Fluctuating staple prices and household poverty in India

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Abstract

The general perception is that high food prices in India have increased poverty and that trade reforms will further worsen poverty. We compare Foster-Greer-Thorbecke poverty measures for various scenarios of grain price swings with and without trade reform, using price and income effects for 32 representative households computed from a global economic model and a model of India's economy. The results suggest that a rise in the global rice price actually provides strong opportunities for poverty alleviation. Global trade reform reinforces this effect for all rural population groups. An increase in urban poverty partly offsets the overall poverty reduction. While India's trade measures effectively isolate sectors from swings in global markets, they also cause India to miss opportunities to benefit from buoyant global prices.

Acknowledgement

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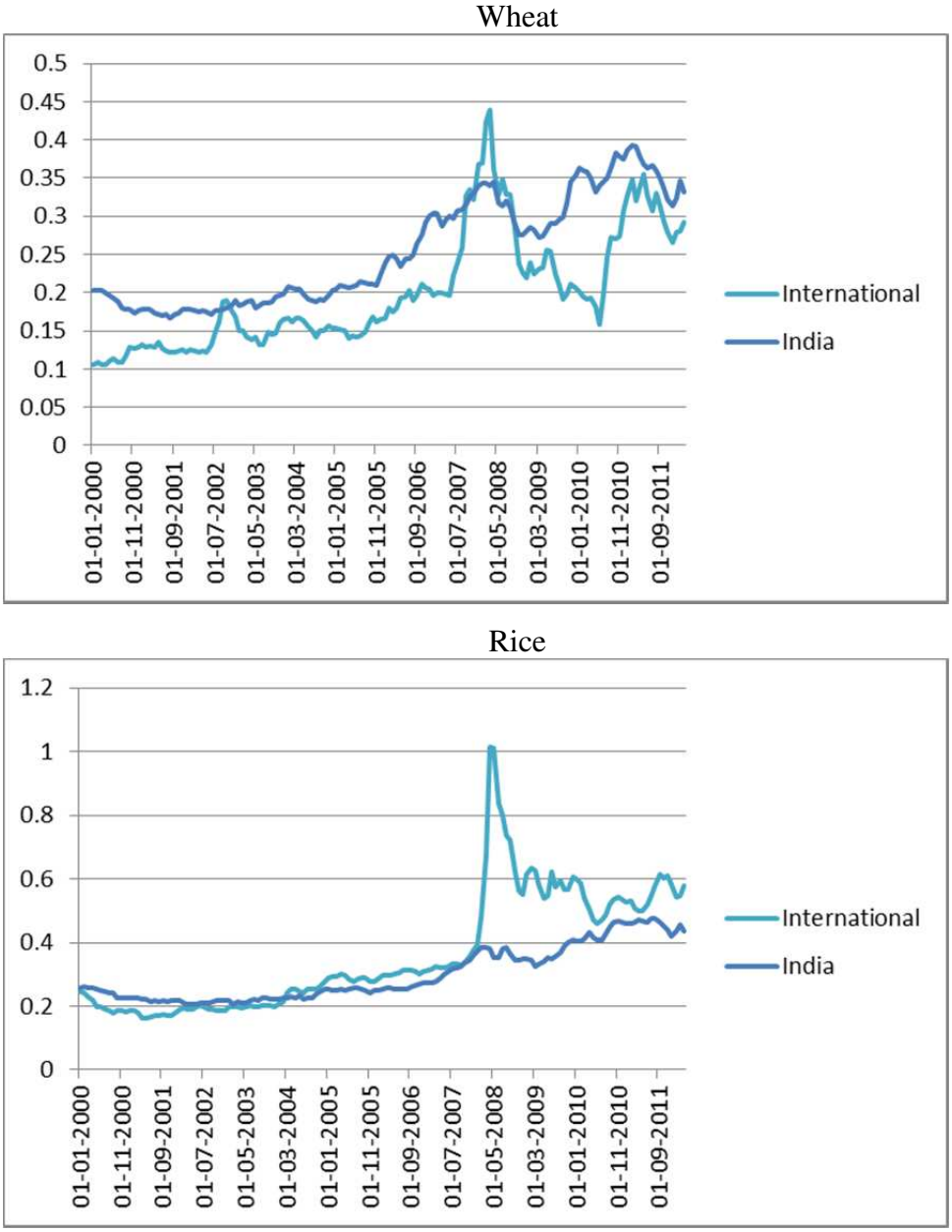
1. Introduction

Since 2000, food prices have climbed in India, leading to concerns among India's policy-makers (Dasgupta, Dubey, and Sathish 2011). Paddy rice and wheat are important food crops in India and rising wheat and rice prices harm poor net-consuming households that spend a large share of their household income on food items.

Figure 1: wheat and rice prices in world markets and in India from 2000 to 2012 (in USD/kg)



The government of India has repeatedly taken domestic countermeasures in response to world price changes for staple crops in order to shield domestic

markets from price fluctuations; particularly in the global markets for rice and grains. For instance, India imposed a four-year ban on wheat exports, which was withdrawn in September 2011. In 2007, the Indian government introduced a series of restrictions on non-basmati rice exports and banned rice exports completely in 2008. Figure 1 shows that India has been successful in shielding Indian prices from major fluctuations on the world market, but has not been able to prevent domestic rice and especially wheat prices from rising in the past decade.

India's trade policies have the effect of depressing domestic price levels whilst building up stocks. Conversely, when global grain prices were severely depressed, as was the case in 2000 for wheat and 2001 for rice, the Government of India used its system of minimum support price (MSP) as a means of retaining strong producer incentives for the production of staple crops.

