilateral liberalization would help overcome downward pressures on industry output levels from higher growth in China and India in rice, wheat, fruits and vegetables, sugar, plant-based fibers, livestock, dairy, textiles, apparel, leather, chemicals, metals, motor vehicles, machinery and equipment, and other manufactures; and on exports from

all those sectors.^{7,8} In addition, unilateral liberalization would help expand exports of grains and crops.⁹

Raising the stock of human and physical capital could lead to the largest income gains under any of the scenarios considered—US\$ 8.9 billion and \$US 20.3 billion, respectively. These estimated gains, however, need to be adjusted for the costs of accumulating these factor inputs. Clearly, the accumulation of additional human capital involves careful attention to educational policies for promoting education and retaining skilled workers in Malaysia. A key point is that increases in human and physical capital are expected to provide a boost to those sectors using human and physical capital factors more intensively—namely manufacturing and services (Table 13 and Table 14). These are high-technology sectors that would otherwise be expected to contract due to competition from China and India, and therefore the policy of increasing investment in education and infrastructure is one that fits well with broader goals to position Malaysia for growth in capital and skill-intensive sectors.

Improving trade logistics also comes with distinct benefits. It is estimated that improving the efficiency of transport services so that transport costs become comparable to those in Singapore would generate gains of approximately US\$ 3.3 billion. Reduced trade costs will benefit industries with high transport costs including the agricultural sectors, and resource-based industries (Table 13 and Table 14).

Conclusions

The key issue for our analysis is the extent to and channels through which higher-than-expected rates of growth in China and India affect Malaysia. In our survey of the literature, we noted that there are four broad channels through which the growth of China and India might be expected to impact on Malaysia:

⁷ These results should be viewed as upper bound estimates because Malaysia may already have much more open trade regime than assumed if the effects of existing duty drawback/exemption arrangements were taken into account.

⁸ The dramatic expansion of exports of motor vehicles can be explained with the high tariffs on these products.

⁹ Note that the huge expansion of exports of wheat and other crops is from a very small base. Therefore, in value terms the effect is small.

- Opportunities for Malaysia to export to China and India
- Opportunities for Malaysia to import from China and India
- Competition for Malaysia from China and India in third-markets
- Impacts of changes in China's and India's trade with third markets.

We began with a representation of the world in 2005. We also took into account liberalization and reductions in trading costs that increased India's interaction with the world economy. We then projected it forward to 2020, to take into account the rapidly-increasing importance of China and India in the world economy. For our analysis, we used a special version of the Global Trade Analysis Project (GTAP) model designed to allow for extensive export-oriented manufacturing with exporters' access to duty-free intermediate inputs in China and India.

We then considered the impact of growth in China and India that exceeds the projected growth rate by 2 percentage points per year or 34.6 percent over our 15 year projection period. This growth was assumed to be associated with the same percentage increases in physical and human capital as a result of higher savings and investment in China and India. In addition to examining the consequences of extra export growth from China and India for Malaysia, we considered a scenario under which the quality and variety of exports from these countries improve as China and India grow, and also a set of six policy scenarios to position Malaysia so that it improves its competitiveness and takes advantage of the rapid changes in the region and the global economy.

Malaysia is expected to benefit substantially from growth in China and India as real incomes rise by an estimated US\$ 2.6 billion at 2004 prices. When we took into account a likely expansion of varieties and improved quality of exports from China and India, the gains to Malaysia more than doubled to an estimated US\$ 6.2 billion. Extra growth of China and India is likely to raise Malaysia's welfare due to an expected expansion of Malaysia's natural resource and agricultural exports, even though overall exports, especially those of some manufacturing and service sectors, are likely to contract as a result of intensified third-market competition.

FTAs with China and India may not be an effective policy for softening the impact on manufacturing industries in Malaysia as in many industries the FTA reinforces the effects from high growth in the two Giants by providing firms in China and India with favorable treatment

relative to other firms. MFN liberalization is found to lead to greater welfare gains and a positive impact on output in many more industries than an FTA with China or India, and most importantly on a number of manufacturing sectors expected to be hit by competition from India and China. Malaysia may consider increasing its investments in education and infrastructure as these will likely boost their manufacturing and services sectors, while improving trade logistics will benefit sectors with high transport costs including the agricultural and resource-based industries.

Some caveats and suggestions for potential future work are important. First, our results are based on general long-term global projections of the basic macroeconomic variables rather than precise sectoral predictions. While they show that China's and India's growth could be beneficial to Malaysia and certain sectors within the country, they offer only the broadest indications of likely effects. Our results suggest that benefiting from the growth of China and India will depend on adapting to the new opportunities and challenges. But by themselves these results cannot dictate the best adjustment path. These initial explorations should be supplemented with more detailed, sector-specific studies both to better identify emerging patterns and to consider in detail particular products and services.

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Table 1. Top 25 exports for China and Malaysia; entries in bold denote commodities common to both countries

