

(Note: a completed paper will be available prior to the conference)

India's grain security policy in the era of high food prices: a general equilibrium analysis

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1. Background and introduction

Food grain production and consumption in India have been heavily influenced by government interventions with the overriding objectives being securing food grain self-sufficiency and providing/distributing subsidized food grains to its large population, much of which lives below official poverty line. While food grain self-sufficiency has been largely achieved through productivity growth and government assistance and interventions, hunger and malnutrition are still widespread among vulnerable groups and food insecurity remains severe among India's large poor population. At the same time, the fiscal costs of maintaining the various government interventions have been on the rise in recent years, especially during recent world food price crises.

To maintain domestic grain supply, the India government generally insulates its domestic market from the international market through higher border protections such as high import barriers and/or support for exports (or export restrictions when world market prices are high). Domestically, minimum support prices (MSPs) and central issue prices (CIPs) for key agricultural commodities have been used to fix prices at farm gate and consumer levels. In order to sustain the targeted MSPs, key agricultural inputs such as fertilizers and electricity are heavily subsidized. Public stockholding and state trading also play important role in regulating domestic demand and supply balance to achieve the goals of building a targeted level of public stock and of dispersing food grains through its targeted public distribution system (TPDS) to targeted poor consumers. On the consumption side, in recent years the TPDS has provided subsidized wheat and rice to poor consumers at the so-called central issue prices (CIPs), which have been kept artificially low and stable. Taking together, these border interventions, domestic production assistances, domestic market price interventions, and subsidies to consumers place a huge fiscal cost on the Indian government.

The high fiscal costs of these interventions have been further increased during the recent episode of high world market prices for food grains and for key agricultural inputs including fertilizers. For instance, a recent OECD paper (Jones and Kwiecinski, 2010) estimates the fiscal costs of India's policy in maintaining stable domestic food grain prices to about 19 percent of the country's fiscal revenue in 2008. This is because to curb the transmission of higher world market prices to the domestic markets, export restrictions had to be put in place. However, in order to compensate for the rising input costs, the MSPs also needed to be increased together with increased spending on input subsidies to partially offset the rising input costs. On the consumption side, higher procurement prices for the TPDS under stable CIPs implied much higher spending on providing subsidized grains to poor consumers. As such, the fiscal spending was ballooned as a result of higher world commodity prices.

While India's policy responses to the recent world food price crisis have been described and monitored at the international level (such as the OECD and the FAO), these responses have not been discussed extensively in domestic policy debates in India, probably because in India there seems to be considerable support for insulating border and domestic policy actions aiming at stabilizing domestic prices and at providing affordable food grains to the poor. In fact, recent debate in India has a narrower focus on elements contained in the newly introduced National Food Security Bill (NFSB). The NFSB introduced in 2011 aims at covering more around 70 percent of all Indian households in its subsidized food grains program. It is understood that this bill will not change the basic structure of India's food policy in terms of its insulating and price stabilizing nature. Instead, much of the debate is about whether the current TPDS system should be completely or partially replaced by cash transfers (CTs). Contentious issues in these debates are whether the proposed CTs would ensure better targeting, such as better inclusion of actual poor people identifiable by multiple criteria and exclusion of un-intended recipients; whether the CTs would increase actual access to food grains of the poor people; whether the CTs would fare better in eliminating/reducing leakages, wastes and corruptions which have plagued the TPDS, thereby improving the transfer efficiency; and whether the CTs would operate within a reasonable fiscal framework.

