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# **Distortions to Agricultural Incentives in the Philippines**

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Agricultural Distortions Working Paper 28, December 2007

This is a product of a research project on Distortions to Agricultural Incentives, under the leadership of Kym Anderson of the World Bank's Development Research Group ([www.worldbank.org/agdistortions](http://www.worldbank.org/agdistortions)). The authors are grateful for helpful comments from workshop participants, for computational assistance from Ernesto Valenzuela, and for funding from World Bank Trust Funds provided by the governments of Ireland, Japan, the Netherlands (BNPP) and the United Kingdom (DfID).

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# **Distortions to Agricultural Incentives in the Philippines**

Cristina David, Ponciano Intal, and Arsenio Balisacan

The economic performance of the Philippines has lagged behind most other developing countries in Asia. Whereas the Philippine economy and its agriculture sector performed moderately well in the 1960s and 1970s, because of the early advent of the Green Revolution in rice and the world commodity boom, the country has had the lowest average growth rates in gross domestic product, gross value added in agriculture, and agricultural exports over the past two decades in South and Southeast Asia (Table 1).

Past studies have argued that the country's poor agricultural performance has been due largely to weaknesses in the policy and institutional frameworks governing the sector, and not so much to real domestic and external market factors (David 2003; Balisacan, Fuwa and Debuque 2004). Government price and trade policies have distorted economic incentives, and the choice of policy instruments used have promoted rent seeking and raised the economic cost of government interventions. The lack of market infrastructure, underinvestment in agricultural research, distortions in land markets due to the agrarian reform program, and other weaknesses in governance have all contributed to the poor performance of the sector.

The declining trend in tariff protection since the 1980s — through a series of unilateral tariff reform programs and multilateral and regional trade agreements — have been well-documented (Manasan and Pineda 1999; Aldaba 2005a and 2005b; Pasadillo 2006). All ex-ante impact assessments of the welfare impacts of trade liberalization using computable general equilibrium models consistently report positive effects (Habito and Cororaton 2000; Cororaton 2000; Clarete 1991). International studies, mostly using the GTAP model, likewise, show generally favorable results from trade reform. Yet after more than two decades of trade liberalization efforts, the country's economic performance did not significantly improve: per capita income continued to stagnate, domestic employment opportunities remained low, and poverty reduction lagged behind most other Asian neighbors.

Although the country appears to have become more open — as evidenced by the substantial rise in the ratio of the traded value of imports and exports to gross domestic product (Table 2) — that increase was not accompanied by an equivalent growth of gross domestic product. The rise in those trade openness indicators was primarily achieved through the rapid export growth of semi-conductors and electronic components with very high import content and low value added ratios. The growth rate of food and agriculture exports continued to drop, and the country's dependence on agricultural imports rose sharply (Table 2).<sup>1</sup>

There are several complex factors that might explain why the predicted impacts of trade liberalization have not been realized in the Philippines. One explanation, at least with respect to the agricultural sector, could be that the rate of trade liberalization as measured by the trends in average tariffs (typically used by both local and international analysts) do not accurately reflect the extent nor the direction of change in agricultural protection over the past several decades.

The objectives of this study are to quantify the trends and patterns of agricultural distortions from the early 1960s to 2004, and to explain the reasons behind those changes over time. In the next section, the historical patterns of agricultural performance and structural change are briefly described. The second section examines the evolution of both economy-wide and agriculture-specific policies that have distorted price incentives in the sector. The estimated impact of these policies on agricultural incentives is presented in the third section. The fourth section analyzes the reasons behind the evolution of policy choices, including the role of multilateral and regional trade agreements in the changes observed in recent years. Finally, we draw out the prospects for national policy reform: likely versus desirable policy direction through to 2020, implications for the trend level of distortions to agricultural incentives and for the choice of policy instruments, and policy lessons and consequences for other developing and transition economies.

## **Agricultural performance and structural change**

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<sup>1</sup> Real wages did not decrease only because of the acceleration of labor migration abroad. Migration increased foreign exchange earnings, with remittances now accounting for at least 10% share of gross national product.

Despite the relatively slow growth of the Philippine economy, the usual structural transformation in the course of economic development has taken place. The contribution of agriculture to the gross domestic product declined somewhat slowly from 1960 (30 percent) to 1980 (24 percent), and more rapidly in recent years (to 14 percent by 2004). This was accompanied by a steady decrease in the share of the sector in total employment from 61 percent in 1960 to 37 percent in 2000. The share has remained constant since then (Table 2).

Unlike the rapid industrialization that characterized the nature of economic growth among the so-called Asian tigers, however, the share of industry in the Philippines – which increased from 31 percent in 1960 to 39 percent in 1980 – has fallen back to the low 30s by 2004. Food manufacturing accounts for about 40 percent of the industrial sector, and half of this consists of light processing of rice and maize, sugar, coconut, livestock and poultry. Services have provided the highest contribution to gross domestic product and total employment. While growth in services was driven primarily by domestic demand for logistical support, trading and financial services, the rapid expansion of business process outsourcing in recent years is changing the nature and prospects for growth of this sector.

