Regional Trade Reform Under SAFTA and Income Distribution in South Asia

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Abstract

South Asia is one of the world's poorest regions. In this paper we use a representative household model of South Asia to explore the potential impacts of regional trade liberalization under the auspices of SAFTA on both the distribution of economic gains across the countries of South Asia, and across various groups within South Asia. We also discuss the underlying theory of a potential extension to our approach.

1 Introduction

The issues surrounding the potential for adverse trade impacts on food security and poverty have been a major area of contention in both multilateral and regional trade negotiations. Hence, it is important to evaluate the likely costs and benefits of regional trade liberalization in terms not only of aggregate measures such economic welfare, but also on social measures such as income distribution, especially for the developing economies. This provides policymakers with information not only on the overall costs/benefits, but also on the areas where complementary policy interventions may be required.

There has been significant recent interest in using computable general equilibrium (CGE) methods for analyzing the relationship between trade reform and income distribution/poverty. Hertel and Reimer (2005) and Hertel and Winters (2005) survey recent CGE attempts to assess the poverty impact of trade liberalization, while studies applying to countries in the Asia-Pacific region are surveyed in Gilbert (2008). With respect to South-Asia, recent work by Pradhan and Sahoo (2006), Gilbert (2007), Pandar and Ganesh-Kumar (2008) and Polaski et al. (2008)

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considers India, while results for Bangladesh are available from Annabi et al. (2006) and Raihan (2008). Naranpanawa (2005) considers Sri Lanka. Ahmed and O'Donoghue (2008) have a model of Pakistan that can generate information on poverty, although they apply it to macroeconomic shocks rather than trade reform.

Most of these studies use single economy models, sometimes in combination with a global model such as GTAP or LINKAGE, to analyze the socioeconomic impacts of policy changes on a single economy in the region. Gilbert (2008) differs in that it attempts to deal with household income distribution issues in the context of the whole region simultaneously, using a disaggregated CGE model. Since the regional trade reforms involve multiple sectors and regions, an approach that captures potential feedback effects across a region has some advantages. This is particularly important in the case of South Asia, where economic relations with India are a dominant factor in the outcomes for other smaller economies. Hence, a model of the effects of regional trade reform on Sri Lanka in isolation, for example, may be seriously misleading if the indirect effects felt via reform's impact on India are not taken into account.

In this paper we use a computable general equilibrium (CGE) model of South Asia to analyze the economic impact of the South Asian Free Trade Agreement (SAFTA) on the economies of South Asia. The model is similar in structure to that used in Gilbert (2008). But, whereas that model used the Global Trade Analysis Project (GTAP) Version 6 database with a base year of 2001, this study uses the GTAP7 database with a base year of 2004. The model has also been extended to include Pakistan. The model features multiple (between 5 and 18) households in each of the economies of the region.

The structure of the paper is as follows. In Section 2 we review the existing CGE studies of trade reform in South Asia. In Section 3 we review the policy background and use trade indices to evaluate the current trading environment in the region. The next section describes the structure of the model we have used, data sources and experimental design. In Section 4 we present our results and discussion. In Section 5 we discuss the underlying theory of a potential extension. Concluding comments follow.

2 Literature Review

The linkages between trade reform and poverty, and developing ways to quantitatively assess those linkages have been the subject of intense recent research. Hertel and Reimer (2005) and

Hertel and Winters (2005) have reviewed *ex ante* studies and provide a method of classification by simulation type: partial equilibrium models, CGE models, and micro/macro simulation models that combine (not always with feedback) macro-level simulation with micro-level household models. They conclude that CGE techniques and micro/macro methods have the best potential for fully evaluating the complex web of determinants of changes in poverty *ex ante*.

Within the recent CGE literature there are a range of ways of addressing poverty impacts of trade reform. Aggregate results at the regional level, such as impacts on prices of staples or returns to unskilled labor, may be combined with ad-hoc observations on potential effects on poverty. Other studies take results from a global model with a single representative household, and pass them through a sub-model to determine the poverty impact. Another approach is to build more sophisticated sub-models of household behavior, or to incorporate income distribution at the household level directly within a regional CGE model. Several studies of this type can be seen in Hertel and Winters (2006) and OECD (2006).

The most straightforward method for dealing with income distribution and poverty impacts in a CGE framework is to abandon the single representative consumer approach and to incorporate multiple representative household groups into the model. This allows the model to track inter-group income changes directly, but leaves the issue of intra-group income changes external to the model. The greater the number of the household groups, the better the model will be able to capture the pattern of income changes. Recent efforts typically feature between 5 and 10 household categories, though a few have many more.

Several recent CGE studies have used the multiple household approach to analyze the consequences of trade reform in South Asia. These studies have tended to use single economy models for the distribution analysis, often in combination with a global model used for estimating world price impacts of the proposed scenarios. There are a number of studies of India.[1] Gilbert (2007) considers the impact of the current proposed modalities for reform in agriculture only under Doha at the household level for India, in addition to more comprehensive agricultural reform. The study uses the GTAP model to estimate the world market effects. The global results are then input into a single economy CGE model of India, which is a competitive CGE of the Armington variety. Under the Doha scenarios, the welfare of the poorest households (agricultural labor and other rural labor) falls, while the welfare of the richest group (urban self-employed)

[1] This survey draws on the working paper by Gilbert and Banik (2010), which presents a greatly extended version.

rises, in both the short and long run. The income of rural self employed (land owners) also rises under the Doha scenarios, suggesting that ownership of land and capital helps to insulate this group from the terms of trade shifts. The result is similar to that of Annabi et al. (2006) for Bangladesh. Under comprehensive reform the aggregate welfare gains are several orders of magnitude larger, and all households except the rural self-employed rise, suggesting that India's land owning class is able to benefit from rising world prices under Doha reform when India does not engage in significant reforms of its own, but faces considerable falls in income if domestic prices are allowed to fall. Pradhan and Sahoo (2006) use a similar CGE structure in their analysis of potential trade reform scenarios for India and reach similar conclusions.

