STAPLE FOOD SECTOR IN THE PHILIPPINES

PRESENTATION NOTE

1. INTRODUCTION

1.1 Competition reforms aim to increase welfare by making quality goods and services available to consumers at lower costs. Competition in input markets brings costs of inputs (means of production) down and can furthermore help producers minimize their cost of production. Further, efficient output markets can provide producers better margins. This elucidates how competition can enhance producer welfare as well. Competition reforms include government policies to reduce barriers to entry, a regulatory framework towards fair competition, established by competition regulation and effective enforcement mechanisms. Such reforms, by offering a predictable set of rules for leveling the playing field, are pro-business.

1.2 In the case of staple food in The Philippines, the potential benefit for consumers from affordable prices and wider variety can be significant, particularly for poor households. The **Diagnostic Country Report** (DCR) of the CREW project aims to assess the impact of the state of competition (policy and practices) on producers and consumers of the rice industry (rice value chain) in The Philippines. The DCR is the output of the first phase of a study under the project titled "Competition Reforms in Key Markets for Enhancing Social & Economic Welfare in Developing Countries" (CREW Project). CUTS is implementing the CREW Project with the support from DFID (United Kingdom) and BMZ (Germany) facilitated by GIZ (Germany). The Philippines is among the four countries where the project is being executed for staple food and passenger transport. The implementation of the project is being led in the Philippines by the Philippine Institute for Development Studies (PIDS).

The DCR aims to identify existing concerns of consumers and producers in the Filipino rice sector and propose market reforms to help address these concerns, and estimate benefits thereof.

1.3 More specifically its objectives are as follows:

  i)   Review trends in the rice sector in The Philippines, particularly policies affecting the market and competition in various components of the rice value chain;

  ii)   Describe the state of competition in the Philippine rice industry;

  iii) Assess the impact of past and current competition reforms (i.e. reforms enhancing

competition in the market) on consumers and producers, and based on this assessment make recommendations.

iv) Identify concerns (of consumers and producers) and assess the potential impact of reform measures that can help address such concerns

2. RICE POLICY AND SECTORAL REFORMS

The rice sector is regulated by the National Food Authority under a highly interventionist regime aimed at food security and price stabilization.

Presidential Decree No. 4 of 1972 established the charter of the National Food Authority or NFA (then called the National Grains Authority). The NFA was established to encourage grains production and productivity and assure a "fair return" on investment of producers. Its mandate is to maintain food security in staple cereals in times and places of natural or man-made calamity/emergency, as well as stabilization of staple cereal supply and prices. To do so it was given a broad set of powers, including:

- maintain a national buffer stock;

- procure and sell grain;

- monitor grain storage;

- seize stocks in case of hoarding;

- establish and enforce standards in grading, sampling, and inspection;

- register, license, and supervise warehouse, mills, and other businesses related to grains;

- control the importation of grains so as to maintain parity between domestic and world prices;

- control the export of grains.

For rice, the NFA does paddy procurement and storage. Its buying price of paddy rice is currently P17.40 per kg, above the prevailing price of about P16 – P17 per kg. The NFA maintains a buffer stock of about 15 days worth of national consumption at any one time, with a required inventory of 30 days on July 1 of every year.

Rice milling is outsourced; the NFA does sell milled rice under its distribution program. NFA rice currently sells at P26 – 28 through accredited retailers; compare this with prevailing retail prices of about P32 – P36 per kg. In 2010 – 2012, NFA rice distribution averaged 1.2 million tons of

milled rice per year.

Since 1995 the most significant reform in import policy was its compliance with WTO rules and decisions.

In 1995 the Philippines acceded to the World Trade Organization (WTO), particularly articles on conversion of quantitative restrictions (QRs) into equivalent tariffs (*tariffication*). However the Philippines obtained a Special Treatment for rice up to 2005, allowing it to maintain its rice QR. Nevertheless the country conceded a minimum market access, ranging from 30,000 tons in 1995 up to 224,000 tons in 2004. Volumes within the market access charged a maximum tariff of 50%. Upon expiration in 2005, the country negotiated and obtained an extension of its special treatment for rice up to 2012. In exchange the country raised its minimum access to 350,000 tons, of which 163,000 were in the form of country-specific quotas (CSQs) to Thailand, China, India, and Australia.[1] Currently the Philippines has applied for an extension of special treatment with the WTO up to 2017, in the meantime maintaining *status quo* in its import policy while approval is pending.

RA 8178, the **Agricultural Tariffication Act**, converted trade barriers into tariffs, in fulfillment of the country's WTO obligations. However RA 8178 specifically exempted rice; rather, it confers the NFA the authority to undertake direct importation of rice, or allocate the import quota among licensed importers.

The import quota is decided by the NFA Council, the governing body of the Authority, which is chaired by the Secretary of Agriculture. The import quota is decided upon recommendation of an Inter-Agency Committee on Rice and Corn, which evaluates the supply and demand situation to determine the country's import requirement.

