

PHASING OUT THE MULTI-FIBRE ARRANGEMENT: IMPLICATIONS FOR INDIA*

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1. INTRODUCTION

Textile industry has played a vital role in India's economy in terms of employment generation, strengthening the rural base and earning foreign exchange through exports. This industry provides direct and indirect employment to 26 million people (Gokhale and Katti, 1995). Textiles and readymade garments have strong backward linkage effects (Chadha and Pratap, 1999). Exports of textile yarn, fabrics and readymade garments (excluding handmade carpets), valued at \$8.1 billion, accounted for about 23.8 per cent of India's total goods export earnings during 1997-98.

There is a great potential of growth and development in India's textile and apparel sectors, based on their relative comparative advantage vis-à-vis other sectors as well as countries. This fact has been brought out in a recent study on the potential impact of trade and domestic policy reforms in India undertaken during the 1990s.¹ The study establishes that trade policy reforms undertaken on a less domestically distorted Indian economy have a much higher potential to increase welfare and efficiency of the economy than if the similar trade policy reforms are undertaken in a domestically distorted economy. In fact, the clothing sector turns out to be the highest gainer in terms of output, employment and exports.

However, the growth potential of the textile and apparel sectors in India has been severely restricted through domestic regulations and international factors including the Multi-Fibre Arrangement (MFA). The textile and apparel sectors in India have traditionally been subject to a number of government regulations through reserving parts of each sector for small-scale industry and maintaining employment even at the expense of sharp decline in productivity. The cotton spinning and weaving activities have also been protected against competition from man-made fibres through restrictions against their imports. The low efficiency of the processing sectors motivates the government to fix quotas on export of cotton, which further leads to lower returns to cotton growers. Such distortions lead to loss of competitiveness of

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the clothing industry, perhaps the sector, which has the maximum growth and employment potential in a distortion free economy. Apart from having been subjected to a plethora of domestic regulations and restrictions, the textile and apparel sectors of India's economy have also faced disabilities imposed by regulations imposed on world trade in textiles and readymade garments through MFA since 1974. Under this Arrangement, the developed countries imposed quotas on exports of yarn, textiles and apparel from developing countries. The MFA has turned out to be an instrument of forced consensus designed to manage textile and apparel trade to the advantage of countries that were fast losing international competitiveness in these lines of production. The developing countries are supposed to have a quota administration mechanism, which would regulate the exports of yarn, textiles and apparel to the MFA listed developed countries.

One of the major accomplishments of the Uruguay Round Agreement was the Agreement on Textiles and Clothing (ATC), which stipulates that the MFA to be gradually phased out over a ten-year period commencing 1995. The World Trade Organisation (WTO) stipulates that the MFA shall be phased out by the end of 2004 thus integrating trade in textiles and clothing into the General Agreement on Tariffs and Trade (GATT) rules.

An important question arises here, viz. would India gain or lose from the demise of MFA? Dismantling of quota regime provides a great opportunity for India to exploit the vast unutilised potential of its textiles and clothing sectors. However, there is a threat insofar as assured markets would also get lost along with dismantling of the quota regime. The country would need to take timely action to relax various policy constraints to increase the competitiveness of the domestic industries. India and other South Asian countries are at the threshold of a long-term dynamic growth path, which was experienced by Indonesia, Malaysia and Thailand during the period of two decades, viz. 1975 to 1995, based on rapid growth in their respective textiles and clothing sectors (Chadha, 1998).

The present paper is an attempt to analyse the potential gains from abolition of MFA for developing countries, particularly India. We use a 23-sector multi-country computable general equilibrium (CGE) NCAER-UM Model of World Trade, Production and Employment (Brown *et al*, 1996a,b and Chadha *et al*, 1998a). The experiments are conducted through simulating abolition of tariffs and non-tariff barriers on bilateral trade of textiles and clothing between the developing and the developed countries. Section 2 deals with origin and economic impact of the MFA on welfare and efficiency of the participating countries, both developing and developed. An overview of the NCAER-UM CGE Model along with proposed simulations and the database used is provided in section 3. Section 4 outlines the

results of policy simulations. Conclusions and implications for policy, specifically for India, are discussed in Section 5.

2. ORIGIN AND ECONOMICS OF MULTI-FIBRE ARRANGEMENT

2.1 ORIGIN OF MFA

The quantitative restrictions on textile imports from developing countries were first introduced in 1930s, mainly directed against the increasingly competitive Japanese cotton textile industry. It was Japan's textile exports to the industrial countries, which spearheaded its export-led industrialisation after the Second World War. The industrial countries came under pressure for protecting their textiles and apparel sectors not only because of international competition but also mainly due to shrinking domestic industry as a result of sluggish domestic demand (Keesing and Wolf, 1980).

International trade in agricultural products and in textiles and clothing was gradually taken out of reach of GATT-1947 disciplines starting in 1950s. The textiles and clothing sectors in the developed countries were increasingly coming under pressure from relatively cheap imports of these products from the developing countries. The developing countries had gradually been acquiring comparative advantage in these sectors, which were high on labour intensity but relatively low on the required levels of skill, scale, technology and capital.² The developed countries aimed at protecting employment of skilled and semi-skilled workers in textiles and clothing sectors, which, as of 1960s, accounted for a major share of employment in the manufacturing sectors of many OECD countries (Hoekman and Kostecki, 1995). Instead of permitting reallocation of resources in line with shifting comparative advantage, the developed countries chose to limit imports of textile and clothing products. Despite such protection, total employment in these sectors along with the real income of the low-skilled workers declined steadily. Low-income groups were especially hit hard due to rise in prices of lower-quality garments as the result of controlled imports thereof. Estimates for Canada revealed that the relative burden of protection is four times higher for low-income consumers than for higher income groups (UNCTAD, 1994).

Despite Japan's "voluntary" export restraints, world trade in cotton textiles got restricted through the Short-Term Arrangement (STA) on Cotton Textiles under the auspices of the GATT Dillon Round (1961) followed by a Long-Term (LTA) Arrangement in 1962. However, textile exports of developing countries to industrial countries continued to expand during the 1960s due to strengthened competitiveness of the developing countries arising from technological upgradation as well as emergence of synthetic fibres (Yang et al, 1997).