2006 China Top 25 Exports			2006 Malaysia Top 25 Exports		
<i>Product Name</i>	<i>HS Code</i>	<i>Share (%)</i>	<i>Product Name</i>	<i>HS Code</i>	<i>Share (%)</i>
Portable digital data processing machinery	H1-847130	4.0%	Parts and accessories of data processing equipment nes	H1-847330	6.8%
Transmit-receive apparatus for radio, TV, etc.	H1-852520	3.7%	Petroleum oils, oils from bituminous minerals, crude	H1-270900	5.5%
Parts and accessories of data processing equipment nes	H1-847330	3.4%	Metal oxide semiconductor	H1-854213	5.3%
I/O units w/n storage u	H1-847160	2.7%	Portable digital data pr	H1-847130	4.1%
Parts for radio/tv transmit/receive equipment, nes	H1-852990	2.5%	Natural gas, liquefied	H1-271111	4.0%
Metal oxide semiconducto	H1-854213	1.9%	Hybrid integrated circui	H1-854240	3.3%
Optical devices, appliances and instruments, nes	H1-901380	1.4%	Petroleum oils & oils obta	H1-271000	3.3%
Storage units	H1-847170	1.2%	Monolithic integrated ci	H1-854230	2.7%
Color television receive	H1-852812	0.9%	Palm oil or fractions simply refined	H1-151190	2.7%
Video record/reproduction apparatus not magnetic tape	H1-852190	0.8%	Transmit-receive apparatus for radio, TV, etc.	H1-852520	2.5%
Electronic printed circuits	H1-853400	0.8%	Units of auto data proce	H1-847180	2.0%
Petroleum oils&oils obta	H1-271000	0.7%	Storage units	H1-847170	1.6%
Still image video camara	H1-852540	0.7%	I/O units w/n storage u	H1-847160	1.5%
Static converters, nes	H1-850440	0.7%	Commodities not specified according to kind	H1-999999	1.5%
Pullovers, cardigans etc of manmade fibres, knit	H1-611030	0.6%	Technically specified natural rubber (TSNR)	H1-400122	1.3%
Cargo containers designed for carriage	H1-860900	0.6%	Parts for radio/tv transmit/receive equipment, nes	H1-852990	1.3%
Sound reproducing apparatus, non-recording, nes	H1-851999	0.6%	Parts of electronic integrated circuits etc	H1-854290	1.0%
Footwear, sole rubber, plastics uppers of leather, nes	H1-640399	0.6%	Transistors, except photosensitive, > 1 watt	H1-854129	0.9%
Apparatus for carrier-cu	H1-851750	0.6%	Electrical control and distribution boards, < 1kV	H1-853710	0.8%
Footwear, outer soles/uppers of rubber or plastic, nes	H1-640299	0.5%	Electronic printed circuits	H1-853400	0.8%
T-shirts, singlets and other vests, of cotton, knit	H1-610910	0.5%	Plywood, outer ply of no	H1-441214	0.8%
Video games used with a television receiver	H1-950410	0.5%	Gloves other than surgical, of rubber	H1-401519	0.8%
Cargo vessels other than tanker or refrigerated	H1-890190	0.5%	Color television receive	H1-852812	0.8%
Dig auto data proc w/cpu	H1-847141	0.5%	Photosensitive/photovoltaic/LED semiconductor devices	H1-854140	0.6%
Digital process units wh	H1-847150	0.5%	Jewellery and parts of precious metal except silver	H1-711319	0.6%
Total Top 25 Exports for 2006		31.4%	Total Top 25 Exports for 2006		56.6%

Source: United National Commodity Trade Statistics database, accessed via the World Bank's World Integrated Trade Solution (WITS) software. Note: HS = Harmonized System

Table 2. Top 25 exports for India and Malaysia; entries in bold denote commodities common to both countries

2006 India Top 25 Exports			2006 Malaysia Top 25 Exports		
<i>Product Name</i>	<i>HS Code</i>	<i>Share (%)</i>	<i>Product Name</i>	<i>HS Code</i>	<i>Share (%)</i>
Petroleum oils&oils obta	H1-271000	14.5%	Parts and accessories of data processing equipment nes	H1-847330	6.8%
Diamonds (jewellery) worked but not mounted or set	H1-710239	8.0%	Petroleum oils, oils from bituminous minerals, crude	H1-270900	5.5%
Jewelry and parts of precious metal except silver	H1-711319	3.7%	Metal oxide semiconducto	H1-854213	5.3%
Iron ore, concentrate, not iron pyrites,unagglomerated	H1-260111	3.1%	Portable digital data pr	H1-847130	4.1%
Medicaments nes, in dosage	H1-300490	1.5%	Natural gas, liquefied	H1-271111	4.0%
Organic compounds, nes	H1-294200	1.4%	Hybrid integrated circui	H1-854240	3.3%
Copper cathodes and sections of cathodes unwrought	H1-740311	1.4%	Petroleum oils&oils obta	H1-271000	3.3%
Commodities not specified according to kind	H1-999999	1.2%	Monolithic integrated ci	H1-854230	2.7%
Rice, semi-milled or wholly milled	H1-100630	1.2%	Palm oil or fractions simply refined	H1-151190	2.7%
T-shirts, singlets and other vests, of cotton, knit	H1-610910	1.1%	Transmit-receive apparatus for radio, TV, etc.	H1-852520	2.5%
Flat rolled i/nas, coated with zinc, width >600mm, nes	H1-721049	1.1%	Units of auto data proce	H1-847180	2.0%
Cotton, not carded or combed	H1-520100	1.1%	Storage units	H1-847170	1.6%
Soya-bean oil-cake and other solid residues	H1-230400	0.8%	I/O units w/n storage u	H1-847160	1.5%
Womens, girls blouses & shirts, of cotton, not knit	H1-620630	0.8%	Commodities not specified according to kind	H1-999999	1.5%
Shrimps and prawns, frozen	H1-030613	0.7%	Technically specified natural rubber (TSNR)	H1-400122	1.3%
Motor vehicle parts nes	H1-870899	0.6%	Parts for radio/tv transmit/receive equipment, nes	H1-852990	1.3%
Furnishing articles nes, of cotton, not knit, crochet	H1-630492	0.6%	Parts of electronic integrated circuits etc	H1-854290	1.0%
Wire of refined copper > 6mm wide	H1-740811	0.6%	Transistors, except photosensitive, > 1 watt	H1-854129	0.9%
Bovine cuts boneless, frozen	H1-020230	0.5%	Electrical control and distribution boards, < 1kV	H1-853710	0.8%
Mens, boys shirts, of cotton, not knit	H1-620520	0.5%	Electronic printed circuits	H1-853400	0.8%
Automobiles, spark ignition engine of 1000-1500 cc	H1-870322	0.5%	Plywood, outer ply of no	H1-441214	0.8%
P-xylene	H1-290243	0.5%	Gloves other than surgical, of rubber	H1-401519	0.8%
Cashew nuts, shelled dri	H1-080132	0.4%	Color television receive	H1-852812	0.8%
Polypropylene in primary forms	H1-390210	0.4%	Photosensitive/photovoltaic/LED semiconductor devices	H1-854140	0.6%
Cut or sawn slabs of granite	H1-680223	0.4%	Jewellery and parts of precious metal except silver	H1-711319	0.6%
Total Top 25 Exports for 2006		46.4%	Total Top 25 Exports for 2006		56.6%