While the justification of this policy stance is rooted in historical and political developments that trace back to the recurrent food crises of the Bengal Famine of 1943 through to the 1960s, academics have also buttressed this policy with arguments for a closed agricultural economy. These have mainly been based upon the claim that price swings on thin world markets lead to food security risks to India. Shielding the agricultural sector from world markets would therefore provide a level of protection needed to achieve self-sufficiency in food, and at the same time stabilize incomes in rural households (Chopra 1981). However, the fact that India has achieved self-sufficiency in a state of net agricultural taxation or disprotection seems to disprove this claim (Gulati 1989; Gulati et al. 1990). Removing these disprotection measures would, under a framework of proper agricultural policies and operating factor markets, result in a positive supply response that contributes to food availability and rising producer incomes.

A further argument for at least a partial protection of Indian agriculture has been made by Polaski, Ganesh-Kumar, McDonald, Panda and Robinson (2008). They apply a global and a national CGE model for India to trade reform. Their main conclusion is that, from the perspective of maximizing national welfare, the government of India does better to engage in global trade reform than in bilateral deals, and is correct to seek special safeguards in a Doha agreement to protect the poor of India from the negative effects of changes in world prices in staple grains.

The purpose of the present paper is to assess the poverty implications of changes in world commodity prices with and without trade reform for vulnerable households groups in India. We extend the work of Polaski et al. (2008) along a poverty dimension by considering the impact on individual households, rather than the 32 representative groups identified by Polaski et al. Analysing the

distributional effects of trade reform is important because the effects are unlikely to be distributed equally with some individuals gaining from reform and some losing (Taylor and von Arnim 2005).

Through the use of Indian household survey data, we evaluate the impact of the observed changes in household income distribution on individual household poverty as measured using the standard Foster-Greer-Thorbecke (FGT) poverty measures. We observe that many of the distributional results related to agriculture are closely related to the interaction of food demand and agricultural supply in response to a change in prices at the global level. The analysis shows that rural households stand to improve their position from trade reform more than urban households. This dichotomous result for rural and urban households reflects the interaction of farm and food prices resulting from India's intervention structure as captured in the national modelling framework.

The paper is organized as follows. In section 2, we provide a background, briefly reflecting upon poverty in India in relation to agricultural and economic reforms. We describe the methodology to evaluate the poverty impacts of changes in world commodity prices and trade policy in section 3. In section 4 we examine the impact of global market price for rice and wheat with and without trade reform on Foster-Greer-Thorbecke poverty measures and household groups. The conclusions of the study and an agenda for future research are presented in section 5.

2. Background

2. 1 Poverty and agricultural reforms

A major debate has revolved around the effects of economic reforms in general on growth in India and, in particular, poverty. Some see the reforms as having led to a reduction in poverty while others take the almost opposite view that poverty in the 1990s was exacerbated. The differences in views revolve around what the basic trends actually were according to the statistics, but this masks alternative perspectives on what the causal mechanisms of poverty reduction are.

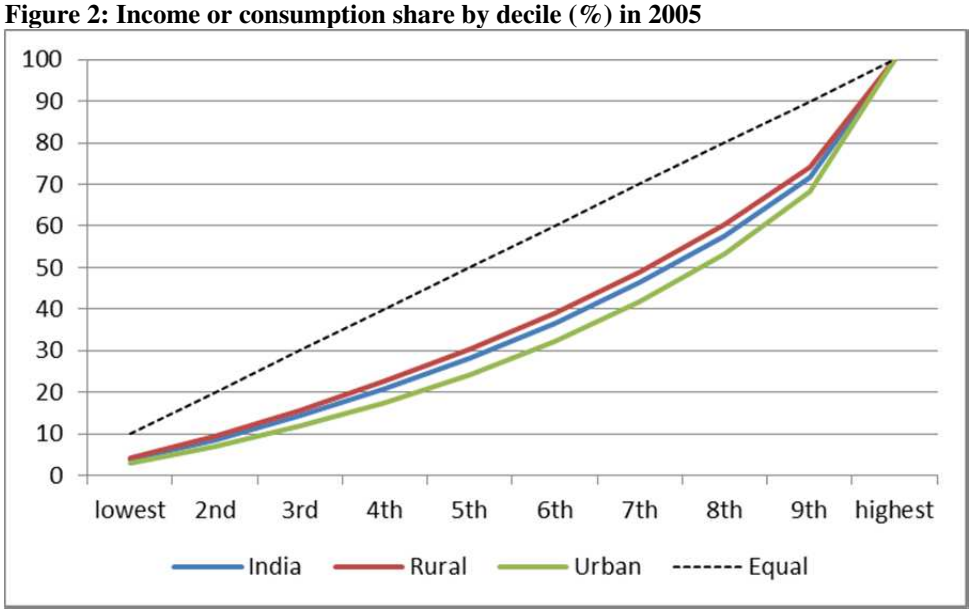
The statistics on poverty in the 1990s do not provide a clear picture of what has taken place[1]. According to the Planning Commission's estimates, the share of the population below the poverty line in India has dropped by 14 percentage

[1] The problems primarily concern changes in the questionnaire used in the Household Consumer Expenditure surveys of the National Sample Surveys Organisation (NSS) which leave open room for interpretation and subjective judgments concerning the comparability of data from before and after the changes.

points from 36% in 1993/94 to 22% in 2005/06 (Planning Commission and NSSO 61st Round). The analysis of World Bank economists Datt and Ravallion (2002) indicates that on average poverty, including rural poverty, has declined since the introduction of reforms, but that much of this decline seems only to be visible in 2000. On the whole they conclude that poverty has probably been declining at a little less than 1% per year during the 1990s. In particular, poverty reduction was present primarily in urban areas, and it seems even plausible that it actually has increased in rural areas. Even if poverty has not increased on average in rural areas, it has very likely to have increased in particular localities and among specific groups, which provides the basis for criticising the reform process and the neglect of the rural poor (see for example, Suri, 2006).

