Discussion Paper #40

# Quantitatively Assessing a BIMSTEC-Japan FTA: A CGE Analysis

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# Contents

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**Anna Strutt***

***Abstract:*** The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a sub-regional economic grouping comprising Bangladesh, India, Nepal, Myanmar, Bhutan, Thailand and Sri Lanka. The BIMSTEC Free Trade Framework Agreement sets out a program of ambitious preferential trade liberalization between the member countries. There has also been some discussion of promoting further economic integration with Japan. However, incorporating Japan into the preferential trade agreement would substantially change the composition of the group, offering a new range of opportunities and challenges for BIMSTEC economies.

The current paper uses a dynamic global trade model in an effort to improve understanding of the potential impacts of a BIMSTEC-Japan Free Trade Agreement (FTA). We develop a baseline scenario to 2020 using GTAP-Dyn, a recursive dynamic version of the Global Trade Analysis Project (GTAP) model. From this, carefully developed scenarios facilitate quantification of the impacts of progressive liberalization within the BIMSTEC FTA, both with and without the inclusion of Japan and also sensitive product liberalization. Our tentative results suggest that if the FTA is extended to include Japan, significant gains are likely for both the BIMSTEC region as a whole and for Japan. However, we find substantial variation in the impacts on individual BIMSTEC member economies, with results depending upon the exact form of the liberalization, including the timing of reform, the use of sensitive product categories and special treatment for countries

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categorized as Least Developed Countries. We also note the dynamic nature of the global trading environment, with implementation of other preferential agreements likely to impact on the outcomes of the agreements discussed here.

## 1. Introduction and background

The Bay of Bengal Initiative for Multi-Sectorial Technical and Economic Cooperation (BIMSTEC) is a sub-regional economic grouping comprising Bangladesh, India, Nepal, Myanmar, Bhutan, Thailand and Sri Lanka.[1] The BIMSTEC Free Trade Framework Agreement is an ambitious preferential trade agreement between these member countries. There has been some discussion of the potential for Japan to join the BIMSTEC Free Trade Agreement (FTA),[2] with suggestions that there may be a very high opportunity cost of not increasing integration between BIMSTEC and Japan (Bhattacharya and Bhattacharyay, 2006). While enlarging this preferential trade agreement to include Japan is likely to offer significant further gains, there is also some apprehension about possible risks (CSIRD, 2007). The current paper uses a dynamic global trade model in an effort to better understand some of the potential impacts of a BIMSTEC-Japan Free Trade Agreement.

Although geographically close, BIMSTEC member counties are rather diverse in terms of their size and their economies. Table 1 presents some summary indicators for the region. Population ranges from over one billion in India to well under a million in Bhutan. It is therefore no surprise that the total size of the economies varies greatly, with the extremes again being India and Bhutan. While gross national income (GNI) per capita in the sub-region is generally low, the more export-oriented economies (indicated in the final column of Table 1, showing the ratio of exports to GDP) tend to have relatively high per capita incomes. Thai exports are valued at over 70 percent of GDP and the average per capita income of Thailand is the highest in the sub-region, at over US$ 3,000. For Sri Lanka and Bhutan, exports comprise around 30 percent of GDP and per capita incomes are a little under half that of Thailand. The four remaining countries have exports equal to 20 percent or less of GDP and per capita incomes of under US$ 1,000. Japan is strikingly different from all of the

BIMSTEC member countries, as shown in the final row of Table 1. The average per capita income in Japan is more than ten times that of even Thailand and the size of Japan's economy is more than four times as large as that of even India. Incorporating Japan into the FTA would therefore substantially change the composition of the group, offering a new array of opportunities and challenges.

**Table 1: Summary Indicators for BIMSTEC and Japan, 2006**

| | Population (million) | GDP (current US$ billion) | GNI per capita (US$) | Exports/ GDP (%)[a] |
|---|---|---|---|---|
| Bangladesh | 156.0 | 61.9 | 450 | 19.0 |
| Bhutan | 0.6 | 0.9 | 1,430 | 31.6 |
| India | 1,109.8 | 911.8 | 820 | 23.0 |
| Myanmar | 48.4 | n.a. | n.a. | n.a. |
| Nepal | 27.6 | 8.9 | 320 | 13.6 |
| Sri Lanka | 19.9 | 27.0 | 1,310 | 31.6 |
| Thailand | 63.4 | 206.3 | 3,050 | 73.7 |
| Japan | 127.8 | 4,368.4 | 38,630 | 14.3 |

[a] 2005 for Japan
***Source:*** World Bank, WDI, 2008.