Source: United National Commodity Trade Statistics database, accessed via the World Bank's World Integrated Trade Solution (WITS) software. Note: HS = Harmonized System

Table 3. Malaysia's exports

Product Name	To China		
	(% of total exports)		
	2006	2004	2000
Raw materials	0.7%	0.8%	0.4%
Intermediate goods	1.6%	1.7%	0.8%
Consumer goods	1.3%	1.3%	0.6%
Capital goods	3.7%	3.0%	1.3%
Total	7.3%	6.7%	3.1%

	To India		
	(% of total exports)		
Raw materials	1.7%	0.9%	0.6%
Intermediate goods	0.6%	0.5%	0.2%
Consumer goods	0.4%	0.4%	0.7%
Capital goods	0.6%	0.6%	0.4%
Total	3.2%	2.4%	2.0%

	Total		
	(% of total exports)		
Raw materials	8.3%	7.2%	6.2%
Intermediate goods	15.4%	15.2%	11.8%
Consumer goods	25.4%	26.0%	25.2%
Capital goods	50.9%	51.6%	56.8%
Total	100.0%	100.0%	100.0%

Source: United Nations Commodity Trade Statistics database, accessed via WITS.

Table 4. China's exports

China Exports to India			
(% of total exports)			
	2006	2004	2000
Raw materials	0.1%	0.1%	0.1%
Intermediate goods	0.6%	0.5%	0.3%
Consumer goods	0.2%	0.1%	0.1%
Capital goods	0.6%	0.3%	0.1%
Total	1.5%	1.0%	0.6%

China Exports to Malaysia			
(% of total exports)			
Raw materials	0.1%	0.1%	0.1%
Intermediate goods	0.2%	0.2%	0.2%
Consumer goods	0.3%	0.3%	0.3%
Capital goods	0.8%	0.8%	0.5%
Total	1.4%	1.4%	1.0%

China Exports to the World			
(% of total exports)			
Raw materials	2.4%	3.2%	5.4%
Intermediate goods	17.0%	16.4%	17.2%
Consumer goods	37.4%	39.2%	49.7%
Capital goods	43.1%	41.2%	27.7%
Total	100.0%	100.0%	100.0%

Source: United Nations Commodity Trade Statistics database, accessed via WITS.

Table 5. Annual Output, Factor Inputs, and Population Growth Projections, 2005-2020, % pa

	GDP	Unskilled labor	Skilled labor	Capital	Population
Argentina & Brazil	3.6	0.9	3.6	3.1	1.0
Australia & New Zealand	3.4	1.6	0.6	3.8	0.7
Canada	2.6	1.6	0.9	3.2	0.4
China	6.6	0.8	3.9	8.5	0.6
EU & EFTA	2.4	0.3	0.1	2.6	0.0
Former Soviet Union	3.2	0.3	0.8	3.6	-0.1
Hong Kong and Taiwan (China)	4.3	0.6	2.9	4.9	0.3
India	5.5	1.6	4.0	6.1	1.1
Indonesia	5.2	2.7	6.5	4.7	1.1
Japan	1.6	0.2	-0.7	2.5	-0.2
Korea	4.7	2.0	5.8	4.9	0.3
Malaysia	5.6	-1.4	3.9	5.8	1.4
Middle East and North Africa	4.1	1.6	3.3	4.0	1.5
Mexico	3.8	2.7	4.6	3.3	1.4
Philippines	3.5	1.8	4.5	3.4	1.5
Rest of Latin America	3.3	1.6	3.9	3.4	1.4
Rest of the World	3.6	1.2	1.7	3.3	0.8
Rest of East Asia	3.1	1.3	4.2	3.7	1.0
Rest of South Asia	5.0	2.1	3.6	5.1	1.7
Singapore	4.9	0.6	1.1	5.3	0.8
Sub-Saharan Africa	3.5	2.6	3.3	3.1	1.9
Thailand	4.6	0.1	3.2	3.9	0.5
USA	3.2	1.5	0.8	3.9	0.7
Vietnam	5.4	1.4	1.9	6.0	1.1

Source: World Bank and Center for Global Trade Analysis (GTAP)

Table 6. Global Key Economic Indicators of the World Economy as a Result of Global Growth, 2005-2020, %