Panda and Ganesh-Kumar (2008) consider the issue of food security with changes in trade policy. Their modeling approach is very similar to that used in Gilbert (2007), with the exception that they use the MIRAGE model developed by IFPRI as the source of their global price changes rather than GTAP. They consider a Doha scenario, and find that all households experience a rise in welfare, and a decline in poverty. Their conclusions are based on a ex-post assessment of the household consumption patterns which drive the CGE model. Finally, Polaski et al. (2008) use a single-economy CGE of India, based on a very detailed SAM for 1998-99. They consider the impact of price changes in agricultural commodities, and find that a decrease in the price of rice could have a significant negative impact on Indian poverty levels.

Results for Bangladesh are available from Annabi et al. (2006) and Raihan (2008). Annabi et al. (2006) uses the GTAP model to estimate the overall effect of trade reform under the Doha proposals (both agriculture and non-agriculture) at the world level, and then inputs the world market effects into a single economy CGE model for Bangladesh. The single country model is used to generate detailed results at the household level. In addition to the Doha agenda, the study also considers the potential impact of more comprehensive global reform, and of unilateral reform by Bangladesh. The results indicate aggregate welfare losses for Bangladesh under the Doha scenarios, along with small increases in the headcount ratio (diminishing somewhat but remaining negative in the long run). The negative aggregate welfare effect is driven by adverse terms of trade movements. These remain even in a scenario with complete liberalization in the rest of the world. Raihan (2008) argues that the effects of unilateral reform in the aggregate are positive but small, suggesting that the export bias of the current regime is minimal. Unfortunately, the paper does not directly discuss poverty or income distribution impacts.

Two studies are available for Nepal, Cockburn (2002) and Acharya and Cohen (2008). Cockburn (2002) constructs a CGE model of Nepal that explicitly models all households from a nationally representative household survey. The model is a archetype competitive CGE, but with a high degree of household disaggregation. The base year of the model is 1986, and the model incorporates 15 production activities. They consider a trade liberalization scenario and find that urban poverty falls and rural poverty increases as initial tariffs were highest for agriculture. Impacts increase with income level, resulting in rising income inequality. Acharya and Cohen (2007) consider unilateral trade reform. They conclude that that the results are not conclusively pro-poor in that one of the richer household groups benefits most, while the benefit to the poorest household group is only modest. Therefore, they suggest that complementary policies are required to make trade liberalization pro-poor in Nepal.

Sri Lanka has been the focus of several CGE studies, many surveyed by Dasanayake (2000).[2] The most recent study is by Naranpanawa (2005), which considers a manufactured good trade liberalization scenario, and find that the potential benefits accruing to low income rural groups are low relative to other groups in the in the model, a fact attributed to a reduction in transfers following falls in government revenue. Long run liberalization reduces absolute poverty in all groups, with manufacturing reform being more pro-poor than agricultural reform, but may increase relative poverty.

Pakistan has also been the subject of several recent CGE studies. Ahmed and O'Donoghue (2008) use a single economy CGE to examine various macroeconomic shocks. The CGE model is combined with a microsimulation model to generate poverty information. Prices, wages, and aggregate employment variables from the CGE model are used as input to a micro-simulation model that generates changes in individual wages, self-employment incomes and employment status. Amongst the most important results, they find that external oil price shocks have the highest potential to impact the socio-economy. Poverty increases when the overall import price increases, but inequality is most adversely impacted by a rise in the import price of petroleum.

There are few studies that attempt to deal with household income distribution issues in the context of the whole region simultaneously, using a disaggregated CGE model. Khan (2008) presents very preliminary results for a prototype model for South Asia. The model is an interesting approach, incorporating several non-standard features, including technological dualism and rural-urban migration of the Harris-Todaro type. However, it has been calibrated to a single country (India) at present. Hence the results are relevant for other countries in the region only

[2] This study also briefly reviews some of the earlier CGE studies of India, Bangladesh and Nepal.

by extension in the models' current form, although the approach might be usefully adapted to other countries. Gilbert (2008) uses the same basic model as presented here, but with fewer countries and an older dataset, to examine SAFTA. In terms of the overall policy message, the results of this study confirm those of earlier work by Bandara and Yu (2003) in that the overall welfare effects of trade reform under the auspices of SAFTA are likely to be small.

3 South Asian Trade and Poverty Patterns

The latest development in a long line of regional trading efforts in South Asia (Bandara and Yu, 2003, provide a more detailed description of the evolution of economic integration in the region), SAFTA will require that the developing economies of South Asia reduce their tariffs to a maximum of 20 per cent initially, followed by annual cuts to zero over a five year period for developing economies and an eight year period for LDCs. In order to assess the potential impact of closer trading relations between the economies of SAFTA it is useful to begin with an assessment of the current trade and protection pattern, along with the poverty profiles.[3]

Regional trade shares (exports plus imports) are presented in Table 1.[4] The first set of numbers (South Asia as destination) show the percentage of South Asian economy exports that are directed to other economies in South Asia. The second set (South Asia as source) show the percentage of exports from South Asian economies that are directed to the individual economies of South Asia. Evidently, for most economies within South Asia, excepting Nepal, the regional market is only a small proportion of their external trade. Intra-regional trade has grown in importance over recent years for some economies (Nepal, Sri Lanka and Pakistan), but has remained stagnant for others. Overall, the intra-regional trade share for South Asia has remained constant at roughly four per cent, a low level relative to other regions.

The trade intensity index, defined as the ratio of the intra-regional trade share to the share of the region in world trade, gives an indication of the degree to which a particular trade linkage is stronger than might be expected given the size of the economies in world trade. The index is presented in Table 2. Values greater than one indicate an 'intense' trading relationship. Normalized in this way, the trading relationships in the region appear somewhat stronger, reflecting in part geographical proximity. However, it is clear that smaller economies in the

[3]This section follows Gilbert (2008). Details on the indices can be found in Mikic and Gilbert (2009).

[4]Our calculations are based on COMTRADE data from 1999-2006. Calculations are based on reporter data, but where this information is missing we have reconstructed the relevant flows using the mirror data from partners.

region are heavily reliant on trade with the larger economies, and that trade in the region is higher than would be expected given the size of South Asia in world trade.