### ***Growth rate and composition***

The average annual growth rates of gross value added by major agricultural commodities were quite erratic over time. The crop sector grew rapidly prior to 1980, due to the Green Revolution in rice and the world commodity boom, but it performed poorly after that: the average growth rate was far below that of the population. This marked slowdown can be observed generally across commodities (Table 3).

Rice is the the main staple and the single most important crop in the Philippines. Whilst the growth rate of rice declined since 1970, it grew faster than population. It continues to receive the bulk of public expenditure for the crop sector, and it has also benefited from increasing price protection (see later). Imports of rice as a proportion of total supply have risen since the 1980s, reflecting the effect of increasing incomes and a shift away from maize as a food staple. Maize production experienced declining growth rates in spite of a rapid expansion of demand for maize as feed for the pigmeat and poultry industries, and despite rising price protection.

The poorest performers are the traditional export crops—coconut, sugar, abaca, and tobacco, each of which experienced a decreasing growth rate. By contrast, some non-traditional export crops — such as bananas, pineapples, and mangoes — experienced high growth rates. However, the crop diversification, particularly towards high-valued horticultural crops that raised the growth rates of the agricultural sector in Thailand, Chile and some other developing countries, was not so pronounced in the Philippine case.

Growth rates of livestock accelerated after 1980, their contribution to gross value added (GVA) rising from 18 percent to nearly 25 percent within just 25 years. That remarkable performance was due to increasing domestic demand as well as to productivity gains from the shift to larger-scale operations and the adoption of new technologies embedded in imported breeds, veterinary medicines, and feed ingredients.

### ***Agricultural trade and trade openness***

Agriculture has historically been a net foreign exchange earner, contributing nearly two-thirds of total exports and accounting for only less than 20 percent of total imports in the 1960s (Table 2). The sector's share in total exports dropped sharply to just 5 or 6 percent after the 1980s. By 2004, the agricultural sector had ceased to be a net earner of foreign exchange, as agricultural imports rose from about 30 percent of agricultural exports in the 1960s and 1970s to nearly 140 percent since the turn of the century. The relatively high growth rate of agricultural exports in the 1970s was due mainly to the world commodity boom and the expansion of non-traditional commodities (bananas, pineapples and fishery products) – but world commodity prices fell sharply in the 1980s and continued to be low until recently. Further, the growth of non-traditional agricultural exports leveled off by the 1990s. This is in stark contrast to the performance of neighboring countries, which experienced major export booms in cash crops even after the 1980s. For example, Thailand had dramatic success in rubber, Malaysia in palm oil, and Indonesia in palm oil and cocoa.

The composition of agricultural exports changed over the years in the Philippines. Coconut products continued to be the top foreign exchange earner, but its share decreased from nearly 70 percent of agricultural exports in 1970 to less than 30% in recent years. The contribution of sugar to agricultural exports, which was second only to coconut in the 1970s (30

percent), is now only 3 percent. The export value of bananas alone was about twice that of sugar; and this has been exceeded by exports of pineapples since the 1990s. Fruits and vegetables as a group now account for nearly 30 percent of agricultural exports.<sup>2</sup>

The rapid growth of agricultural imports stemmed from several factors. First, economic development increased demand for food products with higher income elasticities. Many of these products — such as wheat, milk and other dairy products, and beef — are commodities in which the Philippines does not have a comparative advantage. Second, livestock and poultry require agricultural inputs — soybean meal, maize, fishmeal and other feed ingredients — that are cheaper to import than to produce domestically. Third, agricultural modernization induced greater reliance on modern manufactured inputs that are mostly imported, such as fertilizers, agricultural chemicals, farm and agro-processing machinery, and veterinary medicines. Lastly, trade liberalization increased imports of previously highly protected agricultural commodities including fruits and beef.

There has been an apparent decrease in agriculture's trade openness as measured by imports plus exports as a percentage of gross value added (last row of Table 2). While agriculture was relatively more open than the rest of the economy up to the 1970s, the reverse has been true since then. This was due not so much to the reduction of imports to gross value added ratios (as these increased for both agriculture and non-agriculture sectors), but rather to decreasing export ratios for agriculture in contrast to the steadily rising trend for the rest of the economy. The declining trend in agriculture's trade openness in the 1970s and 1980s gradually reversed in the 1990s; but the rate of increase in the import ratios continued to be higher than its export ratios.

### *Comparative advantage and productivity trends*

The slower growth of Philippine agriculture compared to other developing Asian countries, and stagnation of agricultural exports, suggest that the country has been losing its former comparative advantage in the sector. Indeed, measures of revealed comparative advantage decreased sharply for agriculture as a whole, and for all major agricultural exports (Table 4). For

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<sup>2</sup>Fishery products, led by tuna and shrimps, have become major agricultural exports contributing about 20 percent of total agricultural exports in recent years.

example, the country's share of the world market in coconut products fell, and sugar began to be imported (as exports are limited to preferential access to the high-priced US market). Even for non-traditional exports, such as bananas and pineapples, the shares of Philippine products on world markets have declined since the mid-1980s.