Restrictions on Japanese cotton textile exports had also led to rapid growth of exports from developing Asian countries, namely, Hong Kong, Korea and Taiwan (Keesing and Wolf, 1980).

The renewed threat of competition from developing countries was followed by four successive agreements on Multi-Fibre Arrangements commencing with MFA-I in 1974. MFA-IV was signed in 1986 with extension up to 1991 when it was extended further till 1994.³ MFA-IV had forty-five signatories including eight importers (developed countries) and thirty-seven exporters (developing countries).⁴ The scope of MFA was progressively broadened to include all types of fibres.⁵

2.2 ECONOMICS OF MFA

The Multi-Fibre Arrangement provided a framework under which developed countries imposed quotas on export of yarn, textiles and apparel from developing countries. The MFA runs counter to the spirit of the multilateral trading system, which promotes ban on quantitative restrictions, and prohibition of discrimination between suppliers (Martin, 1996). The MFA framework provides for imposition of import quotas by developed countries on the exports of textile and apparel products from developing countries.⁶ The quotas are usually negotiated bilaterally under the threat of unilateral restraints by the importer.⁷ These quotas are specific to particular product categories and are defined by fibre and function.⁸ Thus arises discrimination not only against specific fibres and products but also among exporting countries (Martin, 1996). The governments of the exporting countries adopt voluntary export restraints (VERs) and allocate export quotas to individual exporting firms on the basis of certain criteria like past performance and/or current exports of unrestricted products. The binding quotas lead to rents being associated with quota rights, which command varying prices in different countries depending upon the severity of restrictions.⁹ Many countries allow quota rights to be traded among exporters. An exporting firm either has to buy a quota or forego the sale of quota right that it might hold. The quota rent thus adds to the cost of export, which is analogous to the cost imposed by an export tax.

The MFA imposes heavy costs of protection on textiles and apparel importing developed countries as the quotas induce increase in costs of the suppliers and hence in prices at which they are willing to supply textiles and clothing. The importing countries also forgo conventional benefits of import protection, which potentially arise through import duty revenues or quota rents, unless there is some rent sharing with the exporting firms (Martin, 1996). Though exporting countries benefit from higher prices in the restricted markets, they

lose from lower prices in the unrestricted markets. Both importing and exporting countries suffer a loss of efficiency as the former do not benefit from the flexibility of efficient sourcing of imports across supplying countries while the exporting countries have to scale back production in sectors for which they have comparative advantage (Elbehri et al, 1998).

One of the most important accomplishments of the Uruguay Round was the Agreement on Textiles and Clothing (ATC), which would bring MFA-restricted goods under GATT disciplines.¹⁰ Under this liberalisation process, the MFA quota-regime would be gradually phased out during a 10-year transition period commencing from 1995. The import tariffs are also being reduced on both textiles and clothing and on a wide range of other goods. However, the rates of tariff reduction on textiles are considerable lower compared to most other goods. The MFA abolition offers great opportunities for exporting countries, particularly in South and Southeast Asia, to expand textile and clothing exports and stimulate demand for fibres (Elbehri *et al.*, 1998). The expansion of these labour-intensive sectors is likely to have a positive impact on employment in exporting countries. Tightly restricted exporters like India, Pakistan and Sri Lanka are more likely to be net beneficiaries under the ATC. The less restricted exporters (Bangladesh) or mature markets like South Korea, Taiwan and Hong Kong, which have large quotas relative to their export levels (Yang *et al.*, 1997; and Martin 1996). India may also gain more than some other textile and apparel exporters from MFA elimination since it has been shown that these quotas tend to discriminate more strongly against relatively labour-intensive component of MFA controlled goods, viz. cotton-based fibres, which dominate India's in India's exports (Martin, 1996). Since India has a natural comparative advantage in cotton and cotton-based fibres, abolition of the MFA has an implicit potential to benefit India's cotton industry as well as cotton based textiles and clothing sectors (Elbehri *et al.*, 1998).

The present paper is an attempt to estimate potential gains from abolition of MFA for developing countries, particularly India. We use a 23-sector multi-country computable general equilibrium (CGE) NCAER-UM Model of World Trade, Production and Employment (Chadha *et al*, 1998a). The experiments are conducted through simulating abolition of tariffs and non-tariff barriers on bilateral trade of textiles and clothing between the developing and the developed countries.

3. OVERVIEW OF THE NCAER-UM MODEL

The CGE model that we have developed is distinctly different from existing models of the Indian economy. Our model is a multi-country, multi-sectoral CGE model. It incorporates

some of the features of the new trade theory, viz. increasing returns to scale, monopolistic competition and product heterogeneity. While it is patterned after the structure used in the Michigan world trade CGE model developed by Brown, Deardorff, and Stern (BDS) and applied in a variety of their papers, it contains a number of special features that are unique to the structure of the Indian economy.¹¹ Below, we describe briefly the distinguishing features of the present model.

3.1 SECTORS AND MARKET STRUCTURE

The model consists of 7 major trading partners of India and 23 tradable sectors. Our model incorporates the following countries/regions: India (IND); Rest-of-South Asia (RSA); ASEAN (ASN); Newly Industrialising Economies (NIE); USA (USA); Japan (JPN); and European Union (EUN).

In our regional structure, RSA includes of Bangladesh, Nepal, Pakistan and Sri Lanka. ASN includes Indonesia, Malaysia, the Philippines and Thailand. NIE includes Hong Kong, South Korea, Singapore and Taiwan. EUN includes UK, Germany, Denmark, Sweden, Finland and rest-of-European Union. All the remaining countries of the world are consigned to a residual rest-of-world to close the model.

The sectoral coverage in each country/region includes five agricultural sectors, fifteen manufacturing sectors, one mining sector, and 2 service sectors. All sectors are modelled as tradable. Table 1 shows the sectoral breakdown together with specification of the market structure for different sectors.