Turning to the sectoral trade profiles, the complementarity index measures the overlap between the export profile of one region and the import profile of another.[5] The index is often used *ex ante* to evaluate the potential for mutually beneficial inter-industry trade. The results are presented in Table 3. A value of 100 indicates a perfect match of the trade profiles, while an index of 0 indicates no overlap. Overall, it seem that the degree of complementarity has been increasing over the period, although it remains at a relatively low level.

Finally, consider the export similarity profiles in Table 4. Constructed in much the same way as the complementarity index, a vlaue of 100 indicates that the two groups share identical export profiles, while an index of 0 indicates that the two groups compete in entirely separate markets. The calculations compare each country with South Asia as a whole. Hence, the figures for India are inflated by its dominant role in the group.[6] Nonetheless, for Nepal, Sri Lanka and Pakistan, the similarity indices remain high. In other words, the countries of South Asia have a revealed comparative advantage in similar products. The values of the index are declining over time, however. In conjunction with the increase in complementarity, this perhaps suggests production shifts gradually aligning.

Table 5 describes the state of protection in the countries of interest, using the bilateral applied tariff (trade weighted). Substantial progress has been made in lowering the average level of protection in the South Asian economies over the last decade, but applied tariffs remain moderately high on average, with a tendency toward high agricultural protection, especially in India. However, there is also a substantial degree of binding overhang, especially in Bangladesh, but also India and Sri Lanka. Overall, the protection levels in the South Asia suggest that there is significant potential for efficiency gains from trade reform in general.

Finally, Table 6 reviews the poverty/income distribution statistics in the region. These have been drawn from World Bank (2007), and we have extracted the latest available year for each economy in South Asia for which data is available. The figures reflect South Asia's status as one of the world's poorest regions. While the headcount ratio in India has been falling since 1996, and poverty depth and severity has also fallen over the period, the proportion of population in poverty in India remains high, and there is also considerable variation in poverty levels

[5]We have calculated the index using COMTRADE data using HS1996 2-digit classifications.
[6]A country's export similarity with itself is, by definition, 100 per cent.

between urban and rural populations. In Bangladesh the poverty headcount is even higher, at 35 percent, while it is 25 percent in Nepal. In Pakistan and Sri Lanka, the rates are much lower at 9 and 6 percent, respectively. Nonetheless, poverty remains an issue, at the $2/day level the corresponding rates are 60 and 41 percent. Two other measures are provided in Table 6, both of which attempt to address the issue of poverty depth. The poverty gap measure is the mean distance below the poverty line as a proportion of the poverty line. The squared poverty gap weights individual poverty gaps by the gaps themselves, and provides a measure of inequality among the poor. The areas with the greatest poverty depth are again Bangladesh, rural India and Nepal. Finally, the Gini coefficient is a common measure of overall income inequality, with the greatest levels of inequality in Nepal and Sri Lanka.

4 Methodology

To analyze the effect of these proposals on the economies of South Asia, we use a custom-built CGE model of the region, with sub-economy models for key countries, programmed using the GAMS system. This section outlines key characteristics of the model structure and experimental design. The model covers India, Bangladesh, Sri Lanka, Pakistan, and rest of South Asia, as well as an incompletely modeled ROW region. Overall, the structure of the model that we built for this study is a similar in many respects to GTAP and other global models. Hence, we keep our description brief.

4.1 Model

The model identifies 16 production sectors. Each sector produces a joint product for domestic and foreign markets, with the allocation between the two based on a constant elasticity of transformation (CET) function. The production functions are nested constant elasticity of substitution (CES) functions with intermediate goods used in fixed proportions and all primary factors in variable proportions with a common elasticity. Intermediate inputs are composites of imported goods and domestic production, with proportions that are variable and specified independently by industry.

Competitive conditions hold, so firms pay market prices for all inputs, and make zero (economic) profit. Primary endowments are fixed, and may be treated as specific or mobile. The dataset contains five primary factors. In the default medium run closure we treat all factors except natural resources as mobile across economic activities.

The model identifies several consumption activities, the government, investment, and multiple consumer households. The number of consumer households varies by region depending on available data, with between four and 19 categories in the various regions. Final consumption of each household is modeled using Stone-Geary utility functions, which generate linear expenditure systems (LES) characterizing demand for each household category. Changes in household welfare are measured by equivalent variation (EV).[7] The parameters of the functions vary by household to capture differences in consumption patterns. The quantity of government consumption and investment is held constant in the default closure. All agents consume composites of imported goods and domestic production, with proportions that are variable and specified independently by agent (sometimes called the SALTER specification). On the income side, factors are owned in varying proportions by the households, and we maintain fixed proportions in household savings, taxation and government transfers.

The exportable produced by domestic firms is allocated over destination regions using a second level CET function, hence the aggregate exportable is a composite of exports to the various regions (the elasticity on both CET functions is set such that export destinations are very close to being perfectly substitutable, with elasticities of 20 and 40 at the lower and upper levels, respectively). Similarly, on the import side, the imports of each country are a CES composite of regional imports (i.e., a second level Armington function). Unlike at the first level, this function is common across all agents in the domestic economy. Demand for regional exports is derived from the Armington import structure for all regions that are explicitly modeled. For regions that are not explicitly modeled, here the ROW region, we reduce the computational complexity of the model by using constant elasticity of demand (CED) functions to represent demand responses. The prices of imports from the ROW region 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. Unlike in the GTAP model, because of our focus on a single relatively small (in global terms) region, we fix the price of international transportation services.

The price normalization and closure rules are similar to those used in many single country

[7]EV is the monetary value of the increment in income that would have to be given to (or taken away from) a household at today's prices to make them as well off today as they would be under the proposed policy change.

models. The current account balance is fixed and the nominal exchange rate is allowed to vary to maintain balance within each country. The numeraire in each country is the consumer price index. We must also define a numeraire region for which the nominal exchange rate is fixed, which in this model is the ROW region.

The model includes a full range of distortions in the form of taxes and subsidies on economic activities at all levels to ensure that the second-best implications of the policy scenarios are adequately accounted for.