	Initial value share of output	Change in output	Contribution to global growth	Initial value share of exports	Change in exports	Contribution to global export growth	Change in world price
Rice	0.3	56.9	0.3	0.1	52.9	0.1	-1.1
Wheat	0.2	59.3	0.2	0.2	76	0.2	1.9
Grains	0.2	52.2	0.2	0.2	54.3	0.2	0.4
Fruits and vegetables	0.7	38.3	0.4	0.7	38.5	0.4	2.3
Oils and fats	0.4	82.2	0.5	0.7	77.7	0.9	-11.2
Sugar	0.2	50.2	0.2	0.1	68.1	0.1	-11.6
Plant-based fibers	0.1	85.3	0.1	0.1	110.2	0.2	4.3
Other crops	0.3	41.2	0.2	0.4	45.2	0.3	0.6
Livestock and meat	1.7	49.9	1.4	1	84.5	1.3	-10.2
Dairy	0.8	40.3	0.5	0.4	60.2	0.4	-12.9
Other processed food	3.1	44.1	2.3	3	40.6	1.9	-13.4
Energy	1.8	61.9	1.8	4.3	81.9	5.5	27.2
Textiles	1.1	63.5	1.2	2.8	54.5	2.4	-14.2
Wearing apparel	0.8	62.3	0.8	2	48.4	1.5	-15.6
Leather	0.3	54.6	0.3	1	43	0.7	-14
Wood and paper products	3.2	55.9	3.0	3.9	53.7	3.3	-15.2
Minerals	1.6	68.8	1.8	2.2	71.4	2.5	-14.5
Chemicals, Rubber, Plastics	4.8	52.6	4.2	12.2	55.6	10.6	-14
Metals	4.1	63.1	4.3	7.1	64.1	7.1	-15.1
Motor vehicles	3.9	52.8	3.4	11.6	55.7	10.1	-15.1
Machinery and equipment	4.3	62.9	4.5	14.2	67.7	15.0	-15.4
Electronics	3.1	89.6	4.6	11.2	85.5	15.0	-17.9
Other manufactures	1	85.9	1.4	1.8	72.1	2.0	-18.4
Trade and transportation	16	61.5	16.2	6.9	66.6	7.2	-15.4
Communication	13.3	60.2	13.2	7.4	60.5	7.0	-18.2
Other services	32.7	61.3	33.1	4.3	63.3	4.3	-16.4
Total	100	58.8	100	100	64.4	100	-13.4

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004).

Table 7. Impact of China and India's extra growth on welfare and terms of trade

	Welfare				Terms of trade	
	Growth		Growth and quality		Growth	Growth and quality
	B\$	%	B\$	%	B\$	B\$
Australia and New Zealand	5.3	0.5	9.0	0.8	5.2	8.2
China	1041.2	28.9	1117.9	31.1	-57.4	21.9
Japan	-0.5	0.0	7.4	0.1	2.4	6.4
Korea	4.0	0.4	11.5	1.0	-0.6	4.4
Hong Kong and Taiwan (China)	2.6	0.4	11.0	1.5	2.7	10.7
Indonesia	1.2	0.3	2.1	0.5	1.1	1.6
Malaysia	2.6	1.2	6.2	2.8	1.9	4.1
Philippines	-0.5	-0.4	-0.4	-0.3	-0.5	-0.4
Singapore	-0.3	-0.2	2.3	1.3	0.4	2.9
Thailand	0.4	0.1	1.9	0.4	-0.1	1.0
Vietnam	0.6	0.8	1.2	1.6	0.6	1.3
Rest of East Asia	0.5	1.9	0.6	2.6	0.4	0.6
India	381.1	30.5	401.9	32.1	-14.3	6.9
Rest of South Asia	-0.9	-0.3	-0.2	-0.1	-0.6	0.3
Canada	3.5	0.3	5.3	0.4	3.7	4.8
USA	-1.5	0.0	12.6	0.1	4.6	21.8
Mexico	2.4	0.2	6.8	0.7	0.2	1.0
Argentina and Brazil	1.9	0.2	3.7	0.3	2.0	3.1
Rest of Latin America	3.8	0.5	5.7	0.8	3.5	4.8
EU and EFTA	-7.3	0.0	10.3	0.1	6.0	19.1
Former Soviet Union	8.7	0.8	11.9	1.2	9.1	11.6
Middle East and North Africa	23.7	1.0	31.2	1.4	24.2	31.5
Sub-Saharan Africa	6.3	0.8	9.9	1.3	5.2	8.2
Rest of the World	0.3	0.1	1.7	0.7	-0.3	0.6

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004).

Table 8. Impact of China and India's extra growth on trade

	Exports		Imports	
	Growth	Growth and quality	Growth	Growth and quality
Australia and New Zealand	1.1	2.8	4.1	5.9
China	33.4	60.2	28.4	65.0
Japan	3.1	5.3	7.5	10.4
Korea	3.3	5.8	3.8	6.4
Hong Kong and Taiwan (China)	1.2	3.5	2.2	4.0
Indonesia	-0.1	0.3	0.4	-0.4
Malaysia	-0.9	-0.2	-0.2	0.4
Philippines	0.3	0.1	-0.4	-2.2
Singapore	1.5	3.7	2.0	3.6
Thailand	1.0	2.0	0.8	0.8
Vietnam	-0.6	-0.6	0.0	-0.8
Rest of East Asia	-1.2	-0.8	2.6	2.7
India	40.3	67.6	34.1	67.8
Rest of South Asia	0.9	1.6	-0.3	-1.5
Canada	-0.7	-0.9	0.4	0.0
USA	1.2	3.0	2.2	2.7
Mexico	1.3	3.4	0.2	0.2
Argentina and Brazil	0.8	1.4	2.6	2.9
Rest of Latin America	-0.2	0.5	1.5	1.8
EU and EFTA	0.2	0.1	0.7	0.2
Former Soviet Union	-0.2	1.0	1.7	2.4
Middle East and North Africa	-1.5	-0.7	1.7	1.9
Sub-Saharan Africa	-0.1	1.1	2.3	3.0
Rest of the World	1.5	1.9	0.5	0.5

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004).

