

# Multilateral Trade Reforms Under Doha and Income Distribution in South Asia

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# Introduction and Motivation

- The potential for adverse trade impacts on food security and poverty have been a major area of contention in multilateral trade negotiations under the Doha Round.
- Concerns over rural poverty led to demands for enhanced safeguards for developing countries in agriculture, and the talks collapsed as negotiators failed to reach agreement on this issue.
- It is important to evaluate the likely costs of a failure to reach an agreement, and the costs/benefits of potential alternatives.
- Given the nature of the concerns we need to assess potential effects using not only on aggregate measures such economic welfare, but also on social measures such as income distribution.
- In this paper we present some preliminary results derived from a regional CGE model of South Asia that identifies 47 household groups across the region.

- Hertel and Reimer (2005) and Hertel and Winters (2005) review ex ante studies and provide a method of classification by simulation type: partial equilibrium models, general equilibrium models, and micro/macro simulation models that combine (not always with feedback) macro-level simulation with micro-level household models.
- Several single country models have been used for poverty/income distribution analysis, many linking with a multi-regional model (Gilbert, 2007, for India, Annabi et al., 2006, for Bangladesh, Cockburn, 2002, and Acharya and Cohen, 2007, for Nepal, and Naranpanawa, 2005, for Sri Lanka).
- All use multiple representative household approach, some at detailed household level.
- No studies using this approach in regional model of South Asia (that we have found) except Gilbert (2008), which uses GTAP6.

# South Asian Trade Shares 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
<i>South Asia as Destination</i>								
Bangladesh	8.7	9.0	8.9	9.7	11.3	9.4	9.7	8.3
India	2.0	2.5	2.7	2.8	3.3	2.7	2.6	2.4
Sri Lanka	7.1	7.6	7.8	10.4	12.7	14.3	15.1	17.7
Nepal	45.3	40.0	39.7	46.9	53.6	56.2	61.5	59.5
Pakistan	3.3	3.7	2.8	2.8	2.6	3.3	3.5	4.3
South Asia	3.8	4.3	4.1	4.3	5.0	4.3	4.1	3.9
<i>South Asia as Source</i>								
Bangladesh	0.7	0.9	0.9	0.9	1.2	0.9	0.6	0.5
India	1.8	2.1	1.8	2.0	2.3	1.9	1.8	1.8
Sri Lanka	0.6	0.6	0.6	0.7	0.8	0.8	0.9	0.7
Nepal	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.3
Pakistan	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.6
South Asia	3.8	4.3	4.1	4.3	5.0	4.3	4.1	3.9

Source: COMTRADE

# South Asian Trade Intensity 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
<i>South Asia as Destination</i>								
Bangladesh	8.5	9.0	8.7	8.9	9.3	7.5	6.9	5.9
India	2.0	2.5	2.6	2.5	2.7	2.2	1.8	1.7
Sri Lanka	7.0	7.5	7.6	9.5	10.5	11.5	10.8	12.6
Nepal	44.6	39.9	38.8	43.0	44.3	45.2	43.9	42.4
Pakistan	3.3	3.7	2.8	2.5	2.2	2.7	2.5	3.1
South Asia	3.8	4.2	4.0	3.9	4.2	3.5	2.9	2.8
<i>South Asia as Source</i>								
Bangladesh	7.5	8.2	7.8	8.3	10.2	7.7	6.0	4.8
India	2.6	3.1	2.7	2.6	2.6	2.1	1.7	1.7
Sri Lanka	6.6	6.8	7.5	9.3	11.0	10.3	11.6	10.3
Nepal	25.0	24.2	34.9	37.6	41.5	39.8	37.8	34.4
Pakistan	3.8	4.2	4.0	3.9	4.2	3.5	2.9	2.8
South Asia	2.9	3.3	2.5	2.2	2.0	2.4	2.4	3.3

Source: COMTRADE

# South Asian Trade Complementarity 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
<i>South Asia as Destination</i>								
Bangladesh	40.0	44.6	46.0	52.8	49.5	48.2	44.9	44.5
India	39.3	40.3	42.0	43.7	44.5	47.8	49.7	54.4
Sri Lanka	42.8	47.9	50.2	50.8	51.8	52.3	53.9	57.5
Nepal	46.0	49.7	39.2	45.2	47.6	48.1	50.5	55.2
Pakistan	38.6	37.5	41.0	43.1	43.4	47.6	47.7	50.2
South Asia	46.7	48.6	49.9	52.1	52.7	55.0	54.3	58.9
<i>South Asia as Source</i>								
Bangladesh	5.9	6.4	5.9	7.2	7.0	8.8	6.4	6.2
India	52.5	56.2	58.2	56.5	57.8	59.5	59.2	63.9
Sri Lanka	19.2	23.2	19.5	23.7	20.4	21.0	24.0	23.7
Nepal	20.2	20.9	21.5	26.7	23.8	23.4	26.4	26.6
Pakistan	16.6	16.8	18.4	18.4	18.8	20.7	21.8	21.7
South Asia	46.7	48.6	49.9	52.1	52.7	55.0	54.3	58.9