4.2 Data

The CGE model requires appropriate data in the form of a Social Accounting Matrices (SAM) for each country, trade flow matrices, and estimates of the model parameters and their distributions.[8] These have been compiled from various sources, and reconciled prior to model implementation.

The base data on trade, production, aggregate consumption and employment, is extracted from the GTAP7 database. GTAP7 and has a base year of 2004. Information on sources of household income (ownership of primary factors and transfers/taxes) and variation in consumption patterns across households are obtained from Pradhan and Sahoo (2006) for India, Fontana and Wobst (2001) for Bangladesh, Naranpanawa (2005) for Sri Lanka, and Roland-Holst (2008) for Pakistan.[9] The household categories used in the model are listed in Table 7. The information in each study was aggregated/disaggregated and rebalanced where necessary to match the dimensions of our model and to be consistent with the aggregate GTAP7 household consumption data.[10]

Model elasticity parameters are obtained from the existing estimates in GTAP7. Armington elasticities have recently been estimated by Hertel et al. (2007). Base substitution elasticities in production are also obtained from GTAP7.

[8] The SAM is an account of all of the flows between economic agents at a point in time.

[9] A newer SAM from Saluja and Yadav (2006) has a base year of 2003-4, has 73 productive sectors and 10 household categories, defined by expenditure level. We may update the model to include information from this SAM at a later date.

[10] The procedure we used was to first split the factor income proportions across skilled and unskilled labor using the aggregate level of factor use in GTAP7 and the allocation of labor to agricultural/non-agricultural activities. Once this mapping was complete we were able to construct household incomes consistent with the GTAP7 data. These generally matched the proportions in the original data quite closely. We then matched the consumption categories to GTAP categories, and used the overall GTAP consumption proportions to split the individual household proportions where necessary. Finally, we used the RAS method to ensure that the household consumption shares were consistent with the household incomes and total expenditures in GTAP7. This process was undertaken for each country in the model.

4.3 Experimental Design

The model is quite general in purpose, and can in principle be useful to examine a variety of developments in South Asia. We consider a regional economic integration scenario representing SAFTA, which involves the removal of only internal tariffs in the region. The simulation is run as a comparative static, so the results should be interpreted as representing how the economic system would have appeared in the base year had the proposed changes been implemented and the economic system given sufficient time to adjust to the new equilibrium. As noted above, 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 is implemented within the simulations by using an unconditional approach adopted in Gilbert and Wahl (2003). This approach improves the policy value of the simulations by highlighting results that are unlikely to be robust, and providing an estimate of the range of potential outcomes rather than a point estimate. To undertake the analysis, key parameters (the trade elasticities) are treated as normally and independently distributed random variables.[11] Each simulation is run as a Monte-Carlo experiment, with a series of pseudo-random parameter values chosen from the underlying distributions. With a large number of iterations (we have used 1000) of the simulation we can approximate the mean predictions of the variables of interest, along with indicators of their susceptibility to parametric uncertainty (the standard deviations), and the accuracy of the simulation procedure (the standard errors). This general technique is valid for any type of model structure and the computational complexity does not increase with the number of parameters that are allowed to vary. It is, however, computationally expensive. Variance reduction techniques can therefore be usefully be applied here. The two techniques that we use are to run alternative simulations using common random numbers, and to adopt antithetic variates in the sampling. The former ensures that the same pseudo-random numbers are drawn for alternative simulations, and therefore that alternatives can be compared without the risk of a skewed draw. Antithetic variates uses the mean of symmetric draws from the underlying distribution as the estimator for mean predictions. Since most of the variables of interest vary monotonically with the elasticities that we treat as random variables, this technique dramatically reduces the standard errors in our preliminary tests (i.e., improves it the accuracy of the mean estimates). In simulations with 1000 draws the standard errors were

[11] We have followed Gilbert and Wahl (2003) and used a uniform margin, here a default standard deviation of 7.5 percent of the mean value from GTAP7, implying that almost all variation will occur within 25 percent of the mean.

roughly halved relative to 2000 fully random draws, a reduction that would require quadrupling the number of iterations under fully random draws. That is, simulations using 1000 antithetic variates generates a level of accuracy equivalent to 8000 fully random draws.

5 Results and Discussion

The preliminary results of our analysis are presented in Table 8, which covers economic welfare effects by household and country, and Table 9, which presents information on production shifts. First consider the impact of the trade reforms on overall economic welfare. The results of our simulations, using the household EV measure, are presented in the third row from the bottom of Table 8, labeled 'total'. This type of estimate of the benefit/cost of the proposed change is sometimes called a 'one off' gain/loss. However, this is somewhat misleading since the changes are permanent. Rather we can think of this (roughly) as a permanent increment to household incomes, at constant prices. In terms of a true 'one off' measure of the benefit/cost, we need to discount the permanent income stream measured by the EV. If the discount rate is assumed to be a standard two percent, then the total estimated benefit is fifty times the annual increment, and this is the row labeled 'cumulative'. We can think of this as the total benefit of the reduction in trade barriers.[12] The projected benefits of SAFTA are positive for all economies except Bangladesh. India is the biggest winner, followed by the aggregate 'rest of South Asia' (Nepal, Maldives and others). These results are consistent with those in Gilbert (2008), and all are robust to underlying parameter uncertainty.

In terms of relative benefits, we can evaluate the estimated welfare impact relative to a baseline metric, most commonly the initial GDP. The final row of Table 8 expresses the cumulative gain as a proportion of GDP. Viewed from this perspective, by far the biggest beneficiary trade reforms under both SAFTA is teh rest of South Asia region, by a substantial margin. Nepal is followed by Sri Lanka, with the gains to India from SAFTA being quite small when expressed as a percent of GDP. The large gains to the rest of South Asia reflect significant improvements in market access to its dominant trading partner, India.

On the surface it appears that the simulation results would support (at least in terms of overall efficiency) a regional trade reform process through SAFTA, although as might be

[12]For a variety of reasons, this estimate is likely to be very much a lower bound, since the comparative static simulation technique used here does not capture any potential dynamic accumulation effects (i.e., some proportion of the increment to income may be invested, leading to a multiplier effect), and the competitive model used does not account for potential scale effects.

expected given the similarity of the export profiles as discussed above, the gains from SAFTA are also modest.