An important competition reform in the country's importation policy is the shift to private sector importation beginning in 2008, which intensified in 2010 onwards. In 2008 the allocation to private importers was only 200,000 tons, of which only 76,000 was actually imported; total imports that year totaled 2.2 million tons. By 2011 the private sector (together with farmer organizations) was allowed to import 660,000 tons, 77% of that year's import quota of 860,000 tons. However the annual import quota is now restricted to the minimum market access owing to

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[1] In practice, the high prices of rice produced in these countries tend to limit the amount private importers actually avail under the CSQ scheme.

the self-sufficiency target of 100% by 2013, to be sustained up to 2016. In 2013 the import quota is 350,000 tons, of which 163,000 is to assigned to the private sector under the CSQs

The NFA also regulates a number of rice-related processing and servicing activities, namely:

- Mechanical Drying, Threshing, and other Post Production Equipment

- Transportation

- Milling

- Warehousing

- Manufacture of rice-based and corn-based products

- Grains Packaging

- Retailing/ Wholesaling

- Importing/Exporting/Indenting

Each of these activities requires a license from NFA, which is typically valid for a year and subject to renewal.

Competition regulation in the rice sector is guided by relevant provisions in the Constitution and the Price Act.

The 1987 Philippine Constitution states (Article XXII, Sect. 19): "The State shall regulate or prohibit monopolies when the public interest so requires. No combinations in restraint of trade or unfair competition shall be allowed." Since then the major competition reform enacted was RA 7581 or the Price Act of 1991. The Act aims at protection of consumers by stabilizing the prices of basic necessities and prime commodities, and enacts measures against undue price increases during emergency situations. Basic necessities include rice, as well as corn, and other foodstuffs. The Act criminalizes acts of price manipulation and combination, namely: hoarding, profiteering, and formation of cartels. The enforcement agency for the case of rice is the NFA.

3. BACKGROUND OF THE SECTOR BASED ON SECONDARY DATA AND PREVIOUS RESEARCH

For a suitable background on the rice sector, we need data on production trends, level of imports, and price, together with past studies. The information is compiled and analyzed in the

following.

3.1 Trends in the rice industry (1994 – 2012)

Domestic rice production has been increasing, due to both rising area and yield.

Since 1994 (the beginning of the official data series), paddy rice output has been increasing, with dips only in 1997 and 2010 due to the *El Nino* phenomenon (Figure 1). Current output is about 18 million tons, from 4.7 million ha of area harvested, or a yield of 3.8 tons/ha. Annualized growth in output since 1994 was 3.0%; source of growth was fairly evenly distributed between yield (1.6%) and area harvested (1.4%).

Figure 1: Paddy rice output, area harvested, and yield, 1994 - 2012
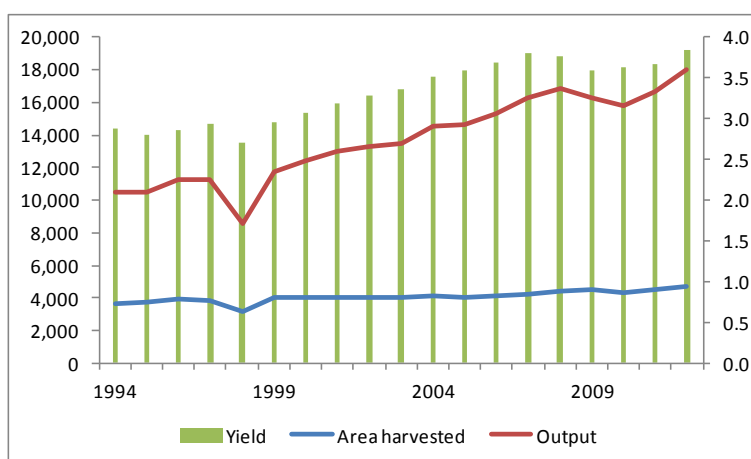
Large rice-growing regions in the Philippines are located in Luzon, e.g. Central Luzon and Ilocos Region.