Figure 2 shows the income or consumption share by decile with urban income being distributed slightly more unequally than rural income in India. An overview of several poverty indicators for India is given in Table 1.

Figure 2: Income or consumption share by decile (%) in 2005



N. B. Based on estimated Lorenz curves. Households are ranked by income or consumption per person. Distribution are population (household size and sampling expansion factor) weighted
Source: PovcalNet: the on-line tool for poverty measurement developed by the Development Research Group of the World Bank' (http://iresearch. worldbank. org/PovcalNet/index. htm accessed 27 April 2012)

Table 1: Poverty indicators for India (rural and urban) in 1977-2009

Country	Year	Pov. line (PPP$/mo)	Mean ($)	Headcount (%)	Pov. gap (%)	Squared pov. gap	Watts index	Gini index	MLD index	Population (mil.)	Survey year
India*	1977	38	39. 17	65. 89	23. 22	10. 64	0. 33	35. 09	0. 21	652. 28	weighted
India--Rural	1977	38	37. 51	69. 02	24. 52	11. 26	0. 35	34. 2	0. 21	508. 65	1977. 5
India--Urban	1977	38	45. 07	54. 79	18. 61	8. 42	0. 26	35. 74	0. 21	143. 63	19
India*	1983	38	42. 76	55. 51	17. 24	7. 19	0. 23	31. 11	0. 16	750. 04	weighted
India--Rural	1983	38	41. 03	57. 78	18. 06	7. 57	0. 25	30. 06	0. 15	571. 38	1983
India--Urban	1983	38	48. 28	48. 25	14. 62	5. 99	0. 19	33. 33	0. 18	178. 66	1983
India*	1987	38	44. 84	53. 59	15. 81	6. 27	0. 21	31. 88	0. 17	819. 8	weighted
India--Rural	1987	38	42. 85	55. 6	16. 27	6. 43	0. 21	30. 13	0. 15	616. 65	1987. 5
India--Urban	1987	38	50. 89	47. 5	14. 43	5. 78	0. 19	35. 57	0. 21	203. 15	1987. 5
India*	1993	38	46. 68	49. 4	13. 56	5. 07	0. 17	30. 82	0. 16	928. 22	weighted
India--Rural	1993	38	43. 76	52. 46	14. 33	5. 36	0. 18	28. 59	0. 14	685. 4	1993. 5
India--Urban	1993	38	54. 91	40. 77	11. 39	4. 24	0. 15	34. 34	0. 19	242. 82	1993. 5
India*	2004	38	53. 49	41. 64	10. 51	3. 69	0. 13	33. 38	0. 19	1122. 99	weighted
India--Rural	2004	38	49. 93	43. 83	10. 66	3. 65	0. 13	30. 46	0. 16	802. 94	2004. 5
India--Urban	2004	38	62. 43	36. 16	10. 16	3. 8	0. 13	37. 59	0. 23	320. 05	2004. 5
India--Rural	2009	38	54. 96	34. 28	7. 53	2. 46	0. 09	29. 96	0. 15	847. 59	2009. 5
India--Urban	2009	38	73. 01	28. 93	7. 39	2. 61	0. 09	39. 28	0. 26	360. 15	2009. 5

a average monthly per capital income / consumption expenditure
b share of population living in households with consumption / income per person below the poverty line
c mean distance below the poverty line as a percentage of the poverty line
d mean proportionate poverty gap
e measure of inequality between 0 (everyone has the same income) to 1 (richtest person has all the income)
Source: PovcalNet: the on-line tool for poverty measurement developed by the Development Research Group of the World Bank' (http://iresearch. worldbank. org/PovcalNet/index. htm accessed 27 April 2012)

There is a paucity of knowledge regarding the likely effects of recently adopted or contemplated 'reforms' on the regulation of the agricultural sector in India. Recent review studies do suggest an attitude of critical scepticism towards a perspective that argues that the agricultural sector (having averaged annual growth rates of about 2.5% over a half-century) is constrained by an inadequate incentive framework. Surely, market imperfections and 'government/regulatory failure' abound, but this does not imply that the removal of government regulations will lead to an improvement of the situation (see, for example, Harriss-White, 1996, p. 344). Analysis purporting to the contrary is typically based on a simplistic theory of markets, and rarely cognizant of the nature of differentiation and inter-dependence between market actors. This being said, it has also to be admitted that a reasonably concise and general account of alternative predictions of the effects of market liberalisation is lacking. This situation is even less clear if one is concerned not only about overall growth in the agricultural sector, but also about its poverty-reducing character.