3.2 EXPENDITURE

Consumers and producers are assumed to use a two-stage procedure to allocate expenditure across differentiated products. In the first stage, expenditure is allocated across goods without regard to the country of origin or the producing firm. At this stage, the utility function is taken to be Cobb-Douglas and the production function requires intermediate inputs in fixed proportion. In the second stage, expenditure on monopolistically competitive goods is allocated across the competing varieties. However, in the case of perfectly competitive goods, since individual firm supply is indeterminate, expenditure on each good is allocated over the industry as a whole. The aggregation function in the second stage is a Constant Elasticity of Substitution (CES) function.

3.3 PRODUCTION

The production function is separated into two stages. In the first stage, intermediate input and primary composite of capital and labor are used in fixed proportion to output.¹² In the second stage, capital and labor are combined through a CES function to form the primary composite. In the monopolistically competitive sectors, additional fixed inputs of capital and labor are required. It is assumed that fixed capital and fixed labor are used in the same proportion as variable capital and variable labor so that production functions are homothetic.

To determine prices, perfectly competitive firms set price equal to marginal cost, while monopolistically competitive firms maximise profits by setting price as an optimal mark-up over marginal cost. The numbers of firms in sectors under monopolistic competition are determined by the condition that there are zero profits.

3.4 CAPITAL AND LABOUR MARKETS

Capital and labour are assumed to be perfectly mobile across sectors within each country. Returns to capital and labour are determined such as to equate factor demand to an exogenous supply of each factor. The aggregate supplies of labour and capital in each country are assumed to remain fixed so as to abstract from macroeconomic considerations involving, for example, determination of investment, since our focus is on the intersectoral allocation of resources.

3.5 WORLD MARKET, POLICY INPUTS AND RENT / REVENUES

World market determines equilibrium prices such that all markets clear. Total demand for each firm or sector's product must equal total supply of that product. It is also assumed that trade remains balanced for each country/region, or more accurately that initial trade imbalance remains constant, as trade barriers are changed. This assumption reflects the reality of mostly flexible exchange rate among the countries involved. Moreover, this is an appropriate way of abstracting from the macroeconomic forces and policies that are the main determinants of trade imbalance.

We have attempted to incorporate the following policy inputs in our model that were applicable to the bilateral trade of the various regions with respect to one another:

- i) nominal import tariff rates
- ii) non-tariff barriers (NTBs) on imports

iii) tariffs and NTBs on exports.

In our model, NTBs on imports are incorporated by endogenously solving for the ad valorem tariff-equivalent rate that would hold imports within each product category covered by NTBs at a pre-determined level. An ad valorem tariff variable in each product category is then an average of this NTB tariff-equivalent rate and the nominal tariff rate, using the NTB coverage ratio to weight the NTB tariff equivalent. It is assumed that the revenues from import tariffs or rents from NTBs on imports are redistributed to consumers in the tariff-levying country and are spent like any other income. When tariffs are reduced, this means that income available to purchase imports falls along with their prices, and there is no bias towards expanding or contracting demand.

By contrast, our model does not capture separately export taxes and NTBs on exports. Instead, we have modeled the barriers in aggregate by the variable export tax equivalents. In our model, this comprises of ordinary export taxes, ad valorem tariff-equivalent rate of MFA quota premium, ad valorem tariff-equivalent rate of voluntary export restraints, export subsidy equivalent of price undertakings and ordinary export subsidy rate. We assume that the revenues from export tariffs or rent from NTBs on exports are redistributed to the consumers in the foreign suppliers and are spent like any other income.

3.6 MODEL CLOSURE AND IMPLEMENTATION

It is assumed in this model that aggregate expenditure varies endogenously to hold aggregate employment constant. Such a closure may be thought of as analogous to the Johansen closure rule (Deardorff and Stern, 1990). The Johansen closure rule consists of keeping the requirement of full employment while dropping the consumption function. This means that consumption can be thought of as adjusting endogenously to ensure full employment. However, in the present model, we do not distinguish consumption from other forms of final demand. That is, we assume that expenditure adjusts to maintain full employment, which may be thought as analogous to the Johansen closure rule.

Our model is solved using GEMPACK (Harrison and Pearson, 1996). When policy changes are introduced into the model, the method of solution yields percentage changes in sectoral employment and certain other variables of interest for India. Multiplying the percentage changes by actual (1995) levels given in the data base yields the absolute changes, positive or negative, that might result from India's unilateral trade and domestic policy reforms.

3.7 THE DATA

Expectedly, the data needs of a model like ours are immense. Apart from various share parameters, our model requires various types of elasticity measures. Like any other CGE models, most of our data comes from published sources. Below, we give a brief overview of the database of this present model.

The main source data of this model is "The GTAP 4 Data Base" of the Center for Global Trade Analysis (McDougall, Elbehri and Truong, 1998). Since the above database is for the year 1994, we have chosen 1994 as the base year for our model. We have extracted the following data, aggregated to our sectors and regions, from the above source:

- (i) bilateral trade flows between eight regions, decomposed into 23 sectors;
- (ii) inter-output tables for the seven regions excluding ROW;
- (iii) components of final demand along with sectoral contributions for the seven regions (excluding ROW);
- (iv) gross value of output and value added at the sectoral level for the seven regions excluding ROW;
- (v) bilateral import tariff by sectors between seven regions;
- (vi) elasticity of substitution;
- (vii) bilateral export tariff equivalent between seven regions, decomposed into 23 sectors.

The monopolistic market structure in 18 out of 23 sectors of our model imposes additional data requirement of number of firms at these sectoral levels for each of the seven regions. The data has been drawn from “International Yearbook of Industrial statistics, 1998” of the United Nations. We have culled data of 31 countries by sectors from the above source to arrive at the number of firms by sectors for each of the seven regions of our model.¹³

We also need estimates of sectoral employment for the member countries/regions of our model. Data on this account have been drawn from the following two sources:

- (a) International Yearbook of Industrial Statistics (UNIDO, 1995)
- (b) World Development Report (World Bank, 1997).