Table 9. Impact of China and India's extra growth on Malaysia; change in quantities in percent (*China=impact of China's growth alone)

	Output				Exports				Imports			
	Growth		Growth and quality		Growth		Growth and quality		Growth		Growth and quality	
	Malaysia	China*	Malaysia	China*	Malaysia	China*	Malaysia	China*	Malaysia	China*	Malaysia	China*
Rice	0.3	0.3	-0.1	0.1	-6.4	-2.7	-1.1	3.9	3.5	2.6	5.8	4.0
Wheat	5.0	6.6	8.9	9.6	4.8	6.4	8.6	9.4	8.2	5.4	8.7	4.7
Grains	1.9	1.1	1.5	0.9	-4.3	-1.7	-3.3	-0.5	5.1	3.3	4.8	2.8
Fruits and vegetables	1.7	1.8	1.8	2.4	17.2	17.7	22.7	22.6	1.0	1.2	1.5	1.7
Oils and fats	22.6	15.1	26.1	15.2	23.5	15.6	27.4	15.9	13.1	8.2	18.6	10.6
Sugar	-1.9	-1.2	-2.7	-1.7	-6.6	-4.3	-7.4	-4.7	2.7	2.0	4.4	3.4
Plant-based fibers	-0.2	-0.8	-1.1	-1.8	15.2	5.4	18.3	8.5	6.4	4.1	7.7	4.0
Other crops	-1.7	-1.4	-2.4	-1.8	-1.6	-5.0	1.2	-5.3	0.9	1.6	1.3	2.0
Livestock and meat	-0.9	-0.5	-1.0	-0.5	-1.0	0.8	0.1	1.8	2.6	1.7	5.8	4.2
Dairy	-1.3	-1.2	2.8	1.9	-1.4	-1.3	3.2	2.2	-0.2	-0.2	2.0	1.4
Other processed food	1.4	1.5	1.2	1.6	3.2	3.6	3.4	4.0	0.4	0.2	1.7	1.3
Energy	1.8	1.2	1.6	1.1	6.7	4.1	7.5	4.5	7.5	4.2	10.4	6.3
Textiles	-2.7	-4.0	-5.8	-9.6	-1.3	-3.8	-1.1	-7.8	-1.0	-1.2	-2.5	-3.3
Wearing apparel	-7.3	-6.1	-14.8	-13.1	-7.6	-6.3	-15.0	-13.2	2.0	1.7	0.4	0.0
Leather	-1.1	-0.9	5.8	3.7	-1.2	-1.1	7.0	4.6	-0.1	-0.1	-1.1	-1.5
Wood and paper products	1.0	1.5	2.4	2.6	2.9	3.1	6.5	5.8	-0.4	-0.2	2.4	2.1
Minerals	-1.8	-0.6	-3.0	-1.0	2.4	3.4	3.4	5.4	-2.0	-1.5	-1.6	-1.0
Chemicals, Rubber, Plastics	-0.1	0.2	0.1	0.9	1.6	1.5	3.9	4.0	0.8	0.5	2.6	2.0
Metals	-4.5	-2.4	-6.1	-3.2	-4.5	-2.4	-3.3	-1.3	-2.6	-2.1	-2.8	-1.9
Motor vehicles	-1.9	-1.2	-3.3	-2.3	-3.8	-2.5	-5.8	-4.4	0.1	0.2	1.2	1.2
Machinery and equipment	-8.6	-5.8	-11.4	-7.0	-8.3	-5.5	-9.1	-5.0	0.7	0.5	0.7	0.5
Electronics	-6.8	-5.2	-7.2	-5.1	-6.6	-5.1	-6.6	-4.5	-3.0	-2.2	-3.7	-2.8
Other manufactures	-4.7	-3.3	-6.2	-4.2	-18.6	-12.1	-25.6	-15.9	8.7	8.0	12.0	10.9
Trade and transportation	-1.5	-0.9	-1.6	-0.8	-0.6	0.4	0.0	1.4	0.9	0.3	3.6	2.4
Communication	0.8	0.8	0.1	0.0	-4.2	-2.1	-7.3	-4.7	3.5	2.0	5.8	3.9
Other services	0.4	0.4	1.0	1.0	-3.6	-2.0	-5.9	-3.8	3.0	2.0	7.0	5.1

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004).

Table 10. Impact of China and India's extra growth on Malaysia's exports; change in quantities in percent