The issue of trade liberalization and its impact on poverty in India has attracted the attention of several authors. We refer to Shutes et al. (2012) for a more complete literature overview. A first conclusion emerging from these studies is that the short-run impacts of trade liberalization on growth and poverty are different from the medium and long-run impacts. In the short-run, trade liberalization adversely affects both growth and equity resulting in a rise in poverty. Trade liberalization increases import competition in the manufacturing sector; affecting its output and hence incomes. Though agricultural exports rise following reforms, the rise in agricultural income is insufficient to offset the loss in manufacturing output. Reforms also result in a rise in agricultural prices particularly food prices, which hurts consumers especially the poor for whom food items account for the bulk of their consumption expenditure. In the medium and long run, reforms help to accelerate GDP growth through more efficient allocation of resources across sectors[2]; leading to a reduction in poverty. One of the growth enhancing channels operates through an increase in the real investment rate brought about by the fall in price of investment goods which occurs even when the nominal savings or investment rate remains same.

2. 2 Transmission of price effects of trade

The domestic price of an imported good such as rice or wheat can be altered either by a change in its world market price and/or a change in the tariff rate

[2] Growth dynamics are not accounted for in this type of modelling.

applicable to it. The first represents a change in the world economic situation while the latter represents a change in domestic trade policy.

For any good, when the domestic price of its imports increases, the demand shifts away from the imported good and in favour of the domestically produced good, resulting in a decrease in imports. The reduced import competition allows domestic producers to increase their price and/or increase output. The final equilibrium, however, depends on the price elasticities of supply and demand, and the substitution elasticities in the Armington transformation functions[3] (Armington, 1969). In a situation where the supply is more elastic than demand, the increase in domestic production in response to reduced import competition could actually exceed the increase in the demand for domestically produced goods. This could exert an downward pressure in prices in domestic market when import prices increase, contrary to expectations.

Note that in this scenario the domestic price of only rice or wheat imports are specified to rise, while that of all other commodities are kept fixed at the base levels. An implication of this specification is that the imports of all other commodities become relatively cheaper than rice or wheat which leads to a fall in the consumer price index.

3. Method to evaluate the poverty impacts of changes in world commodity prices and trade policy

There are several established methods for linking macro-level CGE analysis to micro level household impacts. These approaches range from distributive analysis to more complex methods including micro-simulation and models based upon Social Accounting Matrices with very detailed household accounts. Examples of micro-simulation analyses in which macroeconomic effects are transmitted to a detailed household model include Bibi & Chatti (2006) and Cogneau & Robilliard (2000). Studies that use extended Social Accounting Matrices that include surveyed households as the representative households include Chitiga & Mabugu (2006), Annabi et al. (2005) and Cororaton & Cockburn (2005). Cororaton & Cockburn (2005) discuss the merits of each method. The distributive approach is adopted in this paper and follows the approach of Shutes et al. (2012) linking the macro level computable general equilibrium analysis of Polaski et al. to poverty effects at the individual household level.

[3] The Armington elasticity represents the elasticity of substitution between products of different countries, and is based on the assumption that products traded internationally are differentiated by country of origin. The Armington assumption has become a standard assumption of CGE models.

3. 1 Distributive analysis

Distributive analysis entails adjusting the distribution of household expenditures to reflect changes at the micro level brought about by changes at the macro level which here include changes in trade policy and world prices. The distribution of household expenditures may be imposed (e. g. using a log-normal (De Janvry, Sadoulet & Fargeix, 1991) or beta distribution (Decaluwé et al., 2000)) or identified from survey data (Cororaton et al., 2005).

We use the distribution of actual household expenditures taken from the 1999/2000 National Sample Survey[4] in this analysis and estimate the distributions using a kernel density approach (Scott, 1992). The distribution of household expenditures for an example household (Scheduled Tribes with incomes in the lowest decile in the rural north of India) is shown as a density function in Figure 3. There is a clear clustering of expenditures around the rural poverty line (shown in red).

The poverty impacts of changes in world commodity prices and trade reform are evaluated by comparing the level and severity of poverty under each scenario with the base situation of each household group. The impact of each scenario is captured by distributive analysis in two ways: changes in the mean of the distribution of expenditures by household group and changes in the poverty line. The impact on poverty can therefore be identified by comparing the poverty levels before and after the macro changes.

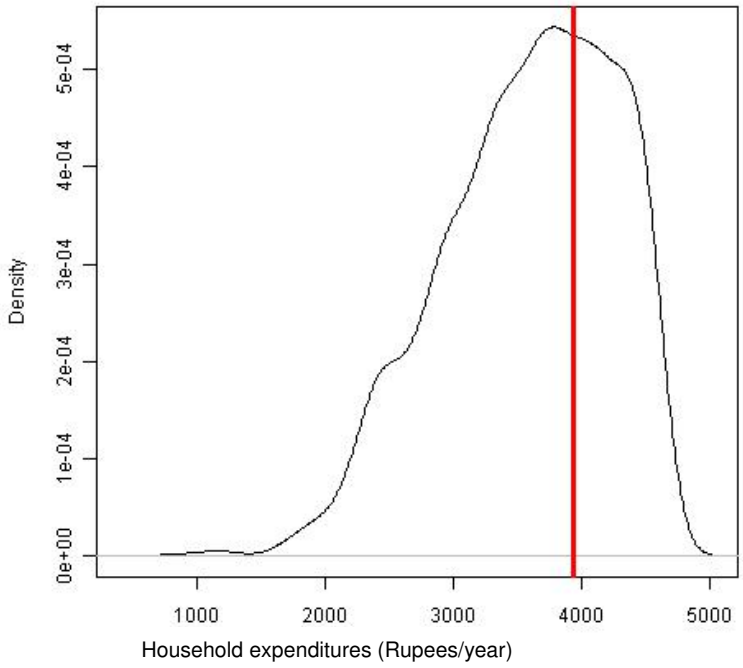


Figure 3 Example of a density function for household expenditures

[4] Survey data from 1999/2000 are used to maintain consistency between the household level data and the base year of the STAGE CGE model for India used in Polaski et al. (2008)