The data of 38 countries at 3 digit ISIC classification UNIDO (1995) has been aggregated according to our sectoral / regional aggregation scheme to arrive at the estimates of workers employed in manufactured goods sectors. The WDR (1997) has been used to obtain data for the other sectors.¹⁴

3.8 SCENARIOS

We assume here that all textile and clothing categories are restricted by MFA, even though, all textile and clothing categories are not covered by binding MFA import quotas (for estimates of these coverage ratios see Hamilton, 1990). We begin with experiment of MFA phase-out such that the developed countries (USA and EUN) relax their respective NTBs on imports of textiles and clothing from developing countries (IND, ASA, ASN and NIE) by 50 per cent with the developing countries' export tax equivalents being reduced to zero (scenario `A').<sup>15</sup> Beyond this conventional MFA phase-out experiment, we now move on to introduce further liberalisation of world trade in textiles and clothing. Under scenario `B', we assume that over and above scenario `A', the developed countries also reduce their import tariffs against imports of textiles and clothing from developing countries by 15 per cent. Under scenario `C', the world trade in textiles and clothing is liberalised further, over and above scenario `B' with developing countries reducing their tariffs on imports of textiles and clothing by 10 per cent on most favoured nation (MFN) basis. Finally, under scenario `D', developing countries relax their NTBs on imports of textiles and clothing by 50 per cent, over and above scenario `C' assumptions. In scenarios `E' and `F', we analyse the impact of unilateral import liberalisation by Japan alone on world trade in textiles and clothing. This has been done because we did not introduce any liberalisation shocks to the imports of textiles and clothing into the Japanese economy.

SCENARIOS / EXPERIMENTS

- A. *USA and EUN relax their import NTBs on textiles and wearing apparel by 50 per cent on imports originating from IND, RSA, ASN and NIE. Export tax equivalents on exports of textiles and clothing have been reduced by 100 per cent by IND, RSA, ASN and NIE on exports of textiles and wearing apparel to USA and EUN.*
- B. *Experiment `A' plus 15 per cent reduction of import tariffs on textiles and wearing apparel by USA and EUN on imports from IND, RSA, ASN and NIE.*
- C. *Experiment `B' plus 10 per cent reduction in import tariffs on textiles and wearing apparel by IND, RSA, ASN and NIE on MFN basis.*
- D. *Experiment `C' plus relaxation of import NTBs by 50 per cent on imports of textiles and wearing apparel by IND, RSA, ASN and NIE on MFN basis.*
- E. *Japan relaxes import NTBs on textiles and wearing apparel by 50 per cent on MFN basis.*
- F. *Experiment `E' plus 15 per cent reduction in import tariffs on textiles and wearing apparel by Japan on MFN basis.*

4. RESULTS

Tables A to F present percentage changes in aggregate output, exports, imports, equivalent variation, scale effect, wage rate and return to capital for the six experiments performed for each of the six scenarios under consideration. It is expected that trade liberalisation in textiles and apparel sectors, resulting from MFA phase-out, will stimulate production of these labor-intensive sectors in India (IND), rest-of-South Asia (RSA), ASEAN (ASN) and Newly Industrialising Economies (NIE). Productive resources will then be allocated more efficiently as compared to the pre-liberalisation position, as these developing Asian countries, particularly India and RSA, specialise in the production of these sectors. South Asia has natural comparative advantage in these sectors. There may of course be transitional costs due to the intersectoral movement of factors of production, but we do not take them into account.

The gains from the liberalisation scenarios under study should, however, be interpreted in the light of the assumptions of our modelling structure. We have abstracted from the effects of macroeconomic forces and policies, and we are not able to capture the effects of dynamic changes in efficiency and economic growth. We have also not analysed the effects of possible changes in inflows of foreign direct investment. Thus the reported gains are the result of MFA phase-out and reductions in tariffs and NTBs.

4.1 ECONOMIC WELFARE

Economic welfare measured in terms of equivalent variation, increases for the developing Asian countries with the phase-out of MFA. It may be observed from Table A that the maximum welfare increase is observed in South Asia other than India. Whereas, welfare enhances by 2.6 per cent in RSA, India gains in welfare by 0.7 per cent. ASN and NIE regions also gain in welfare, but by a smaller percentage increase of 0.1 per cent each. Within the developed regions, USA gains in welfare by 0.2 per cent whereas the corresponding figure for EUN is 0.1 per cent. Japan loses in welfare but only marginally. The similar story is observed when the world trade in textiles and clothing gets further liberalised (see Tables B, D and E). India and rest-of-South Asia gain more than ASEAN and NIEs as the developed countries lower their tariffs on imports of textiles and clothing (Table B). Gains increase further when developing Asian countries / regions lower their tariffs on textiles and clothing by 10 per cent on MFN basis (Table C) and even further when these countries relax their NTBs on textiles and clothing by 50 per cent (Table D). It may be observed from Tables E and F that Japan gains through unilateral liberalisation.

4.2 OUTPUT OF TEXTILES AND CLOTHING SECTORS

It may be observed from Tables A to D that ASN region turns out to be a major gainer, in percentage terms, in the output of textiles (14.5 per cent), followed by NIE (8.5 per cent), RSA (7.5 per cent) and IND (5 per cent). In the case of output of wearing apparel, RSA is the most significant gainer (27 per cent), followed by NIE and IND (23 per cent each) and ASN (19.5 per cent). The output levels of textiles and clothing sectors decline in USA, EUN and JPN, with relatively greater decline in the output of clothing than that of textiles. In the case of USA, output of textiles sector declines by 2.5 per cent while that of clothing is down by 6 per cent. The corresponding declines in the case of EUN are 2 and 3 per cent, respectively. Japan also loses in the output of these two sectors in the context of less distorted world trade in textiles and clothing. There are corresponding shifts in allocation of factors of production (capital and labour) towards these two sectors. This clearly establishes the fact that the resources in these regions of Asia have not been allocated efficiently due to distortions in the world trade of textiles and wearing apparel.

4.3 EXPORTS OF TEXTILES AND CLOTHING

India turns out to be a major proportional gainer in exports of both textiles as well as clothing sectors. Whereas exports of textiles increase by 26 per cent (see Tables A to D), those of wearing apparel increase by 42 per cent, thus indicating the natural comparative advantage of the country in these two sectors. High growth in India's exports of textiles sector is followed by ASN (19.5 per cent), RSA (17 per cent) and NIE (8 per cent). The corresponding exports grow only marginally for USA, EUN and JPN. Apart from India, other major gaining sectors in exports of clothing are NIE (36 per cent) and RSA and ASN (each 33 per cent). USA, EUN and JPN lose in exports of clothing sector.