Before turning to the estimated impact on household welfare, it is useful to review the household categories in the model, as presented in Table 7. In the Sri Lankan data, we have five household groups, broken down by location and income level into rural/urban and high income/low income groupings. The data for India, Pakistan and Bangladesh is grouped by archetype.

In India, group H2 (rural agricultural labor) is the poorest group, by a substantial margin, followed by H4 (other rural) and H3 (rural non-agricultural labor). The richest groups are H6 (urban self-employed) and H7 (urban salaried). The households differ substantially in their ownership of productive factors, with the richest rural group (H1, rural self-employed) being substantial owners of land and capital. On the other hand, the poorer households, especially H2, receive income almost exclusively from selling their own labor (a large fraction of which is unskilled). Comparing the poorest two groups (H2 and H4) with the richest two (H6 and H7), we observe significant differences in spending patterns also, although the differences are not as great as in ownership of productive resources. In particular, the two poorest groups spend nearly 2.5 times as much of their income on basic food items (in particular processed rice), as the two richest groups. In textiles the pattern is less dramatic, but the poor groups spend about 30 percent more than the rich groups.

In Bangladesh, the poorest groups are H1 and H2, rural groups with only limited or no holdings of land. The are followed by H7, H3 and to a lesser extent H8, that is the urban illiterate and poorly educated, and rural households with small land holdings. The richest groups, by a substantial margin, are urban households with high or medium education (H9 and H10). The factor allocation pattern is similar to India, with the lower income groups having a much higher dependence on unskilled labor. Consumption differences are also similar, with the poorest households devoting more than double the proportion of their budget to processed rice than the richest households.

In the Pakistan data, as with Sri Lanka, we have a combined archetype and income level classification. The data is very detailed, with a concentration on rural households. Households are grouped into multiple farm sizes based on land holdings, and three regions, in addition to the rural rich, and urban poor/rich. In total, our model tracks changes in the behavior of 47 household groups in the region.

The decomposition of the total welfare impacts on the various household groups is summarized in Table 8. Figures drawn in a box are not robust to changes in the underlying parameters of the model, i.e., we cannot be sure of the sign of the change. Other values are robust given the assumptions on the parameter distributions.[13]

The results for Pakistan indicate that all households except one are estimated to gain (with a couple not robust). The losing household is the urban rich. The overall impact is positive, and the policy is likely to be pro-poor. For Bangladesh, again the groups that at hurt by reform are the urban rich (H9 and H10). These results are interesting given the debate, which has focused on negative impacts on the rural poor. At least for these three economies, trade reform does not hurt the rural poor as feared, but rather the urban rich. Of course, from a political economy perspective, this could be highly problematic.

In India also there is a highly skewed income distribution effect, with group H1 being a serious loser from trade reform under SAFTA (although the result is not very robust). The H1 group represents rural landowners. On the whole, this groups is not really poor, so the policies are again not hurting the rural poor (groups H2, H3 and H4), but rather the rural rich. Again, this might have significant political economy implications.

The only result that is consistent with the conventional wisdom is for Sri Lanka, where the model projects a reduction in household incomes only for group H2, the rural poor. All other households gain. Again, the result is not robust in the SAFTA scenario. Nonetheless, this is a concerning. It suggests that the impact of trade reform in Sri Lanka may hit the poorest groups in society relatively hard. Since the overall gains are positive, a redistribution makes it feasible to make all groups better off, in principle.

Overall then, the impacts of the changes at the household level exhibit more variation than the aggregate results. While the the trade policy scenarios considered here appear to be pro-poor in an absolute sense in some cases, there is little doubt that some household groups would be hard hit by trade liberalization under SAFTA. In most cases, it is relatively advantaged groups that are hurt by reforms, not the rural poor. Our calculations are based on assumption of invariant transfers, taxes and factor ownership, but in principle these can be changed if the political will exists.

In addition to overall welfare effects, and their distribution across various groups in the

[13] Roughly, a result can be considered robust to the assumed underlying parametric uncertainty if it retains the same sign within two standard deviations of the mean.

societies in question, CGE simulation also generates sectoral information. Of particular interest are changes in the production structure, both because they indicate which sectors are most likely to be impacted by the proposed policy, and because they provide an indication of the potential degree of structural adjustment required. Estimates of the sectoral production changes are presented in Table 9. Again, results that are not considered robust under our sensitivity analysis are highlighted with a box.

Overall, the biggest adjustments are expected in the rest of South Asia region, under both scenarios, with large expansions in chemicals and metal production, smaller expansions in textiles, and declines in agriculture textiles and heavy manufactures. The pattern is similar in Sri Lanka, while the production shifts in India are all very small, suggesting little adjustment difficulty.

6 A Future Extension

One assumption of this type of representative household model is that labor can move freely across economic activities. However, this assumption may be misleading. Indeed, it seems that labor owned by poorer households would be less mobile, and ideally we would like to take this into account. While a number of CGE models incorporate imperfect labor mobility at the factor level (e.g., GTAP and Gilbert and Wahl, 2003), they feature single representative households. To understand the implications of imperfect labor mobility for household welfare responses to trade reform, we need to first develop a framework for exploring the impact on factor incomes. We conclude this paper with some theoretical considerations.