3. 2 Capturing Changes in Household Expenditures

The national Indian CGE model is a variant of the single country STAGE model (McDonald, 2006). The Indian model contains 32 representative households differentiated by location (urban, rural), population group (scheduled tribes, scheduled castes, other backwards castes and other) and income group (0-30%, 31-60%, 61-90%, >90%). The household survey data from which the actual distributions of expenditures are taken include 71268 rural households and 48821 urban households differentiated by region (North, East, South, West) as well as the other categories outlined above. The identification of household by region allows geographical inequalities in poverty changes to be identified as well as those brought about by location or social group. This is an important contribution for a country as diverse as India.

For each household group, the percentage change in mean household expenditure arising from the macro changes is applied to the distribution of actual per capita expenditures. This approach transmits the changes observed at the representative household level in the CGE model to the individual level and allows for poverty measures to be calculated for each scenario. This link relies on the established relationship that the expenditure of the representative household is the mean expenditure of all households; shifting the value of the mean therefore shifts proportionally the expenditures of individuals in each household distributed around the mean.

3. 3 Updating the Poverty Lines

Macroeconomic changes such as trade reforms and world price fluctuations are likely to have both an expenditure and a price effect. The expenditure effect is captured through the shift in mean household expenditures and the price effect through changes in the poverty line.

The official rural and urban poverty lines for 1999/2000 are 327 and 454 Rupees per person per month respectively. Annually, the poverty lines are 3924 Rupees per person for the rural population and 5448 for the urban population. As the simulations presented in Polaski et al. are counter-factual, price changes that affect the poverty line cannot be anticipated a priori, yet the updated poverty lines must reflect the changes in prices faced by households under each scenario. We construct household specific Consumer Price Indices (CPI) from the output of the STAGE model and use them to inform the changes in the poverty line that occur under each scenario.

The multiple households in the national model allow a sophisticated modelling of changes in the poverty line. A household specific CPI is constructed for each of the 32 representative households in the STAGE model using the formula,

$$CPI_h = \sum_c \left(\left(\frac{PQD0_c * QCD0_{c,h}}{\sum_c PQD0_c * QCD0_{c,h}} \right) * PQD_c \right)$$

where, following the STAGE model notation, *PQD* is the consumer price of each commodity faced by all households, *QCD* is the quantity consumed of each commodity consumed by each household and variables suffixed with a zero refer to base period values. The household specific CPIs are therefore weighted sums of consumer prices in each scenario using the value share of consumption in the base period as the weights. The official poverty line is updated using the percentage change from the base value in the household specific CPI under each scenario. In this way, the poverty lines are updated endogenously with the effects of each simulation.

Changes in poverty levels are attributable to three factors: changes in household expenditures, changes in the prices that affect the poverty line and the initial distribution of expenditures. Increases in mean household expenditure reduce poverty and indicated by a shift in the expenditure distribution however the real increase in expenditure may be less than the nominal increase if prices (and therefore the poverty line) are also increasing. Increases in the prices faced by households will, ceteris paribus, move more households into poverty as the poverty line shifts to the right. The initial distribution of expenditures also affects the impact of a reform on poverty; a small increase in real expenditure may lead to large reductions in poverty if there are many households subsisting on expenditures just below the poverty line. Similarly, the same change may have little effect on poverty if households are clustered far from the poverty line.

Together, the scenario specific changes in mean household expenditure and the updating of the poverty lines using the household specific CPIs allow the impact of trade reform and world price fluctuations on the Indian population to be observed and changes in poverty to be evaluated. The distributive approach has the advantage of being relatively simple to implement but also the disadvantages of simplicity: only the first moment of the distribution is changed in response to the policy change, and there are no feedback effects from the individual household level (e. g. through changes in the pattern of consumption demand) into the national CGE model.

3. 4 Measuring Poverty

The changes in household poverty are measured using the standard Foster-Greer-Thorbecke (FGT) poverty measures (Foster, Greer & Thorbecke, 1984). The FGT measures adapted for an expenditure-based poverty line are given by,

$$FGT_{\alpha} = \frac{1}{n}\sum_{i=1}^{p}\left(\frac{z - e_i}{z}\right)^{\alpha},$$

where n is the total population, p is the total poor population, z is the annualized expenditure-based poverty line, e is annual per capita expenditure and α is a sensitivity or 'poverty aversion' parameter. The survey data are weighted using the provided weights prior to calculating the FGT measures. Typically, three FGT measures are reported; evaluated at alpha equal to 0, 1 and 2. FGT0 is the headcount poverty measure which is the proportion of the population that has expenditure levels below the poverty line. FGT1 is the poverty gap measure which is defined as the extent to which the expenditure of the average household falls below the poverty line. FGT2 is the poverty severity measure which is the square of the poverty gap and gives more weight to poor individuals that are further from the poverty line.

The poverty measures are computed using R (R Development Core Team, 2009) using the RODBC (Ripley, 2009) and plotrix (Lemon et al., 2009) packages to manage database access and plotting respectively. The analysis produces headcount, poverty gap and poverty severity measures for the 32 poor household groups[5] in the base, trade reform and world price scenarios; giving a total of 960 poverty measures to comprehensive evaluate the impact of trade reform and world price fluctuations on the poor in India.