The apparent loss in comparative advantage in agriculture is consistent with the reported trends in labor and land productivity indicators (David 2003). Both labor and land productivities increased up to the late 1970s, particularly during the Green Revolution period in rice. Whereas labor productivity for agriculture as a whole recovered after dropping sharply in the early 1980s, labor productivity in the crop sub-sector stagnated since then. Land productivity for the crop sub-sector grew slowly, particularly in the most recent period, with yields per hectare of traditional exports generally remaining constant or even declining. Higher growth in yields can be observed in rice, maize, and non-traditional exports such as bananas, pineapples and mangoes. Growth in productivity appears to have occurred in the livestock sector though, where international technology transfer, greater scale of operations, and other management-related innovations have increased production efficiencies significantly.

### **Historical evolution of price intervention policies**

Before estimating rates of assistance it is helpful to first describe policy trends since the 1960s, beginning with economywide policies and then turning to policies specific to agriculture.

#### ***Economy-wide policies***

An import substitution industrialization strategy dominated Philippine economic policies up to the late 1970s. The groundwork for this was laid by comprehensive foreign exchange and import controls that were instituted in response to the severe balance of payments crisis that occurred in the late 1940s, shortly after the country's political independence from the United States. The government's use of "essentiality" criteria in allocating foreign exchange and import licenses during the 1950s encouraged domestic production at the finishing stages of primarily



nonessential and semi-essential consumer goods, against backward integration for the production of raw materials, intermediate and capital goods. These policies defended an overvalued peso and thus clearly penalized exports and agriculture.

A tariff system was instituted as a decontrol measure in 1957. The system, however, largely preserved the biases in the incentive structure: tariffs depended again on essentiality criteria. Import duties were higher for semi-finished products as compared to raw materials and capital goods, and even higher for finished products. Moreover, quantitative trade restrictions continued to exist for substantial number of agricultural and non-agricultural products. Indeed, the subsequent balance of payments problem encountered in the early 1960s rendered tariff protection redundant as import and foreign exchange controls were predominant. Adoption of a multiple exchange rate system further penalized traditional agricultural exports.

In the early 1970s, a balance of payments crisis resulted in a major devaluation of the peso. By this time the high economic cost of the import substitution industrialization strategy and its detrimental effects on export potentials were being increasingly recognized. Nonetheless, the policy response was to provide industrial incentives directly through tax holidays and the like to selected firms, including exporting enterprises (Bautista and Tecson 2003). No attempt was made to modify the highly protective tariff system. In fact, tariff protection was raised on many import-competing products such as primary and processed food and agricultural products, chemical products, metal manufactures, electrical appliances and machineries, and transport equipment. During this period, the Philippines had the highest average tariff rate in Southeast Asia (Intal and Power 1991). In addition, the number of imported products (based on 7-digit PSIC classification) subject to quantitative restrictions rose from 26 percent in 1970 to 52 percent in 1980 (Bautista and Tecson 2003).

In the early 1980s, the government adopted various structural adjustment and stabilization measures to correct fundamental distortions in economic incentives and imbalances in the external and public sector accounts. These measures included trade policy reforms to remove quantitative trade restrictions and reduce the level and dispersion of tariffs, and liberalization of the foreign exchange market. The first of the unilateral trade liberalization programs, called TRP 1, was instituted in 1981 as a condition for a World Bank structural adjustment loan package.

Under TRP 1, the dispersion of tariff rates was to be reduced by lowering the peak tariff rates of 100 percent and 70 percent to 50 percent in two stages, and the very low tariff rates raised to at least 10 percent by 1985. Overall, the average tariff dropped substantially from 43 percent in 1980 to 28 percent in 1985. To complement the tariff reform program, import licensing was also to be gradually relaxed. From the original list of 1300 import items banned or requiring prior approval by the Central Bank and other government agencies, the plan was to remove these non-tariff barriers over three years — 264 items in 1981, another 610 in early 1982, and the remainder by end of 1983 (Bautista and Tecson 2003).

However, the balance of payments crisis of 1983, following Benigno Aquino's assassination, stalled these initiatives. The government again adopted comprehensive import and foreign exchange controls, making tariff reductions ineffective. Commercial banks were required to turn over their foreign exchange receipts to the Central Bank so that priority imports and other payments could be made. A 5 percent general import tax was imposed in November 1983 to generate government revenues and discourage imports; and this increased to 8 percent in April 1984 and then to 10 percent two months later. Additional export duties ranging from 2 to 5 percent were levied on traditional export products from November 1983 to December 1984, and an economic stabilization tax of 30 percent was levied briefly on all exports in 1984.

To curtail imports and capital outflows, the peso was devalued successively and in late 1984 the exchange rate was allowed to float. Tax reforms during 1983-85 gradually unified sales taxes on imports and import substitutes, removing one source of import protection. The mark-up rate (which increases the tax base for imports) on essential and semi-essential goods was reduced to a uniform 25 percent in 1985, and removed altogether in 1986.

Under the new government of Corazon Aquino, the trade liberalization program was revived in 1986. Export taxes on all commodities were abolished except for logs. The process of lifting import licensing was accelerated: 951 import items were liberalized in 1986, 170 in 1987, and another 209 products in 1988. Of the remaining 673 restricted import items, those on list A were scheduled for immediate liberalization and 94 of them were liberalized by the end of 1989, and those on list B were scheduled for further review. However, those on list C (numbering 114 items) continued to be restricted, for national security or health reasons.