2. Objectives

In light of the above discussion, the objective of this project is to *estimate the welfare and fiscal costs of India's food security policy, with special references to the development and interactions of the various policy instruments used by India during the recent world food price crisis in 2007/8*. These include changes in India's import barriers and export restrictions, changes in its domestic grain market interventions such as the MSPs and CIPs and public stockholding, and changes in its spending on input subsidies, and the implied changes in subsidizations on the consumption side. The individual and joint effects of these interventions on the domestic (and the international) market outcomes will be identified and quantified; and based on the quantified effects, the fiscal costs and welfare implications of these policy interventions aiming at maintaining food security will be computed and illustrated. With these quantified estimates, we hope to shed some light on the real economic costs/benefits of India's food security policy as well as on illuminating potentially conflicting effects of individual policy instruments when these instruments are used in conjunctions with others. Since such broad perspectives have been largely missing in the current debate of the NFSB in India, it is hoped that the proposed analysis will contribute to a better positioning of the debate of India's food security policy.

3. Data, Methodology and Scenarios

The objectives of the project require detailed economic modeling of many different policy instruments influencing the production, stockholding, public procurement, international trade and consumptions of food grains, as well as the production and uses of key grain inputs such as fertilizers. In other words, both domestic and international markets of grains and key inputs have to be modeled. Moreover, consistent economic welfare analysis has to be conducted to evaluate the economic consequences of different and alternative policy instruments. As such, a general equilibrium modeling approach is preferred for the proposed project.

To realize this objective, we adopt and modify the global CGE modeling framework and database nicknamed GTAP to carry out numerical analysis. Significant changes to the standard GTAP modeling structure will be made to accommodate the observed policy measures by India and characteristics of the Indian agricultural economy.

Data on India's policy measures are gathered from various recent policy reports and publications from the India government, other public agencies and international organizations, as well as academic sources. Central to the purposes of this paper are India's domestic support policy on grains, mainly on wheat and rice. The Global Agriculture Information Network (GAIN) reports on India provided by the Foreign Agriculture Service of the US Department of Agriculture (USDA-FAS) offer annual accounts of India's grain production, consumption, trade, and stock situations as well as government support price for grain procurement and central issue prices for grain distribution under the TPDS. We rely on these reports as primary source of India's domestic policy on grains. Trade policy practices by the India government in recent years have been surveyed in a number of studies by several international organizations, such as an FAO report on policy responses to the world food price crisis (FAO 2008), and an OECD working paper on policy responses in emerging economies to commodity price surges (Jones and Kwiecinski 2010) which contains details on India's domestic and trade policy changes in 2007-8. Another OECD publication (2009) also provides discussions on other aspects of India's agriculture domestic support policy, such as various input subsidies on fertilizers and electricity. We use information from this source and data gathered from various other sources (such as the World Bank's agricultural distortion data base on India (Pursell, Gulati and Gupta 2009), the IFRPI's shadow WTO agricultural domestic support notifications on India (Gopinath, 2008), and several recent journal articles) to develop a complete picture of India's input subsidy programs.

The gathered policy information will then be integrated into the modified model and the actual "size" of the instruments will be calibrated into the accompanying database. In addition, additional sectors will be created in the model and database to accommodate important subsidies to key agricultural inputs. In this case, fertilizer and electricity subsidies are important instruments adopted by the India government. Therefore, we will use a GTAP database program named SplitCom (Horridge, 2008) to create a new fertilizer and a new electricity sector in our aggregated GTAP database to facilitate the analysis on the effects of these subsidies on their uses in agriculture.

The effects and the interactions of the various food security policy measures of India will be examined through a series of counterfactual simulations with the modified GTAP model. We base these simulation exercises on the GTAP database version 8, which has 2007 as its base year and covers 129 countries/groups of countries and 57 sectors. For the purposes of the current project, the original database will be aggregated to a manageable size.

4. Anticipated findings and policy implications

The anticipated outputs from this analysis consist of a consistent set of food security policy instruments applied by India in recent years, a modeling framework and calibrated database with these policy instruments fully represented, and a set of numerical simulations that illustrate the welfare and fiscal costs of these policy instruments in general equilibrium with a global setting.

By estimating the true costs of India's food security policy and exploring the interactions of individual policy instruments in general equilibrium, we hope to offer some broader perspectives to the domestic policy debates in India which have so far been largely confined to the narrower discussion on reforming the TPDS system.

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