Figure 2. Paddy production of Central Luzon and Ilocos Region
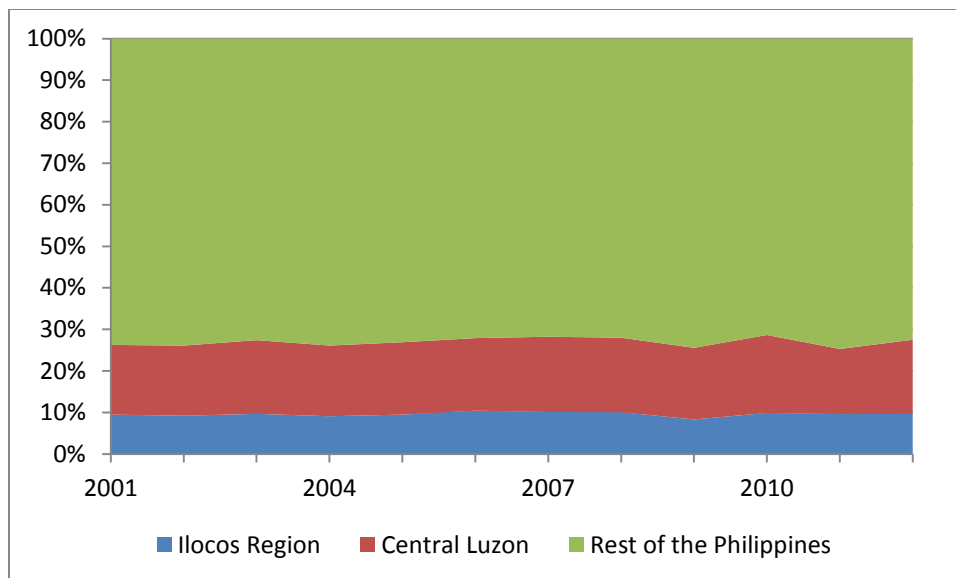
The increase in consumption has outpaced the growth in supply, leading to a growth in imports.

In 1994, domestic production of milled rice was 6.8 million tons, with nearly identical quantity of domestic utilization (**Error! Not a valid bookmark self-reference.**). By 2010 domestic production reached 10.9 million tons, while domestic utilization reached 12.4 million tons. In the long run the gap between production and utilization (supply and demand) must be bridged by imports, which have increased from an average of 0.4 million tons (1994 – 1996) to 1.6 million tons (2009 – 2011). This highlights the increasing importance of foreign supply in meeting domestic demand since the 1990s.

Figure 3: Milled rice output, utilization, and imports, 1994 - 2011
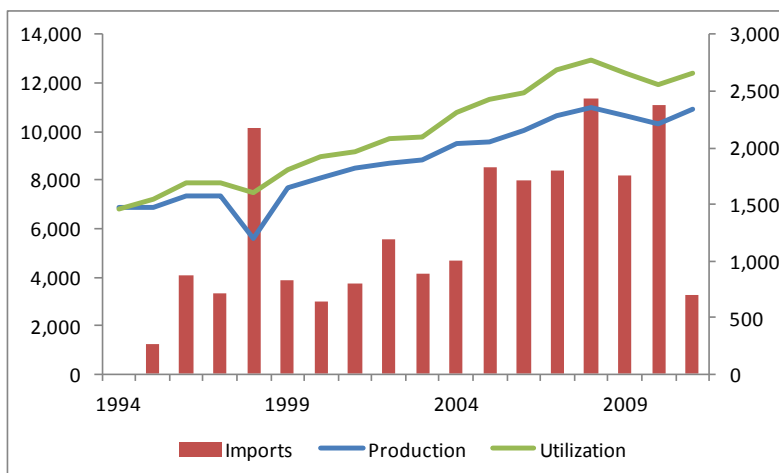
The domestic price on average has been higher than the world price.

Despite growing importance of imports, the domestic price of rice has been consistently above the border price. In Figure 4 the domestic price of rice is proxied by the national average wholesale price of well-milled rice; the border price is proxied by the landed price of *Thai White Rice* 5% broken, converted to peso using the market exchange rate. The average nominal protection rate (the difference between the border price and comparable domestic price as a share in the border price) is 45% The world rice price crisis of 2008 narrowed the gap between domestic and border prices; however since then the difference has reappeared.

**Figure 4: Monthly border and wholesale prices of rice, 1990 - 2011**
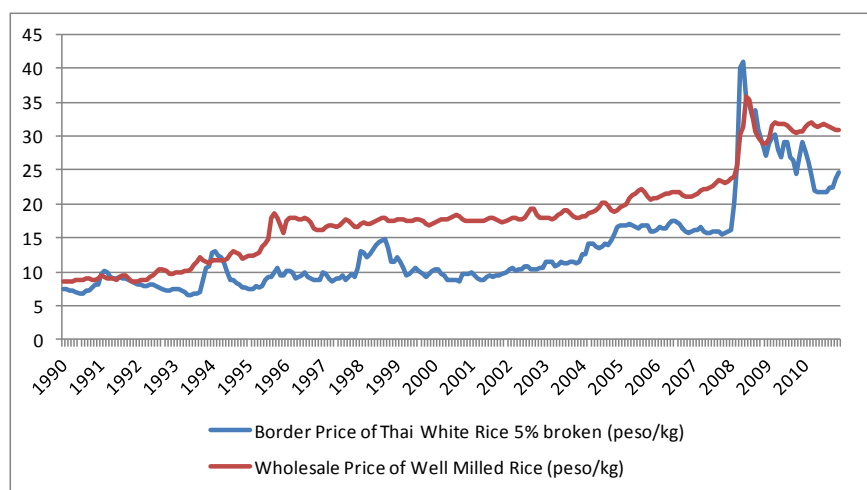
The price spread in the marketing chain is narrower at the retail level, compared to the wholesale level.