The second unilateral tariff reform program (TRP II) was launched in July 1991 with the issuance of Executive Order 470. This EO was intended to reduce the range of tariff rates to 3 to

30 percent over a 5-year period. By the end of 1995, even though about 10 percent of the commodity lines were still subjected to tariffs outside the target range, the average tariff rate had declined from 33 percent in 1990 to 27 percent.

As part of the TRP II, EO 8 was also issued that converted quantitative restrictions of 153 agricultural products into their tariff equivalent rates and realigned tariffs on 48 commodities. But this was soon reversed based on the Magna Carta of the Small Farmers (RA7606) passed in 1991, which provided, among other things, blanket authority for restricting agricultural imports competing with domestic production.

It should be emphasized that the price and trade protection of most major import-competing agricultural products were largely untouched by the series of unilateral trade liberalization efforts since the late 1980s. Even with the WTO and other regional trade agreements, a number of non-tariff trade barriers continue to distort prices of some of the most important of commodities.

### *Agriculture-specific policies to the mid-1980s*

Although import tariffs are generally levied on all agricultural products and inputs, these are more commonly in effect only on agricultural inputs and agricultural products which are not locally produced in any significant quantity. Such products include milk, wheat and soybeans. Tariff protection is essentially redundant on exportable products that are competitive in world markets, and on non-traded commodities because of prohibitive transport and other marketing costs.

Over the period under study, a wide variety of policy instruments that influence price incentives were applied to major agricultural commodities. These include government monopoly control on international trade and domestic marketing operations, import bans, quantitative trade restrictions, import licensing, export taxes, and export bans.<sup>3</sup> Furthermore, despite serious efforts at unilateral trade liberalization, some of these policy instruments applicable to the more important import-competing agricultural products were largely kept intact. Indeed, some of these

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<sup>3</sup> Even for relatively minor crops, specific laws were passed prohibiting imports of onion, garlic, potatoes, and cabbages (RA 1296) in 1955, coffee (RA2712) in 1960, and tobacco/cigarettes except for blending purposes (RA4155 and other PDs) in 1964.

interventions had a long history, starting in the Commonwealth period that began in 1935. Under the Marcos' Martial Law era that began in late 1972, the government had considerably more leeway to intervene in prices and the marketing of agricultural products, and it did so. The following discussion, therefore, distinguishes the evolution of agricultural price intervention policies before and after 1986 when the Aquino government took over the reins of government.

### *Rice and maize*

When bad weather caused a drastic shortfall of staple food grains in 1936, the National Rice and Corn Administration (NARIC) was established to ensure stable and low prices for consumers, and adequate price incentives for farmers. To achieve these conflicting objectives, NARIC was granted monopoly control over imports and exports of rice and maize, as well as budgetary support and a credit line to undertake domestic market operations to defend price floors and retail ceilings and narrow geographical and seasonal dispersion of prices.

With the high world commodity prices in the early 1970s, government monopoly control over food commodities under this agency, which by then was renamed the National Food Authority (NFA), was expanded beyond rice and maize. This was to allow tariff-free importations of wheat, maize, soybeans, soybean meal, ruminant livestock and beef.

### *Sugar*

The sugar industry has historically been the most highly assisted industry. This is due to preferential access to the US market (that began in 1902) and the authority given to the Philippine government to administer its sugar export quota to the US in 1934 through the Jones-Costigan Act.

Initially, the domestic quota system was established for the orderly distribution of the US quota among sugar producers. In the 1960s, this quota system was also designed to reduce the burden on domestic consumers of the higher export prices resulting from the 1962 devaluation and the greater US quota allocation arising from the Cuban crisis. Under this system—which has continued to the present—producers are paid a composite price derived as an average of the export price, a lower domestic wholesale price, and a reserve price weighted by the quantity allocations targeted for US exports, the domestic market, and as a reserve.

As the Laurel-Langley Agreement ended in 1974, sugar trading was effectively nationalized, first under the Philippine Exchange Inc. (PHILEX, Inc.) and subsequently under the National Sugar Trading Association (NASUTRA). The latter was the sole wholesale buyer and seller of sugar in both the domestic and international market until the end of the Marcos regime in early 1986. It also established new refineries, operated sugar centrals, and acquired leading enterprises involved in the transport, storage, and handling of sugar for export.

### *Export commodities*

Except in the aftermath of the 1970 devaluation and the sharp increases in world commodity prices in the mid-1970s, there have been few attempts to intervene in the production and trade of exportable agricultural products. Initially as part of the stabilization measures, export taxes from 4 to 6 percent were imposed on major agricultural and other primary exports, and continued to be in place until the mid-1980s for revenue generation. The higher rate of 6 percent was imposed on traditional exports of coconut (copra) and centrifugal sugar to promote new and greater processing of agricultural exports. The lower rate of 4 percent was applied to coconut oil, dessicated coconut and coconut cake and meal, molasses, abaca, bananas, and pineapple products.<sup>4</sup>

In 1974 with the world commodity boom, additional export premium duties were briefly imposed, ranging from 20 to 30 percent of the difference between the ruling export price and a February 1974 base price. Consequently, windfall gains from the devaluation and the commodity boom in the early seventies were partially siphoned off from the producers of these agricultural and primary exportable commodities.