4. Results

4. 1 World price simulations

In this section, we simulate different world price changes and apply a distributive analysis. Four scenarios are first considered covering 25% and 50% price decreases and increases in rice and wheat without any trade reforms. Polaski et al. report that the distributional impact of an increase in world rice prices on Indian households is progressive: the poorest rural households see real income gains of 1.4 to 2.2 percent from a 25 percent price increase and gains of 4 to 6.4 percent from an increase of 50 percent, with the disadvantaged groups gaining most. The impact of a price increase on the incomes of urban households is more varied. Some poor households gain while others lose. The impact of increases or

[5] The survey allows for the identification of 128 household groups of which 32 contain households with expenditure levels below the poverty line.

decreases in the world price of wheat is more muted: increases in the world price of wheat produce very small gains for the poorest groups in rural areas and very small losses for other rural and all urban households.

Our analysis of the poverty effects shows an interesting asymmetry with regard to the global rice price (Figure 4 and Table 2). Poverty rates fall faster under rising prices than they increase under a fall in rice prices (compare the lower and the upper panel in Figure 4). Under a hypothetical 50 percent surge in the rice price, the rural poverty headcount comes down by 8.8 percentage-points. As discussed above, a higher world price for rice boosts real income in the farm household. It also increases purchasing power, given that food prices for consumers in India fall due to the perverse response of domestic rice supply to reduced import competition.

Under falling prices poverty rates increase in six out of eight household groups in the analysis. However, the scale of the poverty effects differ by household category, in particular across the rural-urban divide. We find, under a 50 percent drop in the global rice price, that the rural poverty headcount rises by 2 percentage-points, from 64.6 percent (base level) to 66.6 percent. Urban poverty rises twenty times less, by 0.1 percentage-points, to 55.3 percent. Under a 25 percent fall in the global rice price, the net rural poverty headcount increases by 1.2 percentage-points. Lower global rice prices appear to contribute proportionally to the deepening of rural poverty.

Compared to rural poverty, urban poverty is less affected under the staple price scenarios. The transmission of price effects and expenditure effects to the urban households is such that they either net out or do not affect the urban households at all.

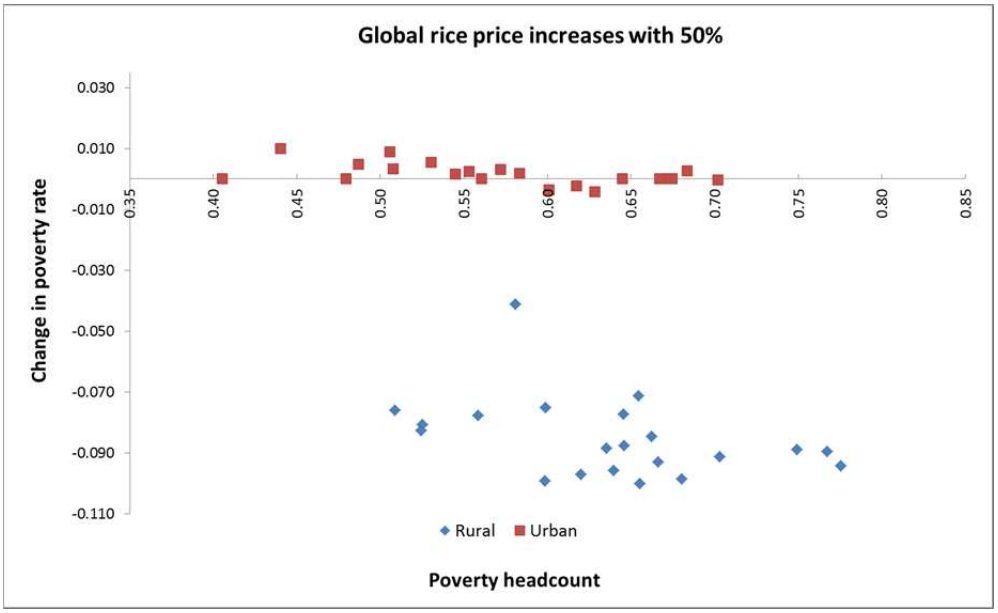
Table 2 Poverty effects under various scenarios on staple prices (change to base headcount rate in % points)