Source: COMTRADE

# South Asian Trade Export Similarity 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
<i>South Asia as Destination</i>								
Bangladesh	37.3	37.2	36.8	33.9	31.6	31.6	29.2	28.4
India	83.5	83.7	82.6	85.0	84.3	84.2	85.1	85.3
Sri Lanka	53.7	56.3	51.6	49.1	44.6	42.4	43.8	44.7
Nepal	38.7	41.5	44.2	48.2	44.5	45.2	44.4	44.2
Pakistan	51.0	51.9	54.0	52.2	52.4	48.7	51.5	50.4

Source: COMTRADE



# South Asian Trade Protection Levels 2007

	World	Bangladesh	Sri Lanka	India	Nepal	Pakistan
Bangladesh	11.3	-	17.3	10.8	4.4	15.1
Sri Lanka	6.6	6.5	-	6.1	8.6	2.0
India	10.4	17.8	21.3	-	19.2	23.1
Nepal	13.1	8.7	11.6	13.6	-	8.6
Pakistan	11.9	6.6	4.4	8.4	8.7	-

*Source:* TRAINS

# South Asian Trade Poverty Profiles

\$1/day	Year	Headcount	Poverty Gap	Poverty Gap <sup>2</sup>	Gini
Bangladesh	2005	35.3	7.9	2.4	33.2
India-Rural	2005	40.2	9.4	3.1	30.5
India-Urban	2005	19.6	4.2	1.3	37.6
Nepal	2004	24.7	5.6	1.7	47.3
Pakistan	2005	9.0	1.4	0.4	31.2
Sri Lanka	2002	5.8	0.7	0.1	40.2
\$2/day	Year	Headcount	Poverty Gap	Poverty Gap <sup>2</sup>	Gini
Bangladesh	2005	81.5	35.6	18.5	33.2
India-Rural	2005	87.7	39.8	21.0	30.5
India-Urban	2005	61.5	23.1	11.1	37.6
Nepal	2004	64.8	26.4	13.2	47.3
Pakistan	2005	59.5	18.3	7.4	31.2
Sri Lanka	2002	41.5	12.1	4.6	40.2

*Source:* World Bank (2007)

- We have built a new CGE model of South Asia for this study, using the GAMS system.
- Overall, the model would be classified as a competitive, Armington type model, very similar in most respects to the GTAP model.
- The key difference is that the model allows for a detailed specification of multiple representative household units, and thereby can generate insights into the distributional consequences of policy changes.

# Model Structure - Production

- Each firm produces a joint product for domestic and foreign markets, with allocation based on CET.
- Primary factors are used in variable proportions (CES).
- Intermediate goods are used in fixed proportion to value added.
- All purchased intermediates are domestic/import composites (CES) with shares varying by industry.
- All industries are competitive, supplies of primary factors are fixed with variable prices.

# Model Structure - Final Demand

- All final agents in the model consume a CES composite, with shares varying by agent.
- Quantities of government consumption and investment are fixed at their initial levels.
- Each household maximizes a Stone-Geary utility function, which generates an LES demand.
- Households are differentiated by consumption pattern, factor ownership pattern, income taxes and transfers, and savings rates. Changes in representative household welfare is measured by EV.

# Model Structure - International Trade

- International trade is modeled via the Armington assumption.
- The exportable produced by domestic firms is allocated over destination regions using a second level CET function.
- Imports of each country are a CES composite of regional imports, common across all agents in the domestic economy.
- For ROW we reduce the computational complexity of the model by using constant elasticity of demand (CED) functions to represent ROW demand responses. The prices of imports from the ROW are fixed.
- An international transportation sector accounts for the difference between the FOB price of exports and the CIF price of imports. Transportation margins vary by commodity along all international routes.

# Model Structure - International Trade

- The current account balance is fixed and the nominal exchange rate is allowed to vary to maintain balance within each country.
- The numéraire for each country is the consumer price index.
- The nominal exchange rate for the ROW region is fixed.