The Coconut Consumers' Stabilization Fund further levied the coconut industry in 1973 (commonly known as coco levy). This was partly to protect domestic consumers from a sharp rise in coconut oil prices on the world market, and partly to raise funds for the development of the coconut industry.<sup>5</sup> There was also the belief that taxing or restricting coconut exports could be beneficial as the Philippines was considered to have some monopoly power on the world

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<sup>4</sup> Export taxes were also imposed on logs at 10 percent, copper ore at 6 percent, and shrimps and prawns, lumber, plywood and veneer, and other metal ores at 4 percent.

<sup>5</sup> About 20 percent of the revenues from the tax briefly supported the direct subsidy on domestic consumption of coconut oil products. The remainder was supposed to finance development programs in the coconut industry such as replanting, vertical integration and scholarships. Later research showed that very little benefit, if any, accrued to farmers from these expenditures (Clarete and Roumasset 1990).

market. (While the Philippines accounted for a high share of total world coconut and coconut oil exports, any monopoly power was curtailed by the fact that coconut oil comprises only about 7 percent of the world lauric oil market). Part of the revenue from this levy was used to buy out 80 percent of the coconut oil milling industry and put it under the newly created, “privately owned” United Coconut Oil Mills, Inc. (UNICOM). This eventually acted as a monopsonist buyer of coconut from the farm sector. As world prices of coconut oil fell in 1982, the levy was lifted – only to be replaced by a policy of banning coconut exports to protect coconut oil mills.

### *Agriculture-specific policies after 1986*

By the late 1970s, world commodity prices began to fall. However, the policies and institutions established to cope with high world prices persisted, because they proved to be convenient means of raising revenues. Such measures ended up heavily taxing farmers to support private interests and bureaucratic inefficiencies (David 1983). It was not until 1986, under the new Aquino government, that several of these direct government price and market regulations were dismantled.

#### *Aquino reforms*

Export taxes, including the coconut export ban, were abolished, and the NFA’s monopolistic controls over international trade in wheat, soybeans, soybean meal and meats were removed, limiting NFA’s functions to rice and maize (as was the case prior to martial law). Its domestic marketing operations were also effectively reduced, because financial support had to come mostly from annual budgetary allocations rather than profits from importations.

The NASUTRA was replaced by the Sugar Regulatory Administration (SRA) which functioned primarily to regulate the market. It mainly allocated US sugar quotas, determined the allowable quantities of imports, the importers, the amounts to be sold in the domestic market, and the amount to be kept in reserve. It also performed developmental functions, such as research and extension, but it has ceased to engage in direct market operations.

Quantitative trade restrictions on fertilizers were removed, and tariffs on major agricultural inputs lowered substantially. However, UNICOMs monopsonist’s control over the

coconut market has continued, as the government's attempts to wrest ownership of this entity continue to be bogged down in court proceedings.

In spite of trade liberalization efforts in the late 1980s, most major importable agricultural commodities with any significant domestic production remain subject to quantitative import restrictions (QRs), particularly those protected by laws passed by Congress. Efforts to remove QRs were pre-empted by the passage of the Magna Carta of the Small Farmers (RA 7606) in 1991 which provided, among other things, blanket authority for restricting agricultural imports competing with domestic production. In addition, the Seed Law (RA 7308) was passed to regulate the import of seeds and planting materials.

#### *Uruguay Round Agreement on Agriculture*

The country's ratification of the GATT/WTO Uruguay Round Agreement in 1995 promised to set a decisive path towards trade liberalization in agriculture. It aimed to replace all QRs with tariffs, impose a ceiling on tariff rates, and reduce tariff protection over time. Unfortunately, the specific agreements and the manner of implementation did not live up to the promise (David 1994; David 2003).

First of all, rice — one of the most heavily regulated commodities — was exempted from tariffication until 2004, similar to the case of Japan and South Korea.<sup>6</sup>

Second, the quantitative trade restrictions (QRs) lifted in April 1996 under EO 313 were replaced by tariff rate quotas which initially raised the out-of-quota tariffs to the maximum (bound) tariffs committed under the WTO, while the in-quota tariffs were set mostly at the levels existing in 1995. The initial out-of-quota tariffs of 100 percent were typically higher than the nominal protection rates implied by the QRs in 1990-94. These were also higher than the book tariff rates under the earlier EO 470 which programmed the unilateral tariff reductions of a wide range of agricultural and industrial goods. Despite the scheduled reductions in the out-of-quota tariffs by 2004, these are equal to or even higher than tariff rates back in 1995 under EO 470. These rates are definitely higher than the government's target average tariff of 5 percent by the end of that period.

Furthermore, where QRs of the primary and lightly processed products were to be lifted, tariffs were raised on a number of imported agricultural products considered to be close

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<sup>6</sup> The Philippines is still negotiating in the WTO's Doha Round to keep government monopoly control over rice imports.

substitutes of commodities (e.g., feed wheat and barley, as substitutes for maize). Tariffs were also increased to the same level on the more heavily processed products using these commodities as the main raw materials (e.g., preserved and canned meat products, milled rice and maize, and roasted coffee).