Consider a simple two-sector general equilibrium model along the lines of Casas (1984). Let the two sectors be X and Y and the two factors be capital and labor (K and L). K is mobile across activities, while L is mobile but sluggish, resulting in a differential wage at equilibrium. All other neoclassical assumptions apply. The production specification is thus rather standard, the zero profit conditions for firms are expressed in terms of the unit cost functions c_j as:

$$c_X(w_X, r) = p \tag{1}$$

$$c_Y(w_Y, r) = 1 \tag{2}$$

where w_j is the price of labor in industry j and r in the price of capital. We have chosen the price of Y as the numeraire. Full employment of factors of production implies that:

$$a_{LX}X + a_{LY}Y = L \tag{3}$$

$$a_{KX}X + a_{KY}Y = K \tag{4}$$

where a_{ij} is the optimal unit demand for factor i in industry j, obtained by the derivative properties of the unit cost functions. Now suppose that the economy contains multiple household units which own the factors of production in varying proportions. Let the set of households be denoted $\mathbf{H}$ with elements indexed by h. Suppose that each household's relative allocation of labor across industries is a function of the relative wages such that:

$$\frac{w_X}{w_Y} = \psi_h \left(\frac{L_X^h}{L_Y^h} \right)$$

where $\psi_h' > 0$, and L_j^h is the amount of household h's labor employed in industry j. We can think of these expressions as relative labor supply functions. Since labor is homogeneous, by summing across households we obtain the aggregate function:

$$\frac{w_X}{w_Y} = \psi \left(\frac{a_{LX}X}{a_{LY}Y} \right) = \sum_{\forall h \in \mathbf{H}} \psi_h \left(\frac{L_X^h}{L_Y^h} \right) \tag{5}$$

where we have made use of the fact that total labor supplies of households to each industry equal industry demands at equilibrium.

Now, differentiating the system holding endowments constant and utilizing the well-known solutions for the optimal unit demands (see Jones, 1965) we obtain the following system of equations of change:

$$\theta_{LX}\hat{w}_X + \theta_{KX}\hat{r} = \hat{p} \tag{6}$$

$$\theta_{LY}\hat{w}_Y + \theta_{KY}\hat{r} = 0 \tag{7}$$

$$\lambda_{LX}\hat{X} + \lambda_{LY}\hat{Y} = \delta_{LX}(\hat{w}_X - \hat{r}) + \delta_{LY}(\hat{w}_Y - \hat{r}) \tag{8}$$

$$\lambda_{KX}\hat{X} + \lambda_{KY}\hat{Y} = -\delta_{KX}(\hat{w}_X - \hat{r}) - \delta_{KY}(\hat{w}_Y - \hat{r}) \tag{9}$$

$$\varepsilon(\hat{w}_X - \hat{w}_Y) = (\hat{X} - \hat{Y}) + \sigma[\theta_{KY}(\hat{w}_Y - \hat{r}) - \theta_{KX}(\hat{w}_X - \hat{r})] \tag{10}$$

where a circumflex denotes a proportional change, θ_{ij} is the cost share of factor i in sector j, λ_{ij} is the proportion of factor i utilized in sector j, σ is the elasticity of substitution between

K and L, which we have assumed to be constant across the sectors for simplicity, $\delta_{ij} = \lambda_{ij}\theta_{kj}\sigma$ $(k \neq i)$, and $\varepsilon > 0$ is the aggregate elasticity of labor mobility (defined as the proportional change in the ratio of labor allocations per proportional change in the wage ratio).

In this model factor prices are not independent of production levels, hence we must solve the full system simultaneously. To proceed we use (6) and (7) to eliminate $\hat{w}_X$ and $\hat{w}_Y$, respectively. The remaining equations can then be expressed in matrix form as:

$$\begin{bmatrix} \lambda_{LX} & \lambda_{LY} & \Delta \\ \lambda_{KX} & \lambda_{KY} & -\sigma \\ -1 & 1 & (\varepsilon-\sigma)|\theta|(\theta_{LX}\theta_{LY})^{-1} \end{bmatrix} \begin{bmatrix} \hat{X} \\ \hat{Y} \\ \hat{r} \end{bmatrix} = \begin{bmatrix} \delta_{LX}\theta_{LX}^{-1} \\ -\lambda_{KX}\sigma \\ \theta_{LX}^{-1}(\theta_{KX}\sigma-\varepsilon) \end{bmatrix} \hat{p} \tag{11}$$

where $\Delta = \delta_{LX}\theta_{LX}^{-1} + \delta_{LY}\theta_{LY}^{-1}$ and $|\theta| = \theta_{LX}\theta_{KY} - \theta_{KX}\theta_{LY}$. Solving for $\hat{r}$ we obtain:

$$\hat{r} = \frac{[\theta_{LX}^{-1}(|\lambda|(\theta_{KX}\sigma-\varepsilon)-\delta_{LX})-\lambda_{KX}\sigma]}{|\lambda||\theta|(\varepsilon-\sigma)(\theta_{LX}\theta_{LY})^{-1}-(\sigma+\Delta)}\hat{p} \tag{12}$$

where $|\lambda| = \lambda_{LX}\lambda_{KY} - \lambda_{LY}\lambda_{KX}$. We can then solve for the changes in wages using (6) and (7):

$$\hat{w}_X = \left[\frac{1}{\theta_{LX}} - \frac{\theta_{KX}}{\theta_{LX}}\frac{[\theta_{LX}^{-1}(|\lambda|(\theta_{KX}\sigma-\varepsilon)-\delta_{LX})-\lambda_{KX}\sigma]}{|\lambda||\theta|(\varepsilon-\sigma)(\theta_{LX}\theta_{LY})^{-1}-(\sigma+\Delta)}\right]\hat{p} \tag{13}$$

$$\hat{w}_Y = -\frac{\theta_{KY}}{\theta_{LY}}\frac{[\theta_{LX}^{-1}(|\lambda|(\theta_{KX}\sigma-\varepsilon)-\delta_{LX})-\lambda_{KX}\sigma]}{|\lambda||\theta|(\varepsilon-\sigma)(\theta_{LX}\theta_{LY})^{-1}-(\sigma+\Delta)}\hat{p} \tag{14}$$

Expressions (12)-(14) characterize the factor income response to changes in domestic prices. Suppose that X is capital-intensive, implying that both $|\lambda| < 0$ and $|\theta| < 0$. Then it follows from (12) that $\hat{r} > 0$ for $\hat{p} > 0$. In the limit, as $\varepsilon \to \infty$ (12) reduces to the familiar $-\theta_{LY}\hat{p}/|\theta|$. Similarly, it is easily established that in the limit we have $\hat{w}_Y = \hat{w}_X < 0$ for $\hat{p} > 0$. However, when labor mobility is restricted, $\hat{w}_Y$ and $\hat{w}_X$ will diverge. When labor is fully immobilized, we have $\hat{w}_X > 0$ and $\hat{w}_Y < 0$ for $\hat{p} > 0$, as in the specific factors model. Generally, then the consequence of imperfect labor mobility is a divergence in the factor price response to trade liberalization.