The rice marketing chain covered in this study is shown in Figure 5. In this study it is posited begins at the level of the farm, producing paddy (husked, or rough rice); there is of course a prior input distribution system, for which the state of competition is fairly well characterized (Box 1). It is important to analyse what measures have been taken in the input markets (e.g., fertilizer, seed, credit) to help producers of rice, especially the small farmers. Further, some of the concerns of producers in terms of access to these inputs would also be examined, and what measures could benefit them identified. Typically, the farm produce is sold to traders, who then

sell paddy rice to rice mills. Rice millers process the paddy into milled rice.[2] From the mill, the rice goes to wholesalers, who may also obtain milled rice from importers; rarely is rice imported in paddy form. Wholesalers then sell it to retailers, which in turn are divided into traditional retail outlets (rice sold in public or wet markets, or roadside stalls), as well as modern retail outlets (i.e. supermarkets and retail chains). The latter are often pre-packed and sealed, whereas the former are often sold loose.

**Figure 5: Schematic of the rice marketing chain**
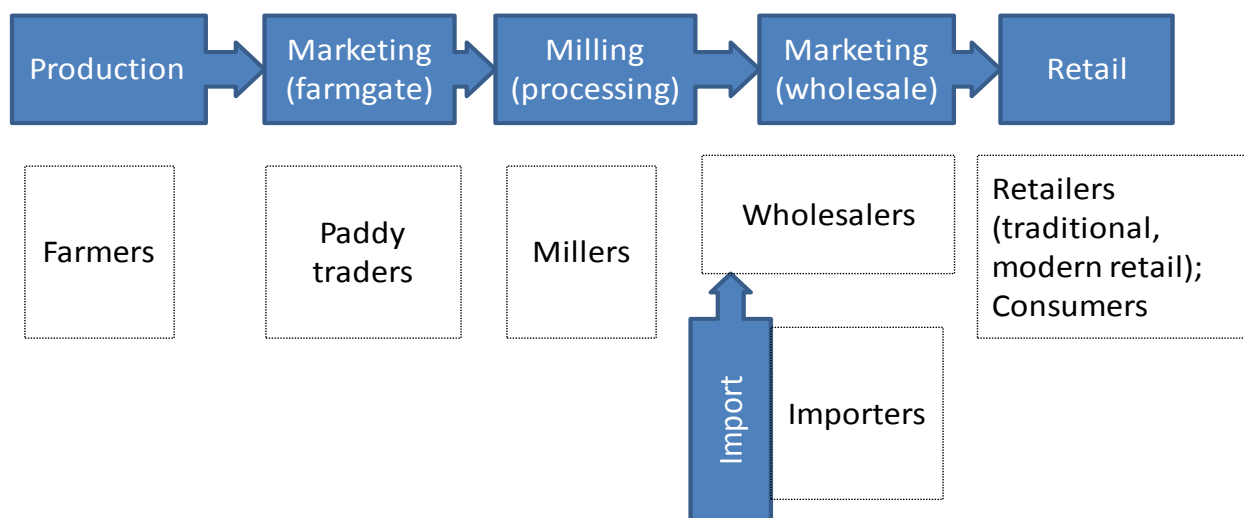
The trend in price at the paddy, wholesale, and retail levels are shown in Figure 4. The price spread (as a share of retail price) ranges from 6 to 8 percent at the wholesale-to-retail level; the price spread at the paddy-to-wholesale level is much wider, ranging from 40 to 44 percent. This is likely a reflection of higher costs along that segment of the chain, as it covers processing (e.g. processing cost and quantity adjustment for milled rice recovery) as well as assembly cost from paddy farmers to millers.

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[2] Typically white rice. A specialty market is milling into brown rice. A by-product of the milling process is rice bran which is used as animal feed supplement.