## 2. Modelling a BIMSTEC-Japan FTA

### *Methodology*

To analyse some of the potential impacts of Japan joining a BIMSTEC FTA, we use *GTAP-Dyn*, a recursive dynamic version of the Global Trade Analysis Project (GTAP) model. The GTAP model and database are widely used internationally, fully documented and publicly available.[3] Using a global computable general equilibrium (CGE) model such as GTAP enables interactions between regions and sectors to be captured within a fully consistent framework.

The *GTAP-Dyn* model permits capital accumulation, along with international mobility and foreign ownership of capital (Ianchovichina and McDougall, 2001). Other features of the standard version of the GTAP model are retained (Hertel, 1997). For example, consumers maximize welfare, subject to their budget limitations and a relatively

sophisticated representation of consumer demand allows for regional differences in the price and income elasticities of demand. Firms maximize profits using the limited resources available in the economy. Five primary factors of production (land, natural resources, physical capital, unskilled and skilled labor) combine with intermediate inputs, including imports, to produce final output. Armington elasticities specify the extent to which substitution is possible between imports from various sources as well as substitution between imports and domestic production. Markets are assumed to be perfectly competitive with constant returns to scale (CRS). When a policy change is simulated, prices and quantities of commodities along with other impacts including on welfare and incomes, are endogenously determined within the model.[4]

In the current study, we use version 6 of the GTAP database, comprising 87 regions and 57 sectors (Dimaranan, 2006). This database is extended to facilitate analysis of dynamic capital accumulation (Walmsley, 2006) and aggregated to 26 regions for running the simulations. Of the BIMSTEC member countries, Bangladesh, India, Sri Lanka and Thailand are available in as separate countries in the GTAP database. However, Myanmar, Bhutan and Nepal are included in regional groupings with other countries.[5] Myanmar is including in a region which also covers Cambodia, Lao PDR, Timor and Brunei. Since Myanmar is the dominant economy in this region, we include the Myanmar-composite region within the BIMSTEC group.[6] In contrast, the Rest of South Asia grouping, within which Bhutan and Nepal fall, is dominated by the non-BIMSTEC economy of Pakistan and we therefore have to exclude Bhutan and Nepal from our current analysis. The 57 commodities in the GTAP database are aggregated up to 24 sectors. This sectoral disaggregation is designed to capture sectors of particular significance to BIMSTEC members, including relatively heavy disaggregation of agricultural and labour-intensive manufactures.

The advantages and disadvantages of CGE modelling are well documented in a range of literature and there are of course limitations in using a global trade model such as in this study. We have already

mentioned some problems arising with the currently available database: in particular it does not cover all BIMSTEC economies and sectors cannot be disaggregated to a very high level of detail. In addition, there may be relatively high levels of informal trade between some countries such as India and Bangladesh (Siriwardana and Yang, 2007), the impacts of which are difficult for any data-based model to capture.

### *Baseline projection*

We develop a baseline 'business as usual' projection from the benchmark GTAP v6 dynamic database through to 2020. To project the baseline global economy forward in time, exogenous projections of each region's GDP growth, as well as endowments of population, skilled and unskilled labor are needed for each region in our aggregation (Walmsley 2006).[7] Total factor productivity and capital stock growth are endogenous in the baseline, accommodating the combination of these exogenous shocks. Table 2 details the assumptions made for BIMSTEC economies and Japan. The baseline initial tariffs are the estimates developed by CEPII (Bchir, Jean and Laborde, 2005).[8] EU enlargement and WTO commitments are then incorporated into the 2005 baseline,[9] along with elimination of Multi Fibre Arrangement (MFA) quotas. The baseline projection should much better capture the underlying structures of the economies at the time they liberalize. Simulations that include implementation of the FTA are then compared with this baseline.