4.4 IMPORTS OF TEXTILES AND CLOTHING

USA and Japan witness major proportional growth in imports of textiles and clothing sectors as a result of MFA phase-out (Table A). The gains remain nearly similar in experiments B through D (Tables B, C and D). Whereas imports of textiles by both USA and EUN increase by 13 per cent each, imports of wearing apparel increase by 20 per cent in USA and only by 11 per cent in EUN. In the case of developing Asian regions, imports of textiles witness high proportional growth as a result of MFA phase-out (Table A). The growth rates become even higher when developing Asian regions liberalise their import

regimes after MFA phase-out (Tables C and D). In the case of India, imports of wearing apparel decline as a result of MFA phase-out, but there is a high proportional gain when developing Asian regions undertake import liberalisation steps (Tables C and D). However, imports of wearing apparel decline in the cases of ASN and NIE even under scenarios C and D.

4.5 GAINS IN RETURNS TO FACTORS OF PRODUCTION

The gains to the most of the countries are also reflected in positive real returns to both factors of production. RSA turns out to be the major gainers in terms of returns to factors of production. Real wage rate increases by 0.5 per cent and real return to capital increases by 1.2 per cent in RSA (Tables A to D). Real wage increases by 0.4 per cent in ASN followed by IND and NIE, each 0.3 per cent. There is a marginal increase in real wage rate in USA and EUN. Real return to capital increases by 0.1 per cent in IND and registers marginal increase in ASN. However, there is a decline of 0.1 per cent in real return to capital in NIE. Japan undergoes marginal decline in real wage rate return to capital. This is due to Japan not playing any role in MFA phase-out (since it does not impose MFA restrictions on developing countries) or in liberalisation of import regime (experiments C and D). However, real returns to both labour and capital become positive when Japan undertakes unilateral import liberalisation under scenario 'F' (Table F).

4.6 SCALE EFFECTS

The scale effect is measured as output per firm. Under the assumption of free entry and exit, as the total output in a sector expands in country, new firms may join in and vice versa. The positive scale effect refers to an increase in output per firm while a negative scale effect refers to a decline in output per firm. Positive scale effect may be considered as an indicator of enhanced scale and reduced costs in the situation of monopolistic competition in the relevant sector. It may be observed that the scale effect is positive for all the Asian developing regions in experiments A to D (Tables A to D). RSA, ASN and NIE regions experience higher scale effects in clothing than in textiles. India gains evenly in scale effect in both these sectors. Whereas EUN experiences positive scale effects in both the sectors, the USA has a positive scale effect for clothing but negative effect for textiles. Japan experiences positive scale effect under unilateral liberalisation (Table F).

5. SUMMARY AND CONCLUSIONS

This study is part of an ongoing exercise of integrating India into multi-country Michigan Model using GTAP 4 database. We have taken a simplistic view of MFA phase-out by assuming that the developed regions in our model, namely USA and EUN, relax their respective NTBs on imports of textiles and clothing from developing regions, namely IND, ASA, ASN and NIE, by 50 per cent. Simultaneously, the developing regions' export tax equivalents on textiles and wearing apparel are reduced to zero. Beyond this conventional MFA phase-out experiment, we then move to introduce further liberalisation of world trade in textiles and clothing. We then assume that over and above the conventional MFA phase-out, the developed countries reduce their import tariffs against imports of textiles and clothing from developing countries by 15 per cent. Finally, we superimpose liberalisation of import regimes of developing Asian regions of our model over and above the already liberalised scenario. We assume that the developing regions reduce their import tariffs on imports of textiles and clothing by 10 per cent on MFA basis and that they also relax their NTBs on these sectors by 50 per cent.

Reduced distortions in world trade of textiles and wearing apparel leads to more efficient allocation of resources across the sectors of production in various participating regions. The resulting scale effects clearly show that textiles and clothing sectors become relatively more efficient as a result of reduced trade distortions in these sectors. Whereas output levels of textiles and clothing sectors increase in the developing regions, these decline in the developed regions. The developing regions export more of textiles and clothing products with corresponding increase originating from the developed regions. Economic welfare improves in all the participating regions, both developing and developed. Real returns to labour and capital also improve in all the participating regions except for the case of capital in NIE region. However, in order to absorb the potential gains, the developing regions need to undertake domestic reforms in fibres, yarn, textiles and clothing so as to minimise domestic distortions in these sectors. The analysis of the realisation of such potential gains will be the agenda of our ongoing work.

REFERENCES

- Brown, Drusilla K., Alan V. Deardorff and Robert M. Stern. 1995. "Expanding NAFTA: Economic Effects of Accession of Chile and Other Major South American Nations," *North American Journal of Economics and Finance* 6:149-70.
- Brown, Drusilla K., Alan V. Deardorff, Simeon Djankov, and Robert M. Stern. 1996a. "An Economic Assessment of the Integration of Czechoslovakia, Hungary, and Poland into the European Union," in Stanley Black (ed.) *Europe's Economy Looks East*. New York: Cambridge University Press.
- Brown, Drusilla K., Alan V. Deardorff and Robert M. Stern. 1996b. "Computational Analysis of the Economic Effects of an East Asian Preferential Trading Bloc", *Journal of the Japanese and International Economies*, 10: 37-70.
- Chadha, Rajesh. 1998. "India's Export Performance: A Comparison with East Asian Countries" Agarwal, Manmohan et al (eds.), *Indian Economy in Transition: Environmental and Development Issues*, Har-Anand, New Delhi,
- Chadha, Rajesh, Sanjib Pohit, Alan V. Deardorff and Robert M. Stern. 1998a. Report submitted to USAID, New Delhi.
- Chadha, Rajesh, Sanjib Pohit, Alan V. Deardorff and Robert M. Stern. 1998b. *The Impact of Trade and Domestic Policy Reforms in India: A CGE Modeling Approach*, The University of Michigan Press, Ann Arbor.
- Chadha, Rajesh, Sanjib Pohit, Alan V. Deardorff and Robert M. Stern. 1998c. "Analysis of India's Policy Reforms," *World Economy*, March 1998.
- Chadha, Rajesh and Davinder Pratap 1999. *Linkage Structure of Indian Manufacturing Sectors*, Mimeo, NCAER, New Delhi.
- Deardorff, Alan V. And Robert M. Stern. 1990. *Computational Analysis of Global Trading Arrangement*, The University of Michigan Press, Ann Arbor.
- Elbehri, Aziz, Thomas Hertel and Will Martin. 1998. "Estimating the Impact of Trade Reforms on the Indian Cotton and Textile Sectors: A General Equilibrium Approach", Mimeo., Department of Agricultural Economics, Purdue University.
- Francois, Joseph F. And Kenneth A. Reinert (eds.). 1997. *Applied Methods for Trade Policy Analysis: A Handbook*, Cambridge University Press, Cambridge and New York.
- Gokhale, Chandan and Vijaya Katti (1995). *Globalising Indian Textiles: Threats and Opportunities*, Tecoya Disseminators, Bombay.
- Hamilton, Carl B (ed.). 1990. "Textiles Trade and Developing Countries", The World Bank.
- Harrison, W. Jill and K. R. Pearson. 1996. "Computing Solutions for Large General Equilibrium Models Using GEMPACK," *Computational Economics*, 9: 83-87.