Third, the manner in which the minimum access volume (MAV) provision or the tariff rate quota system of the Agreement was administered for major import-competing commodities in effect simply perpetuated quantitative trade restrictions. The quantities that may be imported at the lower in-quota tariffs were sometimes changed to prevent domestic prices from rising sharply whenever production shortfalls occurred. Thus, tariffs were operationally no different from QRs. For certain commodities, the right to import was given mostly to domestic producers of the same products (e.g., pork and poultry) who often choose not to utilize their import allocation so as to protect their domestic production. Moreover, since most of the MAV volumes are lower than import demand at the in-quota tariff rate, and the rights to import the MAV volume were not auctioned, large quota rents accrued to those given access to the MAV allocation, at least in the early period of its implementation.

Finally, the Agreement's lack of provision regarding market operations of parastatals allowed the Sugar Regulatory Administration to continue exercising its regulatory functions with respect to import levels and market destinations of domestic sugar production. In fact, the domestic market operations of the NFA to support producer prices were expanded in the late 1990s to include sugar.<sup>7</sup>

### *Regional trade agreements*

In 1992, the six original ASEAN member countries agreed to form the ASEAN Free Trade Area (AFTA). The aim of the area was to reduce tariffs to between 0 and 5 percent and to abolish quantitative trade restrictions and other non-tariff trade barriers by 2010. Under the Common Effective Preferential Tariff (CEPT) Scheme, unprocessed agricultural products were commonly included in the Sensitive List (SL), and thus they start trade liberalization later (between 2001-2003) and are required to achieve the 0 to 5 percent tariff targets by 2010. A recent study

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<sup>7</sup> The government also occasionally used the WTO sanctioned safeguard mechanism when additional tariffs were imposed on poultry.



indicated that thus far, the effective protection rates of agriculture are still largely unaffected by the CEPT (Pimentel 2006).

Unlike other FTAs, which usually delay or totally exclude trade liberalization of agriculture, the China-AFTA Agreement signed in 2002 specifically covered a significant portion of agricultural products in the Early Harvest Program (EHP). It called for the elimination of tariffs on live animals, meat and edible meat offals, fish, dairy products, other animal products, live trees, vegetables, fruits and nuts, and a few commodities from other chapters of the HS. The changes were to start January 2004 and be in place no later than January 2006 for ASEAN6, although some exceptions were allowed depending upon negotiations with China.

The Philippines signed its EHP with China in early 2006 and the agreement covered proportionately fewer commodities compared to other ASEAN countries, suggesting there is less interest in engaging with China in more open agricultural trade (Pasadilla 2006). Consumers, in general, will benefit from lower prices on covered commodities, while producers of exportable bananas, pineapples, mangoes and other tropical fruits, and coconut and coconut oil, are expected to gain from greater access to the vast Chinese market. Producers of vegetables, leguminous crops and pigmeat, together with producers of fruits for the local market, however, at least initially will be hurt by the entry from China of relatively cheap frozen meat and other meat products, potatoes, carrots, onions, garlic, peanuts, pears, apples, oranges and other fruits and vegetables.

### **Estimates of nominal and relative rates of assistance**

Measuring the distortions to incentives caused by price and trade policies has had a long history in the Philippines. The first effort was by John Power (1971) for 1965, which was followed by studies conducted by Norma Tan (1979) for 1974, Elizabeth Tan (1994) for the 1980s, Manasan and Pineda (1999) for the 1990s, and Aldaba (2005a,b) for recent years. These studies estimate the effective protection rates of all industries, both agricultural and non-agricultural. However, the main interest and analysis were concentrated on the manufacturing sector.

The first studies on agricultural protection were conducted by David (1983), Intal and Power (1991), and more recently David (2003). Unlike the industrial protection studies that quantified the effects of tariffs and indirect sales taxes, these agricultural protection studies were based on domestic and border price comparisons. This enabled the effects of non-tariff trade barriers to be measured and redundancy of tariffs, if any, to be taken into account. The indirect impacts of industrial protection and other economy-wide factors on agricultural incentives (through their effects on the exchange rate) were also analyzed.

### ***Methodology***

In this study, nominal rates of assistance to industries are estimated. The main focus of the present study's methodology (Anderson et al. 2008) is on government-imposed distortions that create a gap between domestic prices and what they would be under free markets. Since it is not possible to understand the characteristics of agricultural development with a sectoral view alone, the project's methodology not only estimates the effects of direct agricultural policy measures, but it also generates estimates of distortions in non-agricultural sectors for comparative evaluation.

More specifically, this study computes a Nominal Rate of Assistance (NRA) for producers of the main farm products, which are shown in Figure 1. It also generates an NRA for nonagricultural tradables, for comparison with that for agricultural tradables via the calculation of a Relative Rate of Assistance (RRA – see Anderson et al. 2008). This provides a consistent time series annual measure of distortions over more than four decades using the value of production as weights to compute sectoral and sub-sectoral averages. This contrasts with previous studies which, except for Manasan and Pineda (1999), have computed sectoral averages using trade volume as weights.