The baseline simulation captures the significant ways in which the structure of the world economy is anticipated to change by 2020. Changes in the structure of production for each region are driven by differences in the relative rates of factor accumulation, including endogenous capital growth. These combine with different factor intensities in each sector, as well as region-specific price and income elasticities. Given the differential that is typical between the growth rates of developed and developing countries, the regions comprising predominantly developing regions tend to increase their share of global GDP most significantly, with relatively large changes in the structure of output in these economies (Anderson, Hoekman and Strutt, 2001).

This baseline scenario provides a picture of how the global economy and world trade might look at the time of implementation of the FTA. It also facilitates analysis of how the trade agreement may impact economies over time, relative to what would have been the case without implementation of these agreements. Table 3 shows the changes in contribution to global GDP for BIMSTEC and Japan in the baseline scenario to 2020.

**Table 2: Projection assumptions: cumulative changes in GDP and factor endowments for BIMSTEC regions and Japan, 2001-2020 (%)**

| | GDP | Population | Unskilled labour | Skilled labour |
|---|---|---|---|---|
| Bangladesh | 156.5 | 32.8 | 43.9 | 102.6 |
| India | 185.5 | 25.5 | 35.6 | 121.5 |
| Myanmar-composite | 77.7 | 21.2 | 28.5 | 100.5 |
| Sri Lanka | 207.9 | 23.5 | 14.9 | 119.6 |
| Thailand | 150.8 | 11.1 | 0 | 88.6 |
| Japan | 39.2 | -3.4 | 3.1 | -11.6 |

As indicated in Table 3, the share of global GDP contributed developing countries increases over time. In particular, the BIMSTEC economies are projected to significantly increase their share of global GDP and also global exports and imports. For example, Sri Lanka's contribution to the global economy is projected to increase from 0.05 percent to almost 0.09 percent. On the other hand, as is the case for

**Table 3: Projected baseline changes in the contributions of BIMSTEC and Japan economies to global GDP, exports and imports (%)**

| | Proportion of world GDP | | Proportion of world exports | | Proportion of world imports | |
|---|---|---|---|---|---|---|
| Region | 2001 | 2020 | 2001 | 2020 | 2001 | 2020 |
| Bangladesh | 0.15 | 0.21 | 0.11 | 0.24 | 0.14 | 0.14 |
| India | 1.53 | 2.41 | 0.86 | 2.47 | 0.81 | 0.92 |
| Sri Lanka | 0.05 | 0.09 | 0.09 | 0.16 | 0.09 | 0.12 |
| Thailand | 0.37 | 0.51 | 1.16 | 1.47 | 0.88 | 1.07 |
| BIMSTEC Total[10] | 2.35 | 3.47 | 2.31 | 4.51 | 2.02 | 2.36 |
| Japan | 13.36 | 10.29 | 6.52 | 2.42 | 5.74 | 5.97 |

many developed economies, Japan is projected to decrease in relative size over time. Japan begins the period contributing over 13.3 percent of global GDP but is projected to contribute less than 10.3 percent of global economic output by 2020.

### *Liberalization scenarios*

From the baseline described above, three alternative scenarios are modeled. The first simulation is implementation of an ambitious BIMSTEC FTA. The BIMSTEC Framework Agreement specifies both fast and normal track goods, with different timing commitments for LDCs and non-LDCs (BIMSTEC, 2004).[11] In particular, for normal track products, the non-LDCs have agreed to eliminate tariffs imposed on the LDCs by 30 June 2010 and tariffs among themselves by 30 June 2012. LDCs are committed under this agreement to eliminating tariffs among themselves by 30 June 2015 and for other BIMSTEC countries by 30 June 2017. We model these different timing obligations for LDCs and non-LDCs, in the current study; however, we initially assume implementation of full tariff removal for all goods at the agreed deadline for normal track goods.