Now, to see how imperfect labor mobility impacts household welfare we need to develop expressions for the changes in welfare of individual household groups, and correctly map these onto changes in factor incomes and transfers. We start with the familiar balance of trade condition:

$$C_Y + p^*C_X = Y + p^*X$$

where C_j denotes aggregate consumption of good j, and p^* is the world relative price of X. This can be rewritten in terms of domestic prices as:

$$C_Y + pC_X = Y + pX + (p - p^*)(C_X - X)$$

where the second term on the RHS is tariff revenue. By rewriting GDP on the RHS in terms of expenditures on factors this becomes:

$$C_Y + pC_X = w_X a_{LX} X + w_Y a_{LY} Y + rK + (p - p^*)(C_X - X)$$

This expression in turn is amenable to a breakdown across households as follows:

$$C_Y^h + pC_X^h = \phi_{LX}^h w_X a_{LX} X + \phi_{LY}^h w_Y a_{LY} Y + \phi_K^h rK + \phi_t^h (p - p^*)(C_X - X) \quad \forall h \in \mathbf{H} \tag{15}$$

where C_j^h is consumption of good j by household h, ϕ_{Lj}^h is the ownership share of household h in labor employed in industry j (i.e., L_j^h/L_j), ϕ_K^h is the capital ownership share of household h, and ϕ_t^h is the proportion of tariff revenue that is transferred back to household h. Summing across all households, of course, yields the original identity. Totally differentiating (15) yields:

$$\begin{aligned} d\Omega^h = {} & \phi_{LX}^h w_X \lambda_{LX} L(\hat{X} + \hat{w}_X + \hat{a}_{LX} + \hat{\phi}_{LX}^h) \\ & + \phi_{LY}^h w_Y \lambda_{LY} L(\hat{Y} + \hat{w}_Y + \hat{a}_{LY} + \hat{\phi}_{LY}^h) \\ & + \phi_t^h [(C_X - X)(dp - dp^*) + (p - p^*)(dC_X - dX)] \qquad \forall h \in \mathbf{H} \\ & + \phi_K^h rK\hat{r} \\ & - pC_X^h \hat{p} \end{aligned} \tag{16}$$

where $d\Omega^h = dC_Y^h + pdC_X^h$ is the change in household consumption at constant prices, our measure of welfare. The expression can ultimately be reduced to terms depending on the trade elasticities and the change in the tariff schedule, but the above breakdown is sufficient for our purposes.

In the usual case (i.e., assuming that the Metzler paradox does not hold at our initial point), a reduction in the tariff will correspond to $\hat{p} < 0$. The third term in (16) captures shifts in the value of capital. With X capital-intensive, the sign of this term is negative, as established by (12). The fourth term represents the effect of the reform on tariff revenue. This has two components, a volume of trade effect, which is positive, and a terms-of-trade effect which is negative. The overall impact will depend on which effect dominates. For tariffs that are relatively low (below optimal levels) the terms-of-trade effect will dominate, and this term will be negative. The last term shows the importance of consumption patterns, households that consume relatively large quantities of the protected good will benefit disproportionately from its liberalization.

The first two terms are of primary interest in explaining the impact of labor immobility. They show that imperfect factor mobility will affect households differentially based on both their ownership of labor, and the employment pattern in general. If labor is perfectly mobile, then the pattern of employment is of little consequence. The initial wage must be the same across activities and will rise in response to the liberalization, given the factor intensity assumptions. Households with large ownership shares of labor will benefit, irrespective of where it is initially employed.

What if households vary in terms of their ability to move across activities? If at least one household is unconstrained, and if that household is a large enough owner of labor to be able to absorb the required changes, then again the pattern of initial employment will not matter, it is of little consequence exactly who moves in this context. But, if the overall level of mobility is low across all households, or if the most mobile households do not own enough labor to absorb the shock, the initial distribution of labor takes on new significance, since the impact on wages in different activities will have to differ, resulting in differential household impacts.

This analysis suggests that when attempting to introduce imperfect labor mobility into representative household type models, we will need to think carefully about the mobility levels of different groups, and not just the initial factor ownership pattern, but also the initial employment pattern. This is an interesting area for future applied work.

7 Concluding Comments

In this paper we have used descriptive statistics and computable general equilibrium methods to assess the potential impact of trade reform under the Doha Development Agenda on the economies of South Asia, and compared the results with a potential regional trade agreement (SAFTA). Our model differs from others in the literature in that it isolates household level impacts for a diverse range of household groups across the region. The preliminary results suggest that, in contrast to the perceived wisdom, the distributional impacts of trade reform in South Asia are not likely to be biased against the rural poor in many of the economies. By contrast, in most of the economies the bias is against the urban non-poor. Future work will concentrate on improving the shock estimates and incorporating the market access effects. We have also proposed that imperfect mobility of labor may be a significant issue, and explored the theoretical implications.

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Table 1. Intra-South Asian Trade Shares 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
South Asia as Destination								
Bangladesh	8.69	9.04	8.90	9.72	11.30	9.39	9.72	8.31
India	2.04	2.47	2.67	2.75	3.26	2.68	2.58	2.40
Sri Lanka	7.12	7.57	7.79	10.35	12.67	14.33	15.08	17.74
Nepal	45.34	40.03	39.74	46.85	53.58	56.23	61.53	59.52
Pakistan	3.32	3.66	2.82	2.76	2.61	3.33	3.49	4.32
South Asia	3.81	4.25	4.08	4.29	5.04	4.29	4.06	3.94
South Asia as Source								
Bangladesh	0.74	0.88	0.89	0.88	1.15	0.85	0.64	0.54
India	1.83	2.08	1.84	1.99	2.25	1.90	1.79	1.80
Sri Lanka	0.56	0.59	0.59	0.70	0.84	0.75	0.86	0.74
Nepal	0.31	0.30	0.42	0.40	0.49	0.43	0.38	0.31
Pakistan	0.37	0.40	0.33	0.31	0.31	0.37	0.40	0.56
South Asia	3.81	4.25	4.08	4.29	5.04	4.29	4.06	3.94