Hertel, Thomas W. (ed.). 1997. *Global Trade Analysis: Modelling and Applications*, Cambridge University Press, Cambridge.

Hoekman, Bernard and Michel Kostecki. 1995. *The Political Economy of the World Trading System: From GATT to WTO*, Oxford University Press, Oxford.

Kathuria, Sanjay and Anjali Bhardwaj. 1998. "Export Quotas and Policy Constraints in the Indian Textile and Garment Industries", *Policy Research Working paper 2012*, Trade, Development Research Group, World Bank.

Keesing, B.K. and M. Wolf.. 1980. "Textile Quotas Against Developing Countries," Thames Essay No. 23, *Trade Policy Research Centre*, London.

Krishna, K.R. Erzan and L. Tan. 1994. "Rent Sharing in the Multi-Fibre Arrangement: Theory and Evidence from US Apparel Imports from Hong Kong", *Review of International Economics* 2(1).

Martin, Will.1996. "The Abolition of the Multi-Fibre Arrangement and Its Implications for Fiber Markets", paper presented at the Conference on *Uruguay Round Agreement: Implications for South Asian Agriculture*, Kathmandu, April 22-24, 1996.

Martin, Will and L. Alan Winters (eds.). 1996. *The Uruguay Round and Developing Countries*, Cambridge University Press, New York.

UNCTAD. 1994. *The Outcome of the Uruguay Round - Supporting Papers to the Trade and Development Report*, Geneva.

UNCTAD. 1996. *Trade and Development Report*, Geneva.

Yang, Yongzheng, Will Martin and Koji Yanagishima. 1997. "Evaluating the Benefits of Abolishing MFA in the Uruguay Round Package" in Thomas W. Hertel (ed.), *Global Trade Analysis: Modelling and Applications*, Cambridge University Press, Cambridge.

Table 1: Sectoral Breakdown of Multi-Country Model : Some Key Economic Indicators for India, 1995							
SN	SECTOR DESCRIPTION	Sector Code	Market Structure	US \$ Millions			Labor Share %
				Output	Exports	Imports	
1	Foodgrains	FGR	PC	7509	212	8	18.83
2	Other Foodcrops	OCR	PC	13916	1930	874	13.63
3	Oilseeds	OLS	PC	10304	154	20	8.34
4	Plant Based Fibers	PBF	PC	4779	44	189	3.85
5	Rest of Agriculture	ROA	PC	14934	121	612	19.35
6	Mining and Quarrying	MIN	MC	9713	6202	8057	1.21
7	Food Beverage and Tobacco	FBT	MC	5089	3550	1188	3.37
8	Textiles	TEX	MC	13479	4245	828	2.97
9	Wearing Apparel	WAP	MC	1869	3863	14	0.43
10	Leather and Leather Products	LPR	MC	681	2208	138	0.10
11	Wood and Wood Products	WPR	MC	1759	150	64	0.14
12	Paper Products and Publishing	PPP	MC	4655	157	749	0.64
13	Petroleum and Crude and Products	PCP	MC	9565	281	716	0.15
14	Chemicals, Rubber and Plas. Prod	CRP	MC	17214	3133	5625	1.81
15	Non-Metallic Mineral Prod.	NMM	MC	3111	429	233	0.94
16	Iron and Steel	I_S	MC	12867	1193	2043	0.97
17	Non Ferrous Metal	NFM	MC	2652	284	1106	0.34
18	Ferrous Metal Products	FMP	MC	372	799	596	0.49
19	Transport Equipment and Parts	TEM	MC	9908	817	1222	1.48
20	Manufactures including Electronics Equip.	OMF	MC	10009	1399	1498	0.12
21	Machinery and Equipment , nec	OME	MC	17478	1546	9072	0.84
22	Electricity Gas and Water Supply	EGW	MC	26833	0	0	2.72
23	Services	SER	MC	96620	5069	5454	17.28
Notes: PC: Perfect Competition; MC: Monopolistic competition Labor share indicates percent of sectoral employment in 1993-94. Source: i) For Output, Export and Imports, see GTAP 4 Data Base ii) Laborforce is taken from <i>UNIDO</i> , 1995 and <i>World Development Report</i> , 1995.							