Figure 6: Paddy, wholesale, and retail prices, national averages
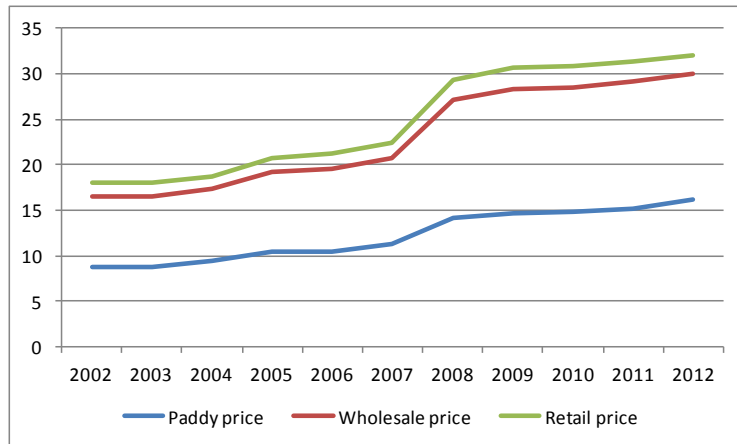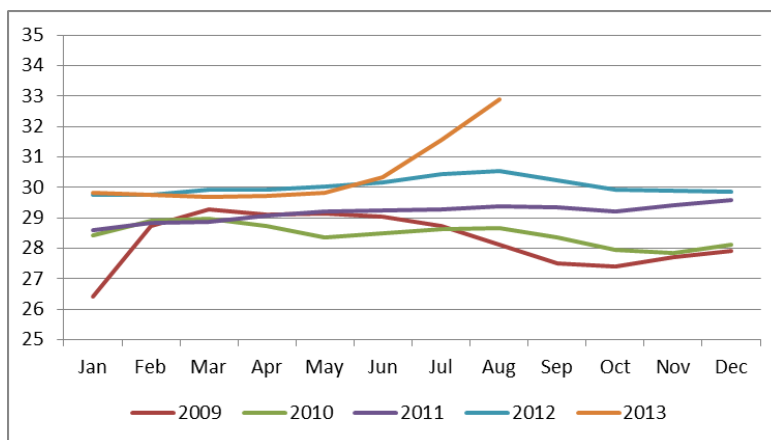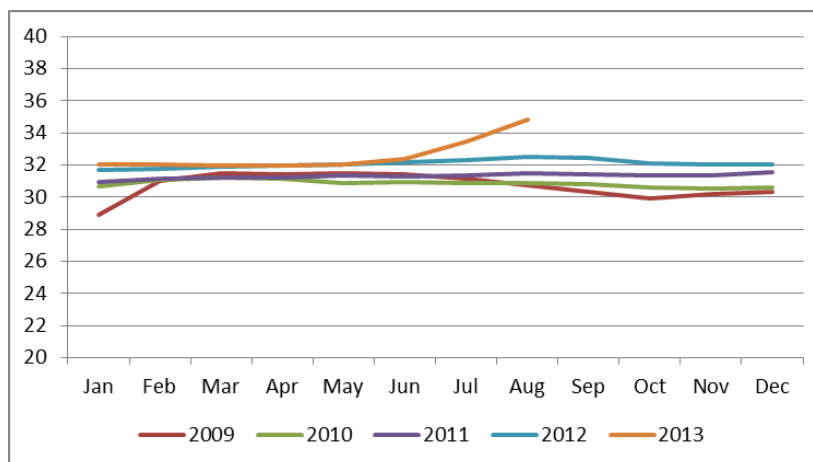

Source: BAS.

The wholesale price of regular milled rice has the tendency to increase during lean seasons (from July to September) as shown in Figure 7. On the other hand, as shown in Figure 8, a more stable trend is observed in the retail price of regular milled rice.

Figure 7. Monthly wholesale price of regular milled rice (in Pesos/kg)

Source: BAS.

Figure 8. Monthly retail price of regular milled rice (in Pesos/kg)

Source: BAS.

1 The rice marketing chain

Farmers acquire their means of production from relevant input markets.[3] There may be multiple layers especially between farmers and millers, working as consolidators, commission agents, independent traders, etc. Millers may also procure directly from farmers or sell to retailers; likewise wholesalers can be simultaneously importers and/or retailers. A large number of grains businesses apply for licenses every year; in 2012, the NFA licensed 69,140 grains businesses, earning fees of about P136.7 million (just under P 2,000 per license on average).

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[3] The draft DCR will contain a fuller characterization of the input distribution system, based on the final versions of the reviewed in Box 1. Given lack of resources, primary data will not be collected on the rice input system.

Box 1: The rice input system

The main variable inputs to rice production is fertilizer, agro-chemicals, and seed. According to BAS data, agro-chemicals account for less than 3% of total production cost; seed has a similar share, while fertilizer accounts for 10% of production cost. Only 29% of seeds is certified or hybrid seeds; the rest is "good seeds" (purchased but not certified) or farmers' own seed. Privately-bred seeds (distributed by large agribusiness companies) account for just 10% of all rice seeds (Sombilla and Quiloy, 2013). Meanwhile in the case of fertilizer, over 70% of domestic supply is sourced from imports. It can be shown that domestic and world prices of urea (the most important form of fertilizer) are integrated, in the sense that the margin between world and domestic price is mostly explained by marketing cost. The fertilizer distribution system is characterized by numerous players; as of 2009 there were 483 licensed handlers in the fertilizer industry, spanning importation, distribution, repacking, export, and manufacturing. Of these, 134 were listed as importers; 7 handlers were also listed as end-users (e.g. large plantations). Many more handlers are farmer cooperatives or associations (e.g. sugar planter organizations) who distribute fertilizer to their members (Briones, 2013).

3.2 Competition along the chain: domestic supply

Past research on rice industry shows a high degree of competition in the domestic market, from paddy production to retail marketing.