In the second scenario, we consider the impact of Japan participating in the FTA, under the assumption that Japan follows the same timeline for liberalization as do non-LDC members of BIMSTEC. The third scenario includes the impact of allowing a number of sectors to be classified as 'sensitive', with each country permitted to maintain a number of products on their Sensitive Lists, for which no tariff concessions are required. The available lists of sensitive products are difficult to precisely model, particularly within a relatively highly aggregated global trade model.[12] We, therefore, work with the rather simple but transparent assumption that five out of the twenty-four sectors in our aggregation will not be liberalized. These sectors are selected as sensitive because of the comparatively high tariffs that participating economies tend to impose in these sectors and because of the relative importance of these sectors. The sectors assumed to be sensitive are: rice; vegetables and fruit; cattle and sheep meat products; dairy products; and textiles. Table 4 summarizes the three scenarios modeled.

**Table 4: Summary of scenarios modelled**

| | |
|---|---|
| Scenario 1. | BIMSTEC<br>Non-LDC countries eliminate all tariffs imposed on LDCs in 2010 and between themselves in 2012. LDCs eliminate all tariffs imposed on one another in 2015, with elimination of remaining tariffs on non-LDCs in 2017. |
| Scenario 2. | BIMSTEC-Japan<br>As for Scenario 1, but with inclusion of Japan in the FTA, following the same liberalization timing as non-LDC countries. |
| Scenario 3. | BIMSTEC-Japan-Sensitive<br>As for scenario 2, but with the inclusion of 'sensitive products' that are not liberalized within the FTA. |

## 3. Results and discussion

What are the likely effects of the BIMSTEC FTA on member countries? How will the inclusion of Japan into the agreement impact on these and how much difference do sensitive products make? In this section, we use our simulation results to explore some of these issues, given the assumptions and scenarios described above.

Figure 1 shows the projected impact on real GDP for each economy with implementation of the BIMSEC FTA specified in Scenario 1. There are clear and substantial gains from liberalization for most BIMSTEC members. In particular, Thailand's real output gain is projected to increase by 1.2 percent in 2020. For other BIMSTEC economies, the gains are more moderate, though still significant, with the overall level of real GDP in BIMSTEC member economies projected to increase by just over 0.3 percent per annum in 2020 as a result of the FTA. One rather striking finding is that the LDC-categorized economy of Bangladesh substantially increases real output gains when it participates in the final stage of the liberalization, eliminating the tariffs imposed on non-LDC BIMSTEC economies in 2017, suggesting that it may be in Bangladesh's interest to bring forward this liberalization. The impact of the BIMSTEC region

liberalizing appears marginally negative on the excluded Japanese economy, at least in terms of real output.

**Figure 1: Projected changes in real GDP, Scenario 1 (%)**

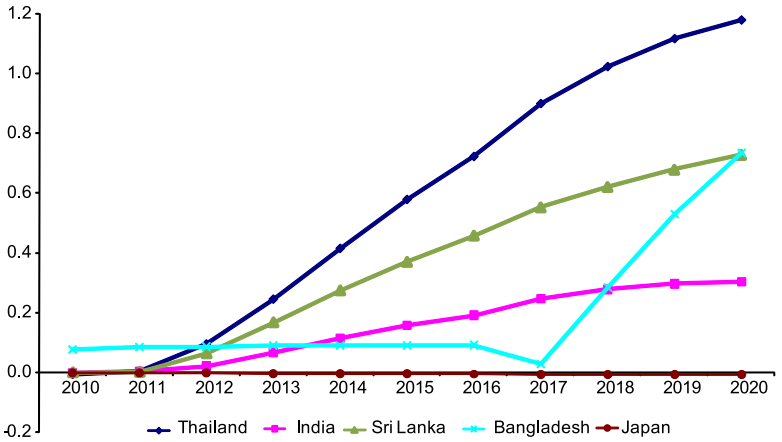
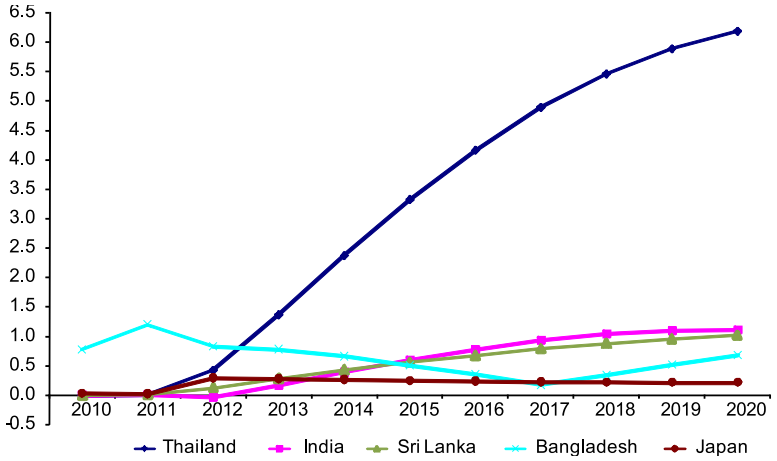