TABLE A

USA and EUN relax their import NTBs on textiles and wearing apparel by 50 per cent on imports originating from IND, RSA, ASN, NIE.
Export tax equivalents on exports of textiles and clothing have been reduced by 100 per cent by IND, RSA, ASN and NIE on exports
of textiles and wearing apparel to USA and EUN

Per cent change)												
									EQUIVALENT VARIATIONS		WAGE RATE	RETURN TO CAPITAL
COUNTRY/ REGION	Change in Output		Change in Exports		Change in Imports		Scale Effect		PERCENT	MILLIONS OF DOLLARS		
	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing				
IND	4.8	22.5	25.2	41.5	5.3	-1.6	0.7	0.7	0.7	2275.6	0.3	0.1
USA	8.4	26.4	16.7	31.1	10.8	8.8	1.7	2.0	2.6	2740.7	0.5	1.2
CHN	14.6	19.0	18.6	32.1	6.3	-7.1	1.2	2.4	0.1	744.6	0.4	0.0
WIE	8.3	22.9	6.9	35.5	4.8	-6.0	0.9	1.5	0.1	1299.5	0.2	-0.1
USA	-2.5	-5.6	0.1	-0.7	12.5	19.5	-0.0	0.4	0.2	11303.7	0.0	0.1
CHN	-0.1	-0.4	1.2	-4.1	0.8	2.2	-0.0	-0.0	-0.0	-1928.7	-0.0	-0.0
CHN	-1.8	-2.9	0.1	-1.7	12.5	11.3	0.1	0.2	0.1	7317.6	0.0	0.1

TABLE B
Experiments A plus 15 per cent reduction of import tariffs on textiles and wearing apparel by USA and EUN on imports from
IND, RSA, ASN and NIE

(Per cent change)												
COUNT Y/ REGIO N									EQUIVALENT VARIATIONS		WAGE RATE	RETURN TO CAPITAL
	Change in Output		Change in Exports		Change in Imports		Scale Effect		PERCENT	MILLIONS OF DOLLARS		
	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing				
IND	4.8	22.5	25.1	41.5	5.9	6.2	0.7	0.7	0.7	2303.5	0.3	0.1
RSA	8.3	26.4	16.7	31.1	11.1	9.9	1.7	2.0	2.7	2769.7	0.5	1.2
ASN	14.4	19.0	18.6	32.2	6.8	-4.3	1.3	2.4	0.2	782.9	0.4	0.0
NIE	8.2	22.8	6.9	35.5	5.0	-5.7	0.9	1.5	0.2	1331.1	0.2	-0.1
USA	-2.4	-5.6	0.3	-0.6	12.6	19.5	-0.0	0.4	0.2	11324.5	0.0	0.1
JPN	-0.1	-0.4	1.2	-4.2	0.8	2.2	-0.0	-0.0	-0.0	-1915.6	-0.0	-0.0
EUN	-1.8	-2.8	0.4	-1.4	12.5	11.3	0.1	0.2	0.1	7339.1	0.0	0.1

TABLE C
Experiment B plus 10 per cent reduction of import tariffs on textiles and wearing apparel by
IND, RSA, ASN and NIE on MFN basis

:ent change)												
NTRY/ ION	Change in Output		Change in Exports		Change in Imports		Scale Effect		EQUIVALENT VARIATIONS		WAGE RATE	RETURN TO CAPITAL
									PERCENT	MILLIONS OF DOLLARS		
	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing				
	4.9	23.1	26.2	42.6	10.7	10.3	0.7	0.7	0.8	2469.4	0.3	0.1
	8.0	27.9	17.2	33.0	16.6	18.3	1.8	2.2	2.9	2976.1	0.5	1.2
	14.4	19.8	19.5	33.4	9.2	-3.0	1.4	2.7	0.2	830.0	0.4	0.0
	8.9	23.4	8.1	36.4	5.2	-5.7	1.0	1.7	0.2	1530.6	0.3	-0.1
	-2.5	-5.8	0.3	-0.6	12.7	20.2	-0.0	0.4	0.2	11678.7	0.0	0.1
	-0.2	-0.5	1.0	-4.3	1.2	2.6	-0.0	-0.0	-0.0	-1809.0	-0.0	-0.0
	-1.8	-2.9	0.4	-1.5	12.6	11.5	0.1	0.2	0.1	7500.7	0.0	0.1

TABLE D
Experiment C plus relaxation of import NTBs by 50 per cent on imports of textiles and wearing apparel by IND, RSA, ASN and NIE
on MFN basis

On 1977 Basis												
(Per cent change)												
									EQUIVALENT VARIATIONS		WAGE RATE	RETURN TO CAPITAL
COUNTRY/REGION	Change in Output		Change in Exports		Change in Imports		Scale Effect		PERCENT	MILLIONS OF DOLLARS		
	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing				
IND	4.7	23.1	26.2	42.7	22.0	10.6	0.8	0.7	0.8	2717.1	0.3	0.1
RSA	7.3	28.4	17.4	33.5	22.3	18.1	1.9	2.3	3.1	3219.2	0.5	1.3
ASN	14.4	19.8	19.6	33.4	9.3	-3.0	1.4	2.7	0.2	854.6	0.4	0.0
NIE	9.0	23.4	8.4	36.4	5.2	-5.7	1.0	1.7	0.2	1586.1	0.3	-0.1
USA	-2.5	-5.8	0.7	-0.6	12.7	20.2	-0.0	0.4	0.2	11793.9	0.0	0.1
JPN	-0.2	-0.5	1.6	-4.3	1.3	2.6	-0.0	-0.0	-0.0	-1682.6	-0.0	-0.0
EUN	-1.7	-2.9	0.9	-1.5	12.6	11.5	0.1	0.2	0.1	7733.8	0.0	0.1

TABLE E
Japan relaxes import NTBs on textiles and wearing apparel by 50 per cent on MFN basis

r cent change)												
UNTRY/ GION	Change in Output		Change in Exports		Change in Imports		Scale Effect		EQUIVALENT VARIATIONS		WAGE RATE	RETURN TO CAPITAL
									PERCENT	MILLIONS OF DOLLARS		
	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing				
IND	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	6.4	0.0	0.0
RSA	0.0	-0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.0	0.0
ASN	0.1	0.2	0.0	0.4	0.1	-0.0	0.0	0.0	0.0	15.6	0.0	0.0
NIE	0.1	0.5	0.0	0.8	0.1	-0.1	0.0	0.0	0.0	45.7	0.0	-0.0
USA	0.0	0.1	0.0	1.6	0.0	-0.0	0.0	0.0	-0.0	-37.9	0.0	-0.0
JPN	-0.1	-0.2	0.0	-0.1	-0.1	1.5	-0.0	-0.0	0.0	470.4	-0.0	0.0
EUN	-0.0	-0.0	0.0	-0.0	-0.0	0.0	-0.0	0.0	0.0	4.4	0.0	0.0