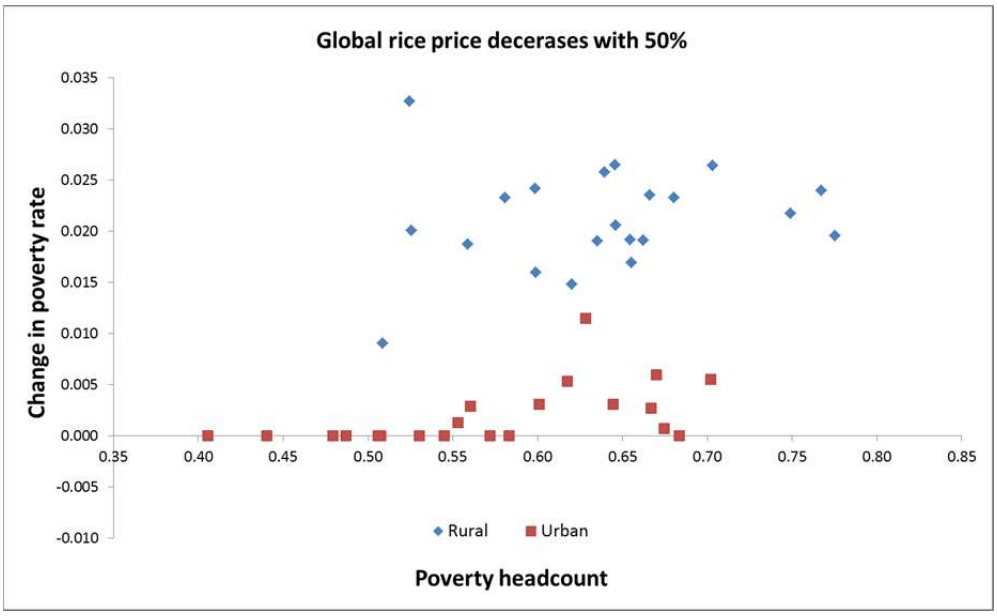
	Rice price				Wheat price			
	50% fall	25% fall	25% rise	50% rise	50% fall	25% fall	25% rise	50% rise
Rural	**0. 021**	**0. 012**	**-0. 034**	**-0. 088**	**0. 000**	**0. 000**	**-0. 005**	**-0. 006**
Rural Scheduled Tribes	0. 022	0. 015	-0. 033	-0. 089	0. 000	0. 000	-0. 005	-0. 005
Rural Scheduled Castes	0. 023	0. 011	-0. 038	-0. 093	0. 000	0. 000	-0. 004	-0. 004
Rural OBC	0. 019	0. 012	-0. 035	-0. 088	0. 000	0. 000	-0. 008	-0. 008
Rural Other	0. 019	0. 012	-0. 028	-0. 078	0. 000	0. 000	0. 000	-0. 006
Urban	**0. 001**	**0. 001**	**0. 001**	**0. 003**	**0. 000**	**0. 000**	**0. 004**	**0. 004**
Urban Scheduled Tribes	0. 003	0. 003	0. 000	0. 000	0. 000	0. 000	0. 003	0. 003
Urban Scheduled Castes	0. 005	0. 005	0. 000	-0. 002	0. 000	0. 000	0. 005	0. 005
Urban OBC	0. 000	0. 000	0. 000	0. 003	0. 000	0. 000	0. 003	0. 003
Urban Other	0. 000	0. 000	0. 003	0. 005	0. 000	0. 000	0. 003	0. 003

Source: model simulations and authors' computations

Positive effect Neutral effect Negative effect

Figure 4. Changes to poverty headcounts of households under increasing (A) and decreasing (B) rice prices in a situation without a Doha Agreement





Source: model simulations and authors' computations

De Janvry and Sadoulet (2009) also evaluate the impact of rising world cereal prices on India's poor. Despite considering similar size price increases, they find that it is the rural poor who lose out most from increasing cereal and edible oil prices. This finding runs contrary to the standard expectation that it's the urban poor who are most at risk from rising consumer prices and indeed to our findings. Several factors may account for the difference in conclusions between our study and that of De Janvry and Sadoulet. Firstly, they analyse the change in welfare from rising prices in a partial equilibrium framework which does not account for second order effects on household income from changes in demand patterns. Secondly, they consider farmer and non-farmer households whereas we consider household groupings based upon population group; indeed extending our household split to include a farmer/non-farmer would be an interesting area for future work. Finally, they explicitly account for home consumption of produced goods which is not included in the version of the STAGE model used for the Polaski study (cf Shutes et al. 2012), again this would be a useful extension of our analysis.

4. 2 World price simulations in a post-Doha world.

A second set of scenarios examines the poverty impact of the same price changes in global staple markets in a situation where India's trade policy is adjusted according to the commitments from a Doha agreement. We are interested in comparing poverty impacts under alternative price developments in a post-Doha world to a pre-Doha world. The difference indicates to what extent a Doha agreement renders the poor more vulnerable to price changes.