As early as the mid-1960s, Mangahas and Recto (1966) analysis of rice market found that price changes at one level of the marketing system are typically reflected, with little change in the marketing margin, at other levels. Market power if any is only transitory or of local significant. This was echoed in the analysis of Mears and Anden (1970), which shows that "hoarding" of palay or milled rice during the off-season does not necessarily create abnormal profit to the trader; when opportunity costs of storage are taken into account, both farmers and traders face a high probability of loss from holding paddy rice for sale after harvest. The astute trader may realize profit, but even an astute trader would have sustained losses in some years; it is unrealistic that a farmer with less familiarity and information could fare better.

In the mid-1980s, studies on rice marketing continued to emphasize recurrent themes of multiple market layers, numerous players, and the pervasiveness of government intervention. During that period, when the degree of self-sufficiency was greater than over the past decade, Umali and Duff (1992) found that there was a diversity of prices throughout the marketing chain, generally reflecting differences in grain quality. Competition in the private marketing system had been steadily increasing in rice retail, wholesale, and transportation sectors, as well as in warehousing. However, rice processing was not as competitive as government licensing has served as an entry barrier.

The authors also examined the issue of market integration, i.e. the degree to which trading activity arbitrages away differences in space or level of marketing, leaving only "pure"

(opportunity) costs of transport and marketing. They found that wholesale and retail levels of the market were integrated, although the degree of connection between farm and wholesale markets was much lower.

The integration result is consistent with that of symmetry of price changes found by Reeder (2000). Using official data on farmgate, wholesale, and retail prices, he finds that traders do adjust their prices upwards when cost increases; they are equally likely to pass on falling costs by providing price discounts. There is no evidence to support the view that traders over-react to unanticipated market news (i.e. of shortages); shocks tend to propagate from the farm level, to the wholesale, and then the retail level. Finally, Rufino (2008) finds that regional wholesale prices of regular milled rice are well integrated in the long run; moreover, even short-run deviations from long run equilibrium. In short the study could not confirm the existence of arbitrage opportunities, given the current state of the transportation system in the country.

A study from the mid-1990s (Bordado et al, 1996) compared the marketing of paddy rice by farmer cooperatives and traders in selected regions of the Philippines (Cagayan Valley, Central Luzon, and Southern and Central Mindanao). The study provides an excellent test of the hypothesis that market intermediaries are earning rents, that can be arbitraged by farmers who directly market their produce to millers or even wholesalers (i.e. taking over the rice milling themselves).

The study shows that the cost of marketing of PGs on average was higher than that of traders. The highest cost was in Bicol (P.48 per kg), which incurred considerable expense for cooperative overhead (i.e. manager's fee, commission for staff, and depreciation). The highest cost in Southern and Central Mindanao can be attributed to higher transport cost compared to traders.

Table 1: Marketing efficiency indicators, sample cooperatives vs. traders in selected regions of the Philippines, 1993

	Cooperative	Trader
Marketing cost (pesos per kg)	0.29	0.26
Buying price (pesos per kg)	4.88	4.79
Selling price (pesos per kg)	5.36	5.20
Margin (pesos per kg)	0.48	0.41
Return on investment (percent)	3	6

Source: Bordado et al (1996).

Cooperatives paid higher prices to farmers. They also obtained higher prices from its buyers this implies traders earn *lower margin* than cooperatives. The higher margin of cooperatives enabled them to earn a slightly higher profit despite higher costs (about P0.18 per kg more); in particular the village-based traders in Bicol and Southern and Central Mindanao realized "very low" profits. Nevertheless, traders earned a higher return on investment (ROI).

Hayami and Kikuchi (2000) conducted a reconnaissance of the marketing system in Laguna province in 1995 – 1997 from paddy procurement to retail. Their study revealed the "highly competitive" nature of rice marketing in the locality; countless middlemen compete in the procurement of paddy; these include small community-based collection, which virtually any villager can enter. These buyers compete with numerous rice mills; in one municipality (Pila, Laguna), as many as nine mills compete for paddy rice. These mills are also competing with other mills, not only in Laguna, but also in other provinces. Widening procurement area allows mills to obtain rice over different harvesting seasons and thereby avoid excess capacity; hence no mill, even large ones, exercises monopoly power. Intense competition is also observed between wholesaling of rice by mills to retailers, and in retailing to consumers.

The authors do observe long-term trade relationships between farmers and collectors, collectors and rice mills, and rice mills and retailers, often with credit tying; however such relationships are motivated by savings in transaction costs arising from possible opportunism, and reduction of risk, rather than exercise of monopoly or monopsony power. "Farmers, middlemen and consumers continue to maintain long-term trade relationships so long as it is beneficial to them, but it is very easy to switch trade partners if the present relationship is found to be unsatisfactory. Thus the market is highly 'contestable' if not perfectly competitive (pp. 204 – 205)."