A small open economy is assumed so that the country's trade level does not affect world prices.<sup>8</sup> Border prices are estimated based on world price series reported by the World Bank. For importables these are adjusted to c.i.f. values by assuming the cost of transport and insurance to

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<sup>8</sup> Only in coconut products is the country a significant trader, being the world's largest producer and exporter for most of the period under study. However, coconut products are to a large extent substitutable with competing products such as palm oil and soybean oil. Coconut oil – the most important coconut product – constitutes only a small (7 percent) share of world trade in vegetable oils.

be a constant 20 percent of f.o.b. world prices. The country's officially recorded import or export unit values were not chosen because foreign exchange controls, export taxes and other taxes mean export unit values are significantly undervalued, particularly in the period up to the mid-1980s. For rice, maize, and sugar, either the import unit values may be overvalued (in the case of imports by NFA) or undervalued (as private importers seek to lower their tariff payments by under-invoicing). There were also many years when no imports were made for some importable products.

Rice, maize, sugar, pigmeat, beef, and poultry are consistently classified as importables even though there were no imports in some years. In the case of sugar, imports started only in the 1990s, but even in the 1960s and 1970s exports of sugar were confined to the high-priced United States market to which the Philippines had preferential access, and were not competitive at the free market world price. Sugar is thus also treated as an importable.

In the absence of detailed time series data on marketing costs, the domestic price is defined as the wholesale price which is the closest to the same point in the marketing chain as the border price.

For most of the agricultural commodities where domestic and border prices are compared, the commodity that is internationally traded is lightly processed rather than the primary product sold at the farm level: milled rice vs paddy, raw or refined sugar vs sugarcane, frozen pigmeat, beef, or poultry vs hog, cattle or chicken birds. In the case of sugar, the rates of protection received by farmers and millers are the same because the revenues derived from the sale of raw and refined sugar in both the domestic and United States markets is shared proportionately between the two in the ratio 70-30.<sup>9</sup> The ratio of the farm price of paddy to the retail price of rice did not significantly change, suggesting that farmers and rice millers together with traders share proportionately from the protection accorded the rice industry. For rice, maize, pigmeat, beef, and poultry, it is assumed that NRAs of the processed and farm products are

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<sup>9</sup>According to Borrell et al. (1994), the quedan system, which allocates products produced to the various markets in fixed proportions, lowers incentives to increase production and invest in yield-increasing technology. This is because higher production reduces gross revenues. Also, because export allocation to the US is in a fixed ratio, there is no incentive to improve milling quality for export that will increase net returns. On the other hand, the sugar sharing arrangement (60 to 70 percent to growers and 30 to 40 percent to millers depending on the recovery rate) — instituted by law (RA 809) to provide millers a share of the benefits from the price protection — also reduces both growers' and millers' incentives to raise productivity. That is, growers receive only 60 to 70 percent of benefits from productivity-enhancing investments, while millers receive only 30 percent to 40 percent.

equivalent. In fact, import tariffs on these farm products are generally the same as their lightly processed variety.

Aside from the major agricultural commodities specified above, NRAs are assumed for the other, non-covered crops within the sector. Since price comparisons are more difficult to perform for non-covered exportables— including pineapples, mangoes, abaca, and tobacco — their average NRA is assumed to be zero or equal to the export tax whenever it applied. For products that are non-traded because of prohibitive marketing costs, such as roots and tuber crops, zero NRA values are assigned.<sup>10</sup> For the many import-competing vegetables, other fruits, and other minor crops, their NRA as a group is assumed to be the same as the average for covered importable products.<sup>11</sup> We assume that the weights are one-third each for exportables, importables, and nontadables in the non-covered part of farm production (which in aggregate amounts to around one-fifth of the agricultural sector's value of production at undistorted prices).

For non-agricultural importable products, NRAs are generally based on book tariff rates,<sup>12</sup> apart from lightly processed food manufacturing industries — rice and maize milling, sugar milling and refinery, coconut oil production and refining, etc. — where the NRAs are based on price comparisons. For a number of non-agricultural primary industries in fishery, forestry, and mining, we use the export taxes that applied from 1970 to 1985. Definitions of a product's tradability and industry weights used were the same as for agriculture.

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<sup>10</sup>As prescribed in Anderson et al (2008), a commodity is considered non-tradable when the proportion of imports and exports to total value of production is less than 5 percent. When a commodity/or commodity group is both exported and imported in significant amounts (that is, more than 2.5 percent of total value of output) the NRA is estimated as the average of the NRA of that commodity as an exportable and as an importable weighted by their respective proportions of export and import values to the total traded value.

<sup>11</sup> Despite the supposed removal of quantitative trade restrictions for all agricultural commodities except rice, non-tariff barriers appear to be significant in many commodities, such as in vegetables, fruits, and meat. Price comparisons are difficult to perform on many of these products because of the lack of consistent world price series, difficulties in making adjustments for quality differences, and the complexity of measuring the impact of increased imports of a commodity that may not be grown in the country on the price of a highly substitutable product that is produced domestically. One clear indication, however, is the very substantial smuggling of vegetables and fruits and nuts from China. Reported exports of these commodities to the Philippines in the Chinese trade statistics have been up to ten times higher than recorded imports of these commodity groups in the Philippine official trade statistics, despite the already low tariffs on these smuggled products (mostly 3 percent, but with some up to 10 percent since the late 1990s).