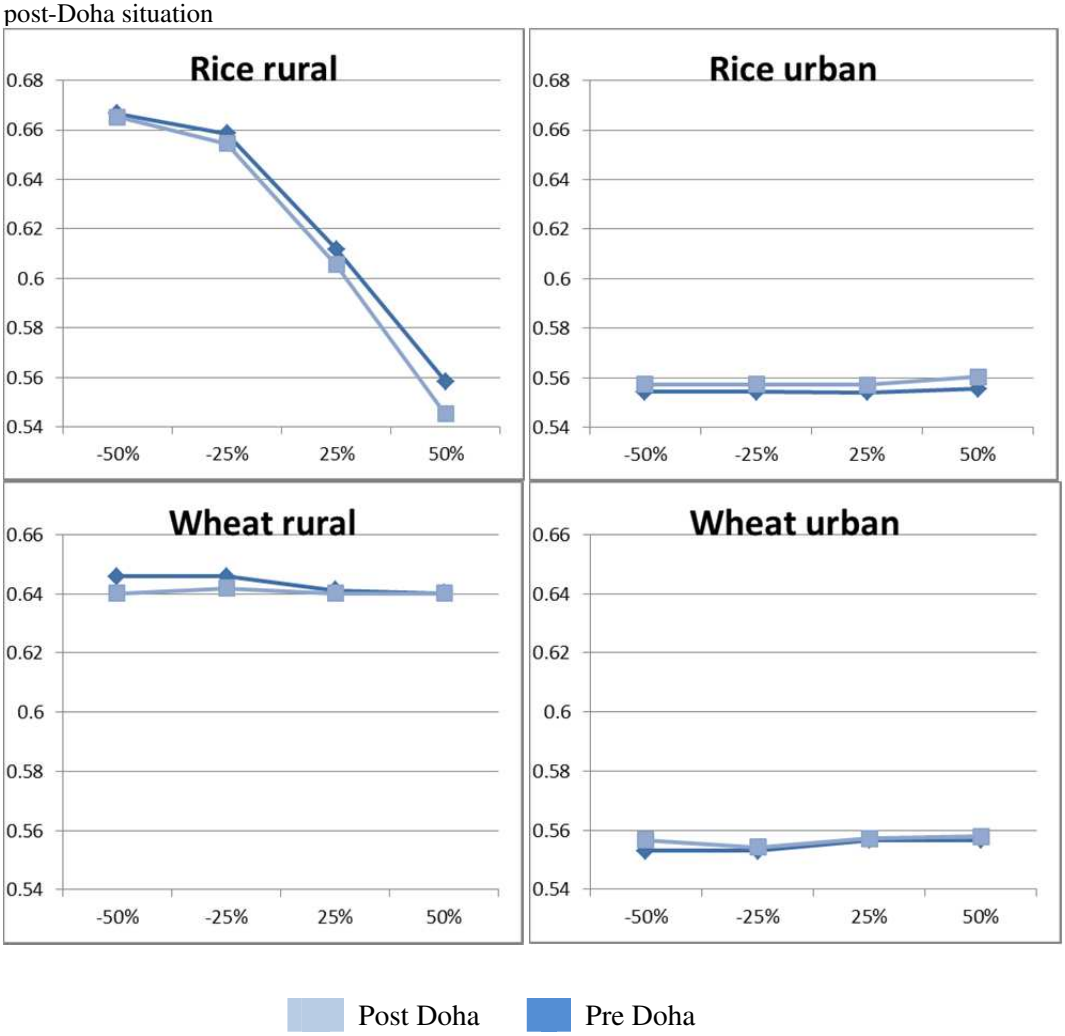
The results of this exercise are summarized at the aggregate level of rural and urban poverty in Figure 5. The diagram compares rural and urban poverty headcounts for two price decreases (m25 and m50) and two price increases (p25 and p50) in wheat and rice in a pre- and post-Doha world. The introduction of a Doha agreement improves the benefit to the rural population of a 50 percent increase in the world price of rice; reducing poverty by 10.1 percentage points compared to 8. 8 percentage points in a pre-Doha world. A Doha agreement does not prevent that a fall of 50 percent in the rice price leads to increased poverty but because of a partly offsetting Doha-effect, the poverty headcount rises 0.1 percentage-points less than in a situation without a Doha agreement in place. Post-Doha rural poverty rates lie strictly below the pre-Doha rates. In other words, a Doha agreement does not appear to worsen the position of the rural poor[6].

Urban poverty is barely affected by changes in world prices and the introduction of a Doha agreement. The results show a very slight deterioration in the position of the poor in a post-Doha situation.

Thus, our main result is that the positive effect of a Doha Round agreement on rural poverty is upheld under various market conditions. In a situation of rising staple prices, a Doha agreement further contributes to rural poverty alleviation. The Doha-induced contribution to poverty alleviation is however insufficient to completely offset rising rural poverty levels under falling world staple prices. While the scale of effects is limited, the position of the urban poor deteriorates more under a Doha agreement than under any of the price scenarios. Increased integration with the world market increases the opportunities for big wins but also big losses.

[6] This is not surprising as Doha reduces the distortions and therefore more of the world price reaches the producers, thus reducing poverty. It would be different if we were considering a shock with endogenous price effects. Then Doha might reduce the price increase of a shock which would mean less income for the rural poor. However, in this paper we consider a fixed 50% increase in prices which is unaffected by the introduction of the Doha agreement.

Figure 5. Rural and urban poverty under alternate staple market conditions in a pre-Doha and post-Doha situation



N.B. the y axis is percentage point difference – multiplied by 100
Source: authors' computations on various simulation results of Polaski et al.

5. Conclusions

When global prices for rice and wheat increase, domestic wheat and rice production becomes relatively cheap, which induces consumers to switch to domestic wheat and rice, increasing demand which will increase domestic prices. However, high global prices induce producers to increase their supply, and especially when exports are limited, as they are in India, this will put a downward pressure on prices. The overall net effect therefore depends upon the elasticities of demand of supply.

Our results suggest that price increases in rice and wheat, two major staple crops in India, reduce poverty for rural households through a positive impact on incomes, with a negligible effect on urban households. The effect is most pronounced for rice. Extending our household split to include farmer/non-farmer households to reflect net buyers of rice and wheat would be an interesting area

for future work. In addition, a useful extension would be to account for the home consumption of produced goods.

Analysing trade reform, we find that a Doha Round agreement under increasing world prices further contributes to rural poverty alleviation. Furthermore, a Doha agreement partly offsets rising rural poverty levels under falling world staple prices. While the scale of effects is limited, the position of the urban poor deteriorates more under a Doha agreement than under any of the price scenarios. Our results therefore qualify the necessity for special safeguards (such as imposing export bans): where these measures effectively isolate sectors from global markets, opportunities to benefit from buoyant global prices are missed.

The domestic (or inward) focus of India's political agenda poses a challenge to trade reform, particularly if there are concerns about negative consequences for poverty and food security. Future work may therefore extend the framework of the present paper to provide an analysis of possible countermeasures to redress adverse poverty effects. This would indicate to what extent India, while engaging in global trade reform under the Doha round, may be able to use domestic agricultural policies to control the livelihood risks and food-security threats at the household level.

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