The most recent study to use primary data traces the value chain from the farm to the wholesale level (Dawe et al 2008), comparing two similarly situated marketing channels in Thailand and the Philippines. The gross marketing margin in Thailand is much smaller ($16 per ton, compared to $67 per ton in the Philippines). Marketing costs are essentially equally to the gross marketing margin in Thailand, and is 55% that of the Philippines ($29 per ton). The most important source of the difference is the higher interest rate for working capital in the Philippines, accounting for 58% of the difference in marketing costs. Nevertheless the large difference in net margin implies excess profit in the Philippines. Tentative explanations for this excess profit include: problems of gaining access to working capital (preventing expansion of

operations of the most efficient millers and traders), large hidden costs of doing business in the Philippines (especially on a large-scale), and barriers to foreign investment (preventing the entry of the more efficient Thai investors).

Rather than "too few" traders, marketing inefficiency in the Philippines manifests in too many traders.

Tadem (2002) alleges that rice marketing in the Philippines involves a network of middlemen working closely with rice cartels which control 90% of the country's rice supply. The biggest is the "Binondo rice cartel" composed of Filipino-Chinese traders. Intal and ___ (2005), refer to a so-called "rice cartel" composed of seven Chinese families, associated with Binondo due to two streets in Chinatown characterized by a heavy concentration of large rice wholesalers in Manila. However, the existing literature debunks this view of a cartelized market.

Dawe et al (2007) note that allegation of a cartel is certainly not true between farmgate to the mill, or from the wholesale to the retail levels. In fact it is likely that large marketing margins are due to the existence of too many traders. It takes about 18 marketing agents (traders and millers) to process 90,000 tons of dry palay, compared to one miller in Thailand. As discussed above, the efficient traders/millers are unable to expand their operations, unlike those in Thailand.

The authors do concede that collusion may still occur among the "very large traders" who operate at the wholesale level. However they compare the marketing margin at wholesale-to-retail stage between Bangkok and Manila; while the latter is lower, the difference is only P0.33 pesos per kg of palay; adjusting for higher capital costs in Manila, the upper bound estimate of the excess margin due to collusion. Even if collusion exists, it exerts only a small influence on the market price.

NFA rice distribution has been effective in keeping domestic retail prices stable. However, the country's protectionist policy prohibits competition with foreign suppliers, keeping domestic prices significantly above retail prices.

Umali and Duff (1992) showed that government intervention had kept consumer prices low, putting the pressure on farmgate prices; however due to an insufficient resources and an unrealistically low floor price, government was unable to defend paddy prices. Market integration improved after 1983, after government reduced its role in the market. More recently

Yao et al (2007), using regression analysis, show that the NFA exerts only a mild influence on farmgate and retail prices at the national level, and exerts significant influence in only a few regions. Intal et al (2012), using a different regression model, on the other hand show that NFA distribution is able to contribute to price stability at the retail level. However they confirm that NFA procurement was unable to stabilize farmgate prices.

The reason is that NFA procurement accounts for only a small percentage of paddy production; but is a much bigger share of distribution. However while NFA has managed to stabilize somewhat consumer prices, its import monopoly has effectively kept domestic prices above the world price by preventing competition between domestic and foreign suppliers. In the 2000s the implicit protection rate averaged 45% (Briones and Parel, 2011). Partial equilibrium analysis by Roumasset (2000; cited in Cororaton (2005), estimates the excess burden of NFA operations (including its import monopoly) at P49 billion. Cororaton and Cockburn (2006) extend this analysis using general equilibrium analysis and find that a shift from the import monopoly to free trade has a net effect of reducing poverty, through a reduction in consumer price, despite the accompanying reduction in producer price.

3.3 Research hypotheses

Based on the preceding review, one may advance the following hypotheses:

1. *The rice market at the level of paddy trading and milled rice retailing is highly competitive.*

Consistent with this we expect to observe low barriers to entry, large number of players, little evidence of market concentration, and wide range of choice on the part of both buyers and sellers.

2. *There is some deviation from competitive behavior at the wholesale level for large urban center (Metro Manila).*

The rice marketing chain has been well studied. However there remains a lingering question over wholesale level collusion; the assessment of Dawe et al (2007) deserves corroboration. Note that if the market is already competitive, then competition reform may have limited impact on the market. Hence, analysis of the competition reform due to the price law or related laws (Section 2) are less useful compared to documenting the state of competition in the rice market. Nevertheless there seems to be no getting around the conclusion that any collusion has a limited effect on the price of rice, primarily due to the limited price spread between wholesaler and retailer. Nevertheless the study will attempt to document any deviations from competitive

behavior leading to an excess spread, without neglecting other potential implications of collusion such as lower product quality.

3. Protection of domestic suppliers from foreign suppliers presents a significant deadweight loss to the Philippine economy.

The biggest issue (gauged by the magnitude of the price wedge between domestic and retail price) is clearly the entry barrier that prevents free competition between domestic and foreign rice suppliers. These two competition issues are examined further in this DCR following methods described in Section 4.

4. NFA's price stabilization measures has been effectively implemented and helped to keep price of rice low at the consumer end.