Figure 2 presents the projected changes in real GDP for each economy in the second scenario, when Japan is also included in the FTA. By 2020, Japan is now projected to experience a 0.2 percent increase in real output relative to the baseline. Keeping in mind the large size of the Japanese economy, this is a significant gain in absolute terms. The inclusion of Japan also brings further increases in real output for most BIMSTEC economies. Overall, GDP in the BIMSTEC region is projected to increase by 0.84 percent by 2020 – a gain of almost three times that projected in the first scenario. The most striking increase is for Thailand, where the increase in real GDP is projected to be 6.2 percent by 2020. India also is projected to benefit significantly, with the increase in real output now over 1.1 percent, compared with 0.3 percent projected for BIMSTEC-only liberalization. While not increasing quite so dramatically from the first scenario, Sri Lanka's annual gains in real output are projected to be of a similar magnitude to those projected for India by 2020. However, Bangladesh is projected to experience output growth that is 0.05 percent lower under this scenario than without Japan participating in the FTA.

**Figure 2: Projected changes in real GDP, Scenario 2 (%)**




What happens to these projected changes in real output when some sectors are categorized as 'sensitive' and not liberalized? The time path of these results is rather similar to Scenario 2. Table 5 summarizes the results for each of the three simulations in the final year, 2020. As can be seen, when the sensitive sectors are not liberalized, gains accruing to most of the economies are somewhat lower. Japan in particular loses much of the increase in real output that was projected in the second scenario. For BIMSTEC economies, the impacts are smaller, with India and Sri Lanka projected to lose less than 0.1 percent of their GDP increase and the impact on Thailand of including these sensitive sectors only very marginally negative. Interestingly, Bangladesh is projected to do better, in terms of real GDP at least, when sensitive sectors are permitted to remain

**Table 5: Projected changes in real GDP under each scenario, 2020 (%)**

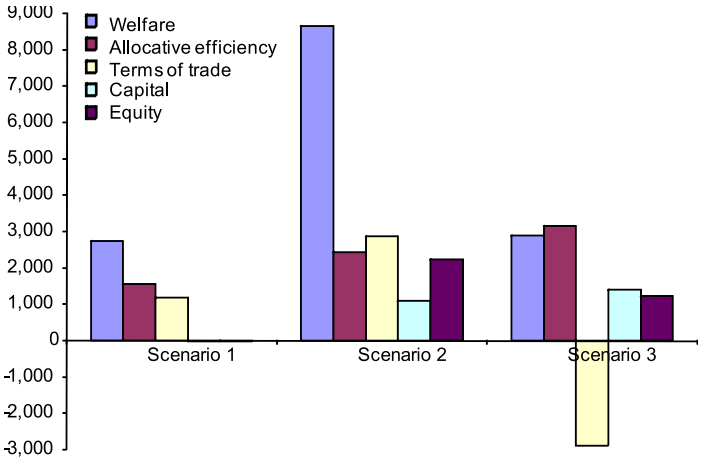
| | BIMSTEC | BIMSTEC-Japan | Sensitive products |
|---|---|---|---|
| Bangladesh | 0.74 | 0.68 | 0.79 |
| India | 0.30 | 1.12 | 1.04 |
| Sri Lanka | 0.73 | 1.02 | 0.98 |
| Thailand | 1.18 | 6.19 | 6.16 |
| Japan | -0.01 | 0.22 | 0.04 |

unliberalized. This suggests that special treatment for sensitive sectors may bring some benefit to this LDC region.