Source: COMTRADE

Table 2. Intra-South Asian Trade Intensity 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
South Asia as Destination								
Bangladesh	8.54	9.00	8.68	8.92	9.34	7.54	6.93	5.92
India	2.00	2.46	2.60	2.52	2.70	2.15	1.84	1.71
Sri Lanka	7.01	7.54	7.61	9.50	10.48	11.51	10.76	12.64
Nepal	44.60	39.87	38.78	43.00	44.30	45.19	43.89	42.41
Pakistan	3.27	3.65	2.75	2.53	2.16	2.68	2.49	3.08
South Asia	3.75	4.23	3.98	3.94	4.17	3.45	2.90	2.81
South Asia as Source								
Bangladesh	7.54	8.16	7.82	8.26	10.20	7.66	5.97	4.80
India	2.64	3.08	2.68	2.63	2.63	2.12	1.72	1.73
Sri Lanka	6.56	6.84	7.50	9.31	10.98	10.29	11.55	10.25
Nepal	25.03	24.17	34.90	37.56	41.50	39.84	37.80	34.39
Pakistan	3.75	4.23	3.98	3.94	4.17	3.45	2.90	2.81
South Asia	2.88	3.31	2.48	2.21	2.04	2.39	2.36	3.31

Source: COMTRADE

Table 3. Intra-South Asian Trade Complementarity 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
South Asia as Destination								
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
South Asia as Source								
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

Table 4. Intra-South Asian Export Similarity 1999-2006

Region	1999	2000	2001	2002	2003	2004	2005	2006
South Asia as Destination								
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

Table 5. Trade Weighted Average Applied Tariffs in 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

Table 6. Poverty Profiles of South Asian Economies

$1/day	Year	Headcount (%)	Poverty Gap (%)	Squared Poverty Gap (%)	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 (%)	Squared Poverty Gap (%)	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)

Table 7. Household Categories in the Model by Region

Category	Pakistan	Bangladesh	India	Sri Lanka
H1	Large farm - Sindh	Agricultural landless	Rural self-employed agricultural	Urban low income
H2	Large farm - Punjab	Agricultural marginal land	Rural agricultural labor	Rural low income
H3	Large farm - other	Agricultural small land	Rural non-agricultural labor	Estate low income
H4	Medium farm - Sindh	Agricultural large land	Other rural	Urban high income
H5	Medium farm - Punjab	Non-agricultural poor	Urban agricultural	Rural high income
H6	Medium farm - other	Non-agricultural rich	Urban self-employed non-agricultural	
H7	Small farm - Sindh	Urban illiterate	Urban salaried	
H8	Small farm - Punjab	Urban low educated	Urban casual labor	
H9	Small farm - other	Urban medium educated	Other urban	
H10	Landless farm - Sindh	Urban highly educated		
H11	Landless farm - Punjab			
H12	Landless farm - other			
H13	Rural landless - Sindh			
H14	Rural landless - Punjab			
H15	Rural landless - other			
H16	Rural non-poor			
H17	Rural non-farm poor			
H18	Urban non-poor			
H19	Urban poor			

Source: Pradhan and Sahoo (2006), Fontana and Wobst (2001), Naranpanawa (2005), and Roland-Holst (2008)

Table 8. Household Welfare Impact of Trade Reform (US$ millions, EV)

	Pakistan	Bangladesh	India	Sri Lanka	Rest of South Asia
H1	4.6	3.5	$\boxed{-68.1}$	24.3	
H2	14.6	41.1	31.7	$\boxed{-8.3}$	
H3	2.5	$\boxed{4.1}$	30.6	10.8	
H4	14.2	-50.7	45.2	71.2	
H5	40.2	26.0	2.6	51.5	
H6	15.0	$\boxed{1.6}$	69.7		
H7	12.3	-17.7	144.2		
H8	52.1	8.2	15.3		
H9	8.6	-155.1	19.1		
H10	4.3	-138.8			
H11	5.2				
H12	1.6				
H13	0.4				
H14	$\boxed{0.5}$				
H15	$\boxed{0.0}$				
H16	12.5				
H17	1.9				
H18	-46.4				
H19	4.5				
Total	148.6	-277.8	290.2	149.5	205.7
Cumulative	7428.9	-13889.6	14508.9	7477.2	10283.0
Cum. as % of GDP	7.8	-24.8	2.3	37.2	74.0

Table 9. Sectoral Impact of Trade Reform (% Change in Production)

	Pakistan	Bangladesh	India	Sri Lanka	Rest of South Asia
Food grains	$\boxed{-0.2}$	0.0	0.0	-0.9	0.6
Other agriculture	0.3	-0.9	$\boxed{0.0}$	0.3	6.3
Forestry & fisheries	-0.1	-0.6	-0.1	0.3	2.4
Coal, oil, gas & other minerals	-0.8	-2.4	-0.2	11.1	-5.7
Processed rice	-1.7	0.0	0.0	0.4	-1.2
Other food	2.0	-0.7	-0.8	3.9	25.6
Textiles	$\boxed{0.1}$	3.9	0.9	-3.5	$\boxed{0.8}$
Wearing apparel	-3.7	15.3	$\boxed{-0.1}$	-11.0	-12.0
Leather	-3.8	8.3	-1.0	-2.5	-20.3
Wood products	-0.6	-1.4	0.2	7.8	$\boxed{-1.5}$
Chemicals, rubber,	-0.9	-0.4	0.4	1.1	15.6
Metals & minerals	-0.6	-3.0	$\boxed{-0.1}$	30.1	30.5
Metal products	-10.3	-5.0	0.3	16.1	-2.3
Heavy manufactures	-1.3	-1.7	0.2	14.6	-15.7
Manufactures NEC	-2.2	-2.9	-0.5	-13.5	-3.2
Services	-0.1	-0.5	0.0	-0.6	-1.4