	Asia & Australia New Zealand		India and China		N. America		Latin America		EU and M. East		Africa and ROW		All except India & China		All
	G	G&Q*	G	G&Q	G	G&Q	G	G&Q	G	G&Q	G	G&Q	G	G&Q	G
Rice	-11.3	-12.9	53.0	119.7	-11.1	-16.2	-18.1	-22.4	-23.6	-29.7	-10.7	-15.7	-15.0	-18.7	-6.4
Wheat	24.6	30.4	77.5	121.4	21.9	32.0	11.6	19.8	-9.3	-6.8	-1.2	3.1	4.8	8.6	4.8
Grains	-3.5	-2.8	84.4	108.7	-4.0	-1.6	-8.8	-8.0	-11.4	-11.4	-11.2	-11.3	-6.6	-6.1	-4.3
Fruits and vegetables	5.0	6.3	114.5	152.1	-11.2	-12.2	-13.9	-15.4	-18.0	-20.7	-16.3	-17.9	3.8	4.9	17.2
Oils and fats	5.7	4.7	46.0	56.1	7.8	5.8	9.5	7.7	2.8	0.8	4.2	3.4	4.4	3.0	23.5
Sugar	-6.5	-7.1	30.5	41.0	-11.9	-15.2	-13.1	-16.5	-15.9	-19.9	-12.7	-15.2	-7.7	-8.7	-6.6
Plant-based fibers	6.3	9.4	72.6	81.2	3.6	5.6	5.3	9.8	-6.0	-5.7	10.6	12.8	0.1	1.7	15.2
Other crops	-5.5	-4.6	82.7	125.5	-5.2	-4.0	-11.2	-11.4	-13.6	-14.8	-8.2	-7.1	-6.0	-5.2	-1.6
Livestock and meat	-5.9	-6.9	72.2	104.0	-9.8	-12.9	-13.4	-17.5	-18.1	-22.9	-15.0	-18.1	-7.1	-8.6	-1.0
Dairy	-2.4	2.4	59.6	87.5	-6.6	-5.6	-4.6	-2.3	-6.2	-3.8	-7.4	-4.8	-4.1	-0.4	-1.4
Other processed food	0.9	0.0	50.2	73.1	-2.3	-5.2	-1.8	-4.3	-2.7	-5.2	-1.1	-2.7	-0.3	-1.8	3.2
Energy	0.9	0.4	29.3	34.2	-17.6	-17.6	-20.6	-20.0	-16.3	-16.2	-13.3	-12.3	-0.1	-0.6	6.7
Textiles	-8.5	-22.0	24.3	59.9	-9.4	-16.3	-8.5	-15.4	-9.5	-17.2	-8.4	-21.1	-9.0	-19.3	-1.3
Wearing apparel	-13.0	-27.5	22.7	75.9	-6.1	-12.0	-8.3	-17.1	-6.7	-12.5	-11.1	-24.2	-7.9	-15.8	-7.6
Leather	-1.1	2.2	19.8	102.2	-1.5	-5.4	1.1	4.3	-3.1	4.2	-1.0	1.3	-2.1	3.2	-1.2
Wood and paper products	-1.8	-5.7	26.6	68.9	-3.6	-10.9	-3.3	-9.4	-2.7	-8.0	-0.9	-4.4	-2.3	-7.2	2.9
Minerals	-3.9	-7.0	28.5	47.6	-5.1	-10.2	-2.8	-5.9	-3.4	-7.3	-2.5	-4.9	-3.8	-7.2	2.4
Chemicals, Rubber, Plastics	-4.9	-12.2	19.8	48.0	-6.4	-14.0	-5.2	-11.6	-4.5	-10.7	-4.5	-12.3	-5.0	-12.0	1.6
Metals	-10.3	-17.2	20.5	64.7	-8.8	-16.3	-5.9	-10.5	-5.1	-9.7	-8.2	-15.4	-9.0	-15.5	-4.5
Motor vehicles	-5.4	-9.3	14.9	52.2	-3.9	-8.7	-3.4	-7.0	-3.9	-7.7	-4.7	-8.4	-4.8	-8.7	-3.8
Machinery and equipment	-13.2	-20.9	12.1	55.3	-10.8	-20.0	-9.3	-16.9	-9.2	-16.4	-12.2	-21.6	-11.5	-19.3	-8.3
Electronics	-18.1	-33.3	20.1	58.6	-19.6	-37.9	-20.1	-38.1	-16.4	-32.9	-15.9	-32.5	-18.2	-34.8	-6.6
Other manufactures	-22.1	-30.6	0.1	42.9	-23.3	-34.0	-21.1	-30.9	-17.2	-25.8	-15.6	-23.0	-19.3	-28.1	-18.6
Trade and transportation	-5.7	-8.0	14.5	38.2	-6.7	-11.0	-5.3	-9.3	-6.6	-10.9	-5.3	-8.4	-6.3	-10.2	-5.4
Communication	-4.0	-6.4	6.5	28.6	-4.2	-8.9	-3.6	-7.4	-5.0	-9.3	-3.2	-6.2	-4.6	-8.6	-4.2
Other services	-2.9	-4.3	14.4	42.2	-4.6	-8.5	-2.9	-6.0	-4.4	-8.0	-2.3	-4.4	-4.1	-7.4	-3.6

Source: Authors' simulations with GTAP-DD (lanchovichina, 2004). *G&Q denotes the case when growth is accompanied by improvements in quality and variety.

Table 11. World price changes and Malaysia's terms of trade gains in the growth only scenario

	World price change (%)			Malaysia's gains in millions of US\$ from change in:			
	Total	China effect	India effect	World price	Export price	Import price	Welfare change
Rice	1.2	0.5	0.7	-12.3	0.1	-3.0	-12.2
Wheat	2.7	2.4	0.3	-31.7	0.0	-11.4	-31.8
Grains	2.5	2.2	0.3	-27.0	0.0	-11.8	-27.0
Fruits and vegetables	2.1	1.8	0.3	-38.7	5.4	-35.1	-33.3
Oils and fats	-0.2	-0.1	-0.1	228.5	-129.3	-5.8	99.2
Sugar	-0.5	-0.4	-0.2	-3.8	0.4	-5.3	-3.4
Plant-based fibers	3.4	2.6	0.8	-13.6	-0.1	3.9	-13.6
Other crops	1.2	0.8	0.3	-23.7	0.7	-6.4	-23.0
Livestock and meat	-0.1	0.0	-0.1	-10.3	1.5	-7.4	-8.8
Dairy	-0.7	-0.5	-0.2	-1.9	1.6	-5.7	-0.3
Other processed food	-0.7	-0.5	-0.3	-1.6	10.9	-16.6	9.4
Energy	6.4	4.4	2.0	398.3	108.5	-3.7	506.8
Textiles	-1.1	-0.8	-0.2	0.1	13.3	-1.9	13.4
Wearing apparel	-1.7	-1.4	-0.3	-1.5	8.6	4.5	7.1
Leather	-1.2	-0.8	-0.4	0.9	0.6	-0.5	1.5
Wood and paper products	-1.4	-1.0	-0.4	-16.1	23.2	-3.6	7.1
Minerals	-1.3	-0.8	-0.5	3.2	9.2	1.7	12.4
Chemicals, Rubber, Plastics	-1.0	-0.8	-0.2	2.9	113.8	-9.8	116.6
Metals	-1.7	-1.2	-0.6	52.5	36.8	24.4	89.3
Motor vehicles	-1.6	-1.2	-0.4	58.6	9.4	-0.7	68.0
Machinery and equipment	-2.1	-1.6	-0.5	168.2	114.4	71.6	282.6
Electronics	-2.7	-2.3	-0.4	-429.9	1103.1	-51.5	673.2
Other manufactures	-3.4	-2.7	-0.7	-14.0	44.1	1.2	30.1
Trade and transportation	-1.2	-0.9	-0.3	14.2	77.8	-12.0	92.0
Communication	-2.0	-1.3	-0.7	48.9	37.3	1.7	86.2
Other services	-1.6	-1.1	-0.4	23.0	29.3	-3.2	52.2
Total TOT				373.1	1620.6	-86.4	1993.7
Other welfare gains							655.5
Total welfare gain							2649.2