We now turn to the changes in overall economic welfare implied by the three alternative scenarios. Welfare in the GTAP model is measured by an equivalent variation (EV) in income (Hertel 1997). However, in the dynamic version of the model, welfare results are complicated by the lack of an intertemporal utility function and the path dependence of the welfare decomposition used in the comparative static version of GTAP (Ianchovichina and McDougall, 2001; Hertel and Huff, 2001). We therefore follow the approach of Walmsley and Hertel (2001) and Walmsley, Hertel and Ianchovichina (2006) in using a comparative static simulation which repeats the dynamic simulation but removes the impact of time-dependent variables. This enables determination of the difference in welfare at a given point in time, with and without implementation of the preferential trade agreements described above.

Figure 3 shows the projected change in welfare for the BIMSTEC region under each of the three scenarios modeled. It appears clear that the BIMSTEC region is likely to experience significant gains

**Figure 3: Decomposition of welfare results, BIMSTEC region, 2020 (US$m)**



from allowing Japan to participate in the FTA, with the overall gains to the region likely to more than treble from the BIMSTEC alone scenario, now reaching US$ 8.6 billion. The overall changes in welfare can be decomposed into four determinants: the allocative efficiency, terms of trade, capital and equity effects. As shown in the decomposition of welfare in Figure 3, there is an overall allocative efficiency improvement in all scenarios, contributing significantly to the overall welfare increases. This is an impact typically expected when tariffs are eliminated and resources are able to move into more efficient sectors. In the first two scenarios, the overall terms of trade impact on the region is positive, further accentuating the gains from allocative efficiency. This reflects an overall rise in export prices relative to import prices. However, when sensitive products are not liberalized in the third scenario, the terms of trade impact for the region is significantly negative, dampening down welfare gains. In the scenarios that include Japan joining BIMSTEC, there are also welfare gains from capital and equity effects that are not evident in the first scenario results, with the BIMSTEC-Japan scenario offering particularly significant gains in welfare due to changes in financial equity owned by the BIMSTEC region.[13]

When the overall BIMSTEC welfare gain is decomposed by individual economy, Table 6 suggests that the results are somewhat mixed. Thailand is projected to experience particularly significant welfare increases in all scenarios, particularly when Japan joins the BIMSTEC FTA and there are no sensitive products. The welfare gains for Thailand are due largely to allocative efficiency improvements, particularly in some of the manufactured good sectors. When Japan participates in the FTA, gains are also significant in the other processed foods sector. Thailand's positive terms of trade effect in the first two scenarios is due to increases in the regional export price, particularly other processed foods and rice when Japan is included in the second scenario liberalization.

Sri Lanka also is projected to experience welfare gains in all scenarios, particularly the second scenario, as was the case for Thailand. For Sri Lanka, terms of trade improvements are an important

**Table 6: Decomposition of welfare effects, 2020 (US$ million)**

| | Total Welfare | Contribution of: Allocative efficiency | Terms of trade | Capital | Equity |
|---|---|---|---|---|---|
| Scenario 1: BIMSTEC | | | | | |
| Bangladesh | -267 | 3 | -185 | -9 | -77 |
| India | 1,311 | 824 | 383 | -40 | 144 |
| Sri Lanka | 267 | 45 | 202 | -8 | 28 |
| Thailand | 1,295 | 614 | 525 | -8 | 164 |
| Total BIMSTEC | 2,738 | 1,549 | 1,187 | -3 | 5 |
| Japan | -501 | -109 | -301 | -6 | -86 |
| Scenario 2: BIMSTEC-Japan | | | | | |
| Bangladesh | -270 | -40 | -246 | -24 | 40 |
| India | -336 | 295 | -2,146 | 862 | 653 |
| Sri Lanka | 345 | 58 | 261 | -12 | 38 |
| Thailand | 9,035 | 2,093 | 4,945 | 217 | 1,780 |
| Total BIMSTEC | 8,645 | 2,439 | 2,859 | 1,103 | 2,244 |
| Japan | 26,160 | 25,052 | -393 | 192 | 1,303 |
| Scenario 3: Sensitive Products | | | | | |
| Bangladesh | -87 | 6 | -30 | -23 | -42 |
| India | -1,111 | 345 | -3,062 | 1,055 | 552 |
| Sri Lanka | 321 | 47 | 250 | -14 | 38 |
| Thailand | 3,754 | 2,713 | -171 | 337 | 875 |
| Total BIMSTEC | 2,892 | 3,160 | -2,892 | 1,393 | 1,230 |
| Japan | 7,804 | 1,082 | 3,961 | 530 | 2,232 |