<sup>12</sup> From 1960 up to the early 1980s, differences in the indirect tax on domestically produced and imported products imposed during this period were added to tariffs in the computation of NRAs. While the tax rates were in most cases the same, it is effectively greater because the tax base for imports is the tariff-inclusive price augmented by a percentage mark-up. In 1974, the weighted average nominal tariff rate alone equaled 22 percent for manufacturing, but the nominal rate of protection increased significantly to 31 percent when the effect of the difference in tax base is included (Tan 1979).

### *NRAs for agriculture*

Estimates of the nominal rates of assistance of agricultural commodities from 1962 to 2004 are summarized in Table 5. Although the estimated NRAs are highly variable over time (see the annual estimates in Appendix Table A5), several general patterns emerge from the 5-year averages.

First, import-competing industries have enjoyed much more assistance than exportables. Coconut production has been penalized by negative NRAs over the entire period of the study, averaging around -20 to -25 percent from the 1970s up to the mid-1980s. Apart from the multiple exchange rate policy prior to 1970 (not measured here), this was due to the imposition of several measures: the export tax, the coconut levy, and the coconut export ban to siphon off windfall gains from the 1970 devaluation; the subsequent world commodity boom of 1973-74 that was incompletely transmitted to the domestic market; and lower raw material costs for the coconut oil milling industry. Despite the abolition of these policy instruments in 1986, however, coconut farmers continued to be implicitly taxed, albeit at a lower rate of around 15 percent of border prices. Evidently, the government's failure to dismantle the former UNICOM's ownership of 70 to 80 percent of the coconut oil milling industry up to the present time has allowed the continuation of its monopsonist's power over coconut's domestic prices.

Second, among import competing commodities, the level of NRAs differed significantly and the differences widened between two groups of import-competing products over time: the NRAs for the most important commodities — rice, maize, and sugar — increased, while those for the minor but numerous and high-valued commodities declined. Each of these commodities is considered in more detail below.

Third, the increasing level of NRA observed since the 1980s may be due in part to the government's efforts to reduce the burden of adjustment of the agricultural sector to a secular long-term decline of world commodity prices. This declining trend is visible in real domestic prices compared to real world prices for several commodities in Appendix Figures A1 to A8.

Fourth, the dispersion of NRAs among agricultural products within the farm sector (as measured by the standard deviation of those NRAs, reported near the bottom of Table 5) has not diminished over time. Nor has the trade bias index (Table 6), indicating that the NRA for importable farm products has persistently remained above that for exportables. Both of these

indicators imply that the efficiency of resource use within the farm sector has been substantially compromised by agricultural policies.

And fifth, NRAs fluctuate from year to year (see Figure 2 and Appendix Table A5) mostly in response to world price changes and sometimes in response to exchange rate adjustments. For example, the NRA for import-competing agricultural products is below trend in the 1973-74 and 1980 years of high international prices, and above trend in the low-priced mid-1980s period. This suggests that domestic price stabilization has been an important objective of agricultural price and trade policy. Table 7 indicates that the estimated coefficients of variation of domestic prices tended to be considerably lower than those of world prices, particularly for major import-competing commodities.

### *Rice*

The trends in the nominal rate of assistance to rice reflected the NFA's inability to simultaneously attain its inherently conflicting objectives of providing low prices to consumers and remunerative incentives to farmers. Prior to the late 1980s, the domestic price of rice was, on average, about equal to the long term level of the border price. The negative levels of protection from the 1970s to the early 1980s were due to unusually high world prices during this period. This did not discourage farmers though, as the Green Revolution and rice farming land reform were transforming tenants to owner-operators.<sup>13</sup>

With the drop in the world price of rice, a sharp fall in irrigation investments, and stagnation of the yield potential of newer modern varieties, growth in demand for rice increased faster than production from the late 1980s. The NRA for rice became positive and rose to about 50 percent by the early 2000s. This is despite much higher imports than ever before, reflecting the country's rising comparative disadvantage in rice production.

### *Maize*

Maize is a food staple for about 10 to 15 percent of the population and a major feed ingredient for livestock. In contrast to rice, however, domestic production has been consistently protected, with the NRA steadily rising over time from about 25 percent in the late 1970s and early 1980s

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<sup>13</sup> In fact, the new seed-fertilizer technology and the accompanying irrigation expansion increased the country's comparative advantage in rice production, briefly turning the country from being a net importer to being self-sufficient and reducing the domestic price in real terms by the late 1970s.

up to nearly 80 percent by the late 1990s. Unlike rice, there is less political pressure to lower maize prices for poor consumers, because maize is mostly eaten as a subsistence crop among upland farmers in the southern part of the country.

### *Sugar*

When sugar is categorized as an importable and the world price of sugar — and not the export unit value to the US premium market — is used as the border price in the calculation of the NRA, the domestic sugar industry is clearly the most highly protected industry throughout the period under study. US consumers paid a large part of the income transfer to the sector in the 1960s and early 1970s when nearly all domestic production was exported. However, the burden shifted to Filipino consumers and food processors at the end of the Laurel-Langley Agreement in 1974. At that time, the US sugar quota dropped sharply. Exports which continue to be confined to the protected United States market now account for only one-tenth of domestic production. Yet, because of import restrictions, the average nominal rate of assistance to the sugar industry has increased over time, and has averaged around 90