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004).

Table 12. Welfare impacts of policy responses to growth of China and India, 2004 US\$ million

	Growth	Difference from Growth scenario						
		G&Q*	FTA with China	FTA with India	MFN liberalization	Human capital	Physical capital	Trade logistics
Australia and New Zealand	5,305.6	3,682.8	-121.8	-106.6	-76.3	37.8	199.4	27.2
China	1,041,238.8	76,637.0	1,959.9	-471.1	-258.2	-171.7	367.5	368.1
Japan	-467.5	7,855.6	-323.6	-99.5	195.9	-64.6	102.7	164.3
Korea	3,968.3	7,551.4	-26.7	-41.2	854.1	-21.5	-131.3	28.4
Hong Kong & Taiwan (China)	2,619.8	8,362.8	-256.7	-40.3	102.3	-18.3	21.7	66.2
Indonesia	1,229.6	898.4	-103.7	-78.0	-124.7	19.7	44.0	30.5
Malaysia	2,649.1	3,510.8	3,225.4	2,073.3	6,534.0	8,890.9	20,355.5	3,343.5
Philippines	-517.1	115.0	-41.7	-5.3	-51.3	2.0	6.4	35.7
Singapore	-344.6	2,681.5	-471.9	-257.8	117.3	86.2	400.9	46.2
Thailand	353.4	1,567.0	-182.8	-88.8	-433.4	14.2	108.5	98.5
Vietnam	612.3	608.2	-81.1	-42.0	-73.9	7.5	58.3	15.9
Rest of East Asia	456.3	169.8	-19.5	-5.1	8.5	3.7	25.4	9.4
India	381,085.5	20,801.6	-527.7	4,445.7	-293.6	-64.9	144.9	110.3
Rest of South Asia	-861.0	663.3	-132.3	-68.9	-35.6	-14.5	124.4	104.5
Canada	3,475.3	1,839.6	-48.0	23.3	-55.7	23.7	97.6	-38.4
USA	-1,503.2	14,066.2	-868.7	-320.4	-602.1	-89.8	708.4	-17.0
Mexico	2,403.5	4,404.1	-75.2	-31.6	-128.7	20.5	307.5	-36.0
Argentina and Brazil	1,926.8	1,822.5	-676.6	-159.4	102.4	3.4	-128.1	-87.4
Rest of Latin America	3,773.5	1,955.9	-0.2	35.2	-44.2	27.2	108.4	-4.9
EU and EFTA	-7,291.4	17,565.4	-252.4	-221.2	-455.7	-170.0	1,050.9	-163.8
Former Soviet Union	8,733.0	3,165.3	-30.1	151.4	169.8	80.1	226.2	-4.7
Middle East and North Africa	23,745.5	7,494.4	-171.5	322.9	-257.7	220.6	848.8	160.4
Sub-Saharan Africa	6,274.6	3,616.5	-110.7	18.8	-122.0	46.2	246.2	39.4
Rest of the World	263.1	1,426.7	-19.1	-18.5	21.5	-7.5	39.6	-4.3

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004). *G&Q denotes the case when growth is accompanied by improvements in quality and variety.

Table 13. Impact on Malaysia's industry output of policy responses to growth of China and India, %

	Growth	Difference from Growth scenario						
		G&Q*	FTA with China	FTA with India	MFN liberalization	Human capital	Physical capital	Trade logistics
Rice	0.3	-0.4	-4.0	-1.3	3.2	-0.2	-0.5	-2.3
Wheat	5.0	3.9	-1.1	-2.2	427.7	-2.6	-11.5	6.8
Grains	1.9	-0.4	-3.8	-1.6	-0.6	-0.2	-0.8	-1.5
Fruits and vegetables	1.7	0.2	0.2	-4.5	1.2	-0.2	0.9	2.3
Oils and fats	22.6	3.4	38.2	42.3	-8.9	-0.2	19.0	8.2
Sugar	-1.9	-0.8	-4.7	-3.7	8.8	-0.3	-2.0	-2.5
Plant-based fibers	-0.2	-1.0	-6.1	-3.1	8.3	-1.1	-7.0	-3.1
Other crops	-1.7	-0.6	-5.6	-3.9	-40.5	-0.8	-1.5	-1.0
Livestock and meat	-0.9	-0.1	-3.7	-2.7	11.6	1.0	-0.7	-2.0
Dairy	-1.3	4.1	28.8	-1.3	20.9	-0.3	-0.8	20.7
Other processed food	1.4	-0.1	-3.5	-0.3	-7.2	0.9	9.6	1.0
Energy	1.8	-0.2	-0.7	0.4	-1.0	-0.3	2.2	-0.2
Textiles	-2.7	-3.1	9.0	4.2	81.1	4.0	13.7	9.1
Wearing apparel	-7.3	-7.5	30.6	-4.9	56.6	1.2	16.6	6.0
Leather	-1.1	6.8	130.5	4.7	152.9	1.2	8.6	19.3
Wood and paper products	1.0	1.4	-11.6	-5.3	-9.9	-1.1	14.5	19.8
Minerals	-1.8	-1.2	-9.5	-4.6	-10.9	4.8	14.3	6.0
Chemicals, Rubber, Plastics	-0.1	0.2	11.9	-5.1	12.4	3.0	24.5	7.6
Metals	-4.5	-1.6	-5.4	-3.5	0.2	6.0	20.7	3.7
Motor vehicles	-1.9	-1.4	-6.3	-3.8	31.9	5.1	10.6	-2.7
Machinery and equipment	-8.6	-2.8	-1.8	-7.8	6.1	7.5	18.8	-1.9
Electronics	-6.8	-0.4	-11.8	-9.4	-4.4	4.2	22.3	-7.9
Other manufactures	-4.7	-1.5	-0.4	-2.9	3.3	4.2	15.3	-1.4
Trade and transportation	-1.5	-0.1	-4.0	-2.9	-0.8	5.1	16.3	-2.9
Communication	0.8	-0.7	-0.6	1.5	-3.5	8.2	17.5	-1.8
Other services	0.4	0.6	0.2	-0.1	3.1	8.4	9.5	-0.1