contributor to the welfare improvement and are largely due to increased export prices for the other crops and the minerals sectors. For Bangladesh, the overall welfare impacts are negative in each scenario, much of which can be attributed to adverse terms of trade effects, particularly in the wearing apparel sector. However, in the sensitive goods scenario, this impact is much smaller. For India, these results suggest that in the first scenario, there are strong allocative efficiency gains, particularly in the other minerals and metal products sector and the coal-oil-gas-minerals sector. In the second scenario, these allocative efficiency gains are reduced and there is a significant deterioration in India's terms of trade. This leads to an overall small decline in total welfare with Japan joining BIMSTEC, an impact that is more pronounced in the third scenario, when sensitive products remain unliberalized. While there may be terms of trade losses, the allocative efficiency effects are expected to be positive, as is the overall impact on India's GDP (see Table 5).

In terms of Japan's welfare, Table 6 indicates that if a BIMSTEC FTA goes ahead without Japan, there is a small projected loss in welfare. However, if Japan participates in the FTA, relatively large welfare gains accrue to Japan. The welfare gains projected for Japan are largely due to improved allocative efficiency, particularly in the rice sector. These are significantly reduced if sensitive products (of which rice is one) remain unliberalized, leading to a significantly lower overall welfare impact in the third scenario.[14]

We now turn to how the BIMSTEC agreement, with and without Japan, is likely to impact on exports from each economy. Figure 4 indicates the projected percentage change in total exports from each country with implementation of the BIMSTEC FTA. The non-LDC regions of India, Sri Lanka and Thailand are projected to increase exports by between 2 and 2.5 percent. The significant impact on Bangladesh appears to be that exports take off in 2017 after opening its markets to the non-LDC BIMSTEC countries. For Bangladesh, a substantial proportion of the increase in the 2020 exports is due to the wearing apparel sector, with the other minerals and metal products sector also contributing significantly to the increase.

Figure 4 can be compared with Figure 5, where Japan is assumed to participate in the BIMSTEC-FTA. The impact on Japan's exports was slightly negative in the first scenario, however, when Japan participates in the FTA, total exports from Japan are expected to increase by almost 6 percent in 2020. In the longer-term, BIMSTEC countries also experience a further increase in exports when Japan

**Figure 4: Projected changes in the quantity of exports with BIMSTEC (%)**

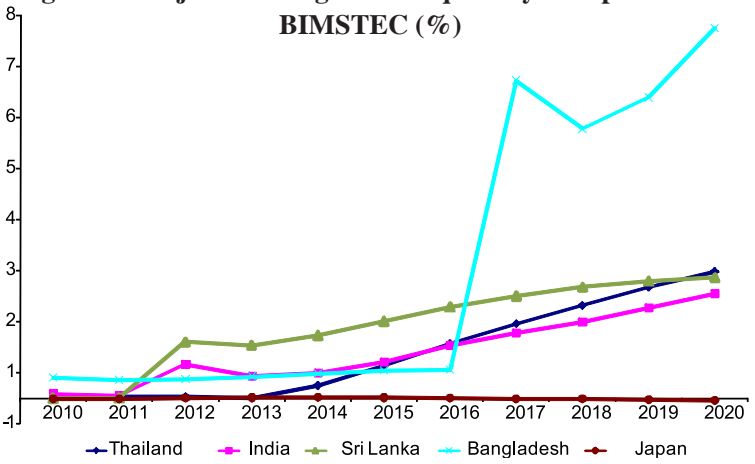
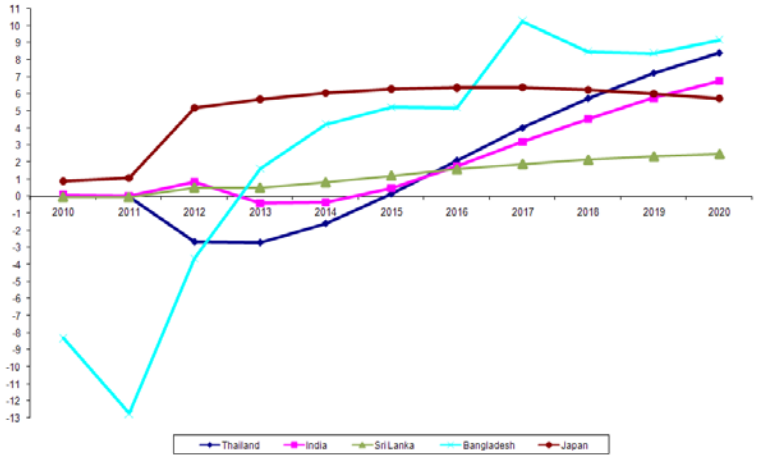