- The primary data source is the GTAP7 database, with a base year of 2004.
- Information on household income and expenditure structure is obtained from social accounting matrices for Pakistan, India, Sri Lanka, Bangladesh and Nepal, and has been reconciled with the GTAP7 database.
- The aggregation identifies 16 productive sectors, 5 regions (to be expanded) and 5 factors of production. Households disaggregation varies by region: 19 for Pakistan, 10 for Bangladesh, 9 for India, 5 for Sri Lanka, and 4 for Nepal.



# Experimental Design

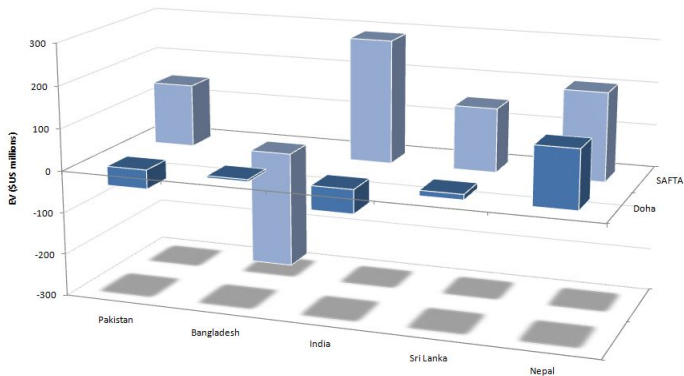
- We construct a series of tariff shocks to replicate as closely as possible the reduction required of the economies in South Asia under the Doha modalities (both agriculture and NAMA). This scenario is called [Doha](#).
- As a benchmark, we consider the implementation of SAFTA, which is modeled simply as the elimination of intra-regional tariffs, leaving all external tariffs in place. This scenario is call [SAFTA](#).
- Both scenarios are run as comparative statics from the base year.
- The factor market closure allows all factors except natural resources to be mobile across economic activities, implying that the simulations are medium run in nature.

# Sensitivity Analysis

- Sensitivity analysis is conducted using an unconditional approach for all scenarios.
- Key parameters are treated as random variables. Each simulation is a Monte-Carlo experiment, with a series of pseudo-random parameter values chosen from the underlying distributions, assumed to be normal and independent.
- We can approximate the mean predictions of the variables of interest, along with indicators of their susceptibility to parametric uncertainty.
- We use antithetic variates to improve the efficiency of the procedure.

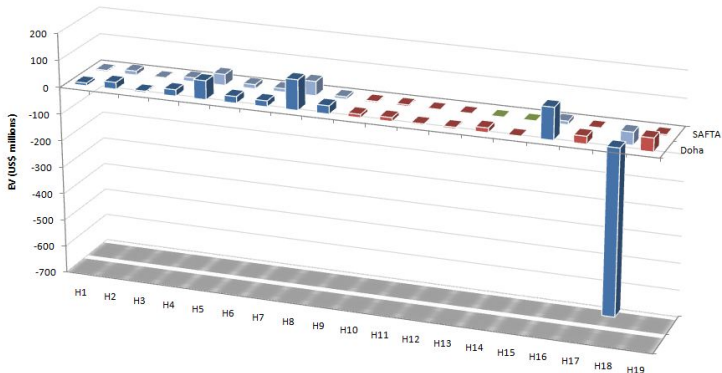
- The modalities on which we base our analysis are contained in the special session of the Committees on Agriculture and NAMA, July 17, 2007,
- For agriculture, the reductions to bound duties follow a tiered formula requiring cuts of 48-73 per cent for developed countries.
- Commitments for developing economies have higher bands and lower required reductions (two-thirds of developed economy levels). The LDCs are not required to undertake any cuts. Some exemptions are allowed for sensitive products.
- For NAMA, the basic proposed cut is a Swiss formula with a coefficient of 8-9 for developed economies and 19-23 for developing economies, applied to bound rates. Several exemptions apply.

# Preliminary Results - Aggregate Welfare



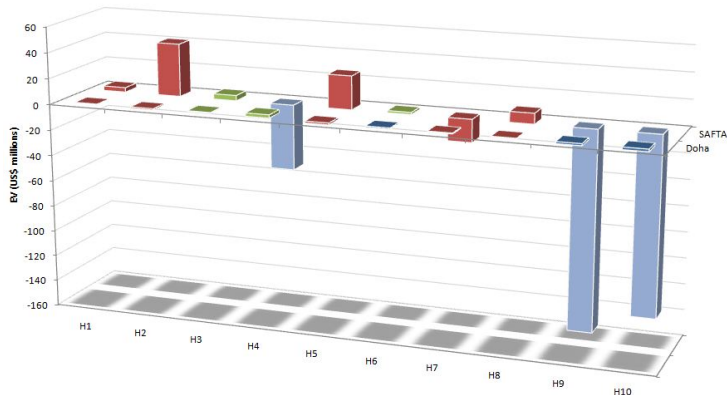
- Largest gains from Doha to Nepal, very similar to SAFTA (reflecting access to India). Effects on other economies small.
- Bangladesh estimated to lose under SAFTA, modest gains to other countries.