NFA's functions including price stabilisation measures have helped infuse price competition and resulted in lower prices at the consumers end. Note that that "low" here posits a counterfactual with no consumer subsidy but nevertheless a regime of quantitative restrictions administered by NFA, i.e. NFA without a rice distribution program. (If the counter-factual is "no NFA", and trade policy is free trade or a moderate tariff, then the opposite would hold, i.e. NFA activity keeps the price of rice high at the consumer end.)

4.   PRIMARY DATA NEEDED

The study will need information about the rice market chain to be collected by rapid appraisal method and perception survey.

4.1. Rapid appraisal of the state of competition in the rice marketing chain

The study adopts the rapid appraisal method based on interviews of key informants. Informants will be selected from each of the nodes of the value chain, beginning at retail market in Manila, tracing it back to the biggest rice-producing province in the country, Central Luzon, 3 hours north of Manila by car. The nodes and expected number of respondents are as follows:

Metro Manila consumer   2 (encountered in retail market)

Metro Manila retailer: 3 (includes member of GRECON)

Greater Manila wholesaler: 3

Greater Manila rice mill: 3 (includes member of PHILCONGRAINS)

National Food Authority	1
Central Luzon rice mill:	1
Central Luzon wholesaler:	2
Central Luzon palay trader:	2
Central Luzon farmer:	3
TOTAL	20

Note: "Greater Manila" covers the National Capital Region and its surrounding areas accessible by day trip (e.g. Marilao, Bocaue, Calamba, San Mateo, etc.)

4.2. Perception Survey

To align the Philippine DCR with that of the other countries undertaking the study and gather primary data for the consumer welfare analysis, a perception survey will be implemented. The survey instrument will follow the CREW questionnaire for all countries.

The sample size for Metro Manila is 548 given the same formula adopted in other studies. As the population of Central Luzon (the source of paddy) is similar to that of Metro Manila (10.159 million versus 11.855 million of Metro Manila), the sample size for Central Luzon rounds off to the same number, which is 548.

5. COMPETITION WITH FOREIGN SUPPLIERS: EX ANTE ANALYSIS

To analyze the impact of opening up domestic market to foreign competitors, the study will develop a spreadsheet model for economic surplus analysis, called the Total Welfare Impact Simulator for Trade (TWIST). The model is derived from the Welfare Impact Simulator for Evaluating Research (WISER), described in Briones and Galang (2012). It follows the same framework in Roumasset (2000). The advantage of the tool is that it permits annually updated figures for calculating changes in producer surplus, consumer surplus, deadweight burden, quota rent, and tax revenue, given new baseline data (and possible elasticities of demand and supply).

For the purposes of this study, the model is applied to 2012 data. In creating the baseline data for the TWIST simulations, several data are needed, such as production quantity, price, tariff rate, import quota, world price, and other information about the **regular milled rice**, which is the

commodity of interest. All of these are obtained from credible references—official government statistics, and international institutions' databases.

The Bureau of Agricultural Statistics (BAS) is the main reference for the production data. It defines production as the total domestic production in the country, which is a combined quantity of commercial and backyard productions. This is usually measured in metric tons. The same source is used for the retail-level price of rice (pesos per kilo).

Other important variables in the model are tariff rate, import quota, and world price. The tariff rate applied in the model is taken from the Philippine Tariff Commission, which is currently 40 percent for rice. This is significantly higher than other commodities since rice is provided with special considerations under the Common Effective Preferential Tariff Scheme for the ASEAN Free Trade Area (CEPT-AFTA), and ASEAN Trade in Goods Agreement (ATIGA). However, the tariff rate is expected to decrease by 2015, from 40 to 35 percent, as closer integration is viewed among ASEAN countries.

In the case of the Philippines' import commitment to the World Trade Organization (WTO), the minimum access volume (MAV) is 350,000 metric tons annually. This refers to the volume of imported rice permitted to enter the country with a 40 percent tariff. Above the MAV, a 50 percent tariff rate is applied to rice imports. The import quota is solely decided upon by the National Food Authority through the National Food Authority Council, which is headed by the Secretary of Agriculture. In 2012, 500,000[4] metric tons of rice is imported. The model does not incorporate this partition in the imports. The model applies the tariff rate evenly on all imports.

The World Bank's Pink Data is used to get the average nominal world price of Vietnamese rice (5 percent broken) in dollars, which is considered as the freight-on-board (FOB) price. This is then converted to its estimated cost-insurance-freight (CIF) equivalent by dividing it by the computed ratio of FOB to CIF (0.95). The prevailing exchange rate for 2012 is adopted to transform the price from dollars to pesos.

Another important assumptions made under the baseline case are the elasticities of supply and demand. The researchers have assumed a conservative estimate of the supply elasticity, which is 0.5, and, -0.2 for the demand elasticity.

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[4] The BAS data reflects 1,007,000 metric tons of rice imports for 2012.

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