**Figure 5: Projected change in the quantity of exports with BIMSTEC-Japan (%)**



joins the FTA, however, there may be some shorter-term negative impacts on exports, particularly for Bangladesh and Thailand, as shown in Figure 5. This is likely to increase the global integration of these economies and enhance their dynamic competitiveness in ways not fully captured in the modelling undertaken here.

## 4. Tentative conclusions

Results presented in this paper suggest that if the BIMSTEC FTA is extended to include Japan, significant gains, including for output, welfare and exports, are likely for both the BIMSTEC region and Japan. However, while our tentative findings suggest large potential gains, there are a number of areas that could be further explored and analyzed in subsequent work, particularly as new databases become available. Careful attention will need to be given to the exact nature of the reform, including the timing, the use of sensitive product categories and special treatment for LDCs. Furthermore, it is important to keep in mind the dynamic environment of the global market place. For example, other preferential agreements may be implemented that will impact on the outcomes of the agreements discussed here (Strutt and Rae, 2007).

While there appear compelling overall benefits for the BIMSTEC region from allowing Japan to join their FTA, some difficulties are anticipated for individual economies. Since Japan is likely to experience large gains from joining a BIMSTEC FTA, there may be potential for Japan to help ensure that all BIMSTEC countries benefit from its inclusion in the agreement. CSIRD (2007) suggests that Japan could have an important role to play in strengthening the resource base and trade capacity of BIMSTEC countries. Most of the BIMSTEC member countries have benefited from Japanese ODA and FDI flows in the past (Devi, 2005), and Bhattacharya and Bhattacharyay (2007) suggest that Japan might need to offer additional assistance to poorer countries to compensate for asymmetries arising from trade liberalization. Our results appear to confirm that this may be useful in order for the large gains to be realized, while protecting vulnerable lower income countries which may have limited capacity to integrate easily into global markets and little resilience to cope with adverse shocks (Strutt and Lim, 2005).

## Endnotes

1 http://www.bimstec.org

2 The edited volume by Pupphavesa (2008) discusses a range of aspects of improved economic cooperation between BIMSTEC and Japan, including trade.

3 See www.gtap.agecon.purdue.edu for detailed information.

4 The model is solved using GEMPACK software (Harrison and Pearson 1996), using the RunGDYN interface.

5 Future versions of the GTAP database will offer further disaggregation of these regions.

6 Given the limited insights that will be generated specifically for Myanmar, we will not report results for the composite region. However the composite region will be included in overall BIMSTEC results.

7 Updated and additional macroeconomic projections were generously provided by Terrie Walmsley.

8 Tariffs between Australia and New Zealand are also eliminated to reflect the CER agreement in place.

9 www.gtap.agecon.purdue.edu/databases/v6/V6_dohascen.asp

10 Includes the Myanmar-composite region.

11 Of the BIMSTEC countries we model, Thailand, India and Sri Lanka are considered to be non-LDCs, with Bangladesh and Myanmar receiving the LDC concessions in terms of timing.

12 Some of the country lists may be found at http://commerce.nic.in/bimstec/bimstec_june.htm.

13 The two components of this are the contribution of changes in capital used in the region and the net contribution due to foreign ownership in and by the region.

14 This result may need to be viewed with some caution since substitution of imports for domestic rice may be limited, given strong preferences in Japan for locally produced rice.

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