# Preliminary Household Results - Pakistan



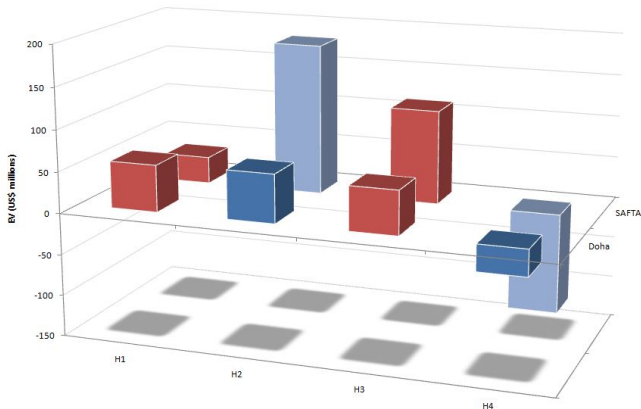
- Rural groups do quite well under both Doha and SAFTA.
- Only negative effect at household level is on the urban rich (under Doha especially).

# Preliminary Household Results - Bangladesh



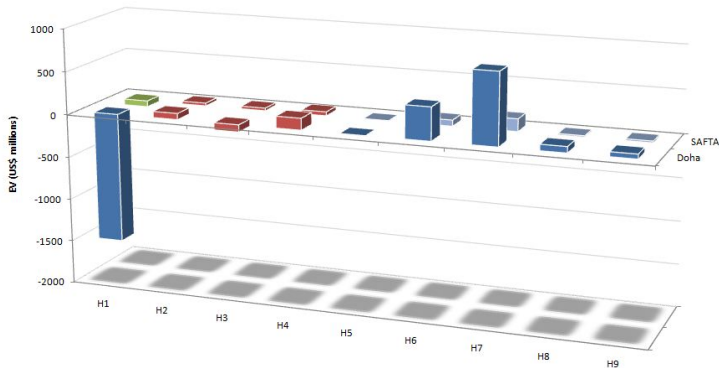
- Very little movement under Doha.
- Under SAFTA, rural poor do quite well, strong negative impact on urban rich.

# Preliminary Household Results - Nepal



- Again, rural groups fare quite well in both scenarios.
- Loser under both scenarios is the urban household.

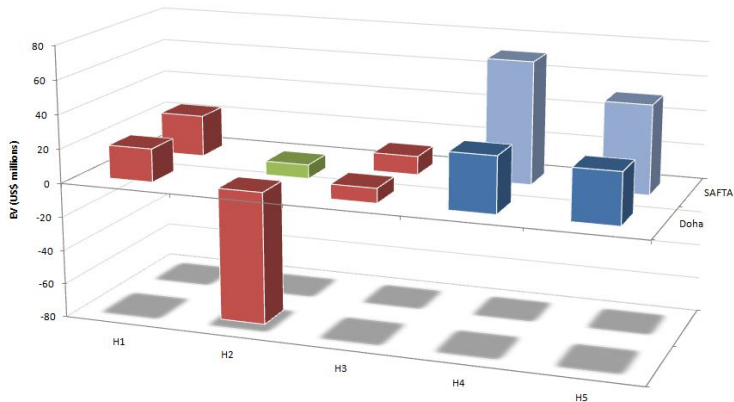
# Preliminary Household Results - India



- As in other cases, the small aggregate effect masks strong distributional changes.
- The major loser (under Doha) is large rural land owners.



# Preliminary Household Results - Sri Lanka



- The largest losing group (under Doha) is the rural poor.

# Concluding Comments

- Assessing the impact of trade reform on different household groups is difficult because of the numerous pathways to income changes. Broad conclusions about the effects are not possible.
- Although liberalization under Doha or SAFTA would have modest overall impacts for most countries (exception: Nepal), in many cases the distributional effects are significant.
- In this model, the results do not seem to fit the stylized fact that multilateral (or regional) trade reforms in South Asia would generally hurt the rural poor.
- The main exception is Sri Lanka, where the rural poor are indeed estimated to be the main loser from trade reforms.

- Incorporate a more detailed series of shocks constructed using information from WITS.
- Capture the market access side of the Doha modalities either using another model to estimate terms of trade effects, or (preferably) endogenizing a set of major trade partners within the model.
- Spend more time tracing through the household level effects to develop a better story about why the various household groups are adversely affected (primarily through factor price changes and variations in consumption patterns).