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004). *G&Q denotes the case when growth is accompanied by improvements in quality and variety.

Table 14. Impact on Malaysia's exports of policy responses to growth of China and India, %

	Difference from Growth scenario							
	Growth	G&Q*	FTA with China	FTA with India	MFN liberalization	Human capital	Physical capital	Trade logistics
Rice	-6.4	5.2	-31.3	11.1	28.0	-8.5	-34.2	-9.1
Wheat	4.8	3.9	-1.3	-2.5	432.8	-2.6	-11.8	7.1
Grains	-4.3	1.1	-17.1	-12.8	6.5	-4.9	-26.0	-4.4
Fruits and vegetables	17.2	5.5	-3.9	-0.2	-1.7	-6.8	-40.2	15.4
Oils and fats	23.5	3.9	41.3	45.8	-9.0	-0.3	18.1	9.1
Sugar	-6.6	-0.7	36.6	-8.5	21.6	-7.5	-24.1	24.6
Plant-based fibers	15.2	3.1	-21.8	-5.2	-21.7	-7.5	-32.5	-10.1
Other crops	-1.6	2.8	-30.5	67.2	697.8	-8.1	-51.0	0.0
Livestock and meat	-1.0	1.1	-12.0	-13.1	57.9	-9.4	-32.1	2.3
Dairy	-1.4	4.7	32.5	-1.3	22.2	-1.0	-2.4	23.6
Other processed food	3.2	0.2	2.5	1.7	65.5	-3.4	7.4	5.3
Energy	6.7	0.7	-1.3	8.6	10.5	-3.8	-7.0	1.4
Textiles	-1.3	0.2	38.2	11.9	142.2	3.5	11.8	15.7
Wearing apparel	-7.6	-7.4	47.2	-2.6	78.2	0.5	16.4	8.1
Leather	-1.2	8.2	152.1	5.7	177.0	0.8	8.0	22.1
Wood and paper products	2.9	3.6	-12.0	-5.4	-4.2	-4.0	11.8	34.8
Minerals	2.4	1.0	-1.7	-3.8	-5.2	0.3	7.3	31.2
Chemicals, Rubber, Plastics	1.6	2.3	23.0	-4.2	21.7	2.1	24.0	14.4
Metals	-4.5	1.2	-2.6	-1.1	19.5	4.6	19.5	11.9
Motor vehicles	-3.8	-2.0	0.4	-2.6	270.3	3.7	5.7	-2.6
Machinery and equipment	-8.3	-0.8	5.5	-6.8	16.9	7.0	16.9	0.1
Electronics	-6.6	0.1	-11.7	-9.5	-4.3	4.1	22.2	-7.9
Other manufactures	-18.6	-6.9	14.6	-7.5	19.3	1.5	16.1	-7.2
Trade and transportation	-0.6	0.6	-11.1	-6.4	-5.5	5.0	10.8	-8.3
Communication	-4.2	-3.1	-16.7	-8.1	-13.3	17.8	15.7	-12.2
Other services	-3.6	-2.3	-13.8	-7.6	-6.3	18.5	10.2	-11.0

Source: Authors' simulations with GTAP-DD (Ianchovichina, 2004). *G&Q denotes the case when growth is accompanied by improvements in quality and variety.

Table 15. Average tariffs by product in Malaysia, 2004, %

	Exporters:		
	China	India	Others
Rice	0	0	0
Wheat	0	0	0
Grains	0	0	0
Fruits and vegetables	2.9	0.2	6.9
Oils and fats	1.1	0.8	0.5
Sugar	0.1	0	0
Plant-based fibers	0	0	0
Other crops	28.6	17.4	106.5
Livestock and meat	2.2	0.1	1.2
Dairy	1.5	0.1	0.7
Other processed food	36.4	7.9	40.3
Energy	4	10.9	3.4
Textiles	18.6	14.8	10
Wearing apparel	19.2	18.2	10.7
Leather	17.7	4.9	2
Wood and paper products	14.4	3.3	5.4
Minerals	17.3	7.4	4.6
Chemicals, Rubber, Plastics	6.2	2.6	3.9
Metals	6.9	5.7	6
Motor vehicles	19	23.7	27.9
Machinery and equipment	7.3	5.1	3.8
Electronics	2.2	1.5	0.7
Other manufactures	8.7	1.9	6.2
Trade and transportation	0	0	0
Communication	0	0	0
Other services	0	0	0

Source: World Bank and Center for Global Trade Analysis (GTAP)