TABLE F
Experiment E plus 15 per cent reduction in import tariff on textiles and wearing apparel by Japan on MFN basis

(Per cent change)												
									EQUIVALENT VARIATIONS		WAGE RATE	RETURN TO CAPITAL
COUNTRY/ REGION	Change in Output		Change in Exports		Change in Imports		Scale Effect		PER CENT CHANGE	MILLIONS OF DOLLARS		
	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing	Textiles	Clothing				
IND	-0.0	0.1	-0.0	0.1	0.7	0.2	0.0	0.0	0.0	17.4	0.0	0.0
RSA	-0.1	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	14.3	-0.0	0.0
ASN	-0.1	0.3	0.0	0.4	0.8	0.3	0.0	0.1	0.0	18.0	0.0	0.0
NIE	0.0	0.5	-0.0	0.8	0.4	-0.1	0.0	0.0	0.0	55.7	0.0	-0.0
USA	0.0	0.1	-0.0	1.6	0.1	0.0	0.0	0.0	0.0	15.3	0.0	-0.0
JPN	0.1	-0.2	1.6	2.2	-0.1	1.5	0.0	0.0	0.0	595.6	0.0	0.0
EUN	-0.0	-0.0	-0.0	-0.0	0.0	0.0	-0.0	0.0	0.0	49.9	0.0	0.0

ENDNOTES

¹ See Chadha, Pohit, Deardorff and Stern (1998b). The study is based on a computable general equilibrium (CGE) model that has been specially designed to analyse the potential economic effects of India's trade and domestic policy reforms undertaken during the 1990s.

² See UNCTAD (1996). Exports have been classified under five broad categories on the basis of skill, technology, capital and scale requirements (upgradation factors) at the final product stage. Group I consists of primary commodities including processed foods and requires lowest levels of upgradation factors while Group V includes chemical and pharmaceutical products, computer, office equipment and semiconductors, aircraft and associated equipment, and scientific instruments, watches and photographic equipment. These require the highest levels of upgradation factors. Textiles and clothing fall under Group II, which includes labour-intensive and resource based industries requiring low levels of upgradation factors.

³ See Table 8.1 in Bernard and Kostecki (1995). The MFA-1, concluded in 1973, became operational in 1974. It limited the growth of textile and clothing imports to 6 per cent per annum. A Textiles Surveillance Body was formed to supervise the implementation of MFA under the auspices of the GATT Textiles Committee, which composed of the parties to the arrangement. MFA-II was agreed upon in 1977, which included a five-year extension and provision for 'jointly agreed reasonable departures' from MFA rules under special circumstances. MFA-III was negotiated in 1982, extending the arrangement for five more years. The 'reasonable departure' clause was dropped. It was in 1985 that developing countries covered by the MFA established an International Textile and Clothing Bureau to promote the elimination of the arrangement and the return of trade in textiles and clothing to the GATT. In 1986, MFA-IV introduced further extension of MFA till 1991. MFA was extended again in 1991 till 1994.

⁴ The eight developed country importers included Austria, Canada, the EU, Finland, Japan, Norway, Switzerland and the United States. However, Japan and Switzerland did not apply any import restrictions. Thirty-seven exporting nations were signatories of the MFA-IV in 1994. These are Argentina, Bangladesh, Brazil, China, Colombia, Costa Rica, Czech Republic, Dominican Republic, Egypt, El Salvador, Fiji, Guatemala, Honduras, Hong Kong, Hungary, India, Indonesia, Jamaica, Kenya, Macau, Malaysia, Mexico, Oman, Pakistan, Panama, Peru, Philippines, Poland, Republic of Korea, Romania, Singapore, Slovakia, Slovenia, Sri Lanka, Thailand, Turkey and Uruguay.

⁵ The MFA restrictions have become increasingly more complex as the number of countries and commodities has been enlarged. The MFA-IV includes most major industrial and developing countries and covers products made of cotton, synthetic fibres, wool, silk and ramie, or their blends. See Yang *et al.* (1997).

⁶ In addition to bilateral quota, nondiscriminatory tariffs have frequently been applied on imports of textiles and clothing, even when these products are subject to the MFA.

⁷ The MFA stipulates 6 per cent growth of exports from developing countries. However, in practice the growth rates of bilateral quotas are frequently below the stipulated rate, and in some cases, have even been negative. Developing countries are permitted limited flexibility to transfer an unfilled quota from one category to another ("swing"), use the unused quotas from the previous year ("carry-over") and borrow quotas from the following year ("carry-forward"). See Yang *et al.* (1997).

⁸ Bilateral quotas are generally more severely binding for wearing apparel than for textiles. See Hertel *et al.* (1996).

⁹ The quota rents associated with MFA should, in principle, accrue to the exporting countries. However, Trela and Whalley (1995) emphasise that the potential quota rents might get wasted because of rent seeking stimulated by quota allocation mechanism. Krishna, Erzan and Tan (1994) emphasise the possibility of rent sharing, where part of the quota rents accrue to the importing firms because of large market shares of major importing firms. Even a very large and active market like Hong Kong may be losing close to 50 per cent of its quota rents to importing firms.

¹⁰ Under the ATC agreement, quota growth rates will increase in three stages: by 16 per cent in the first three years; by another 25 per cent in the next four years; and by an additional 27 per cent in the final three years.

¹¹ Recent examples include Brown, Deardorff and Stern (1995, 1996a,b).

¹² Intermediate inputs include both domestic and imported varieties.

¹³ It should be noted that the above source does not provide number of firms data for Taiwan, Thailand, Bangladesh and Sri Lanka. We have used the number of firms figures for the remaining countries in the respective regional aggregations.

¹⁴ We also need data on supply elasticities from ROW and NTB import coverage. For the present exercise, these values have been taken from the Michigan Database.

¹⁵ Relaxing NTBs by 50 per cent is an assumed scenario. One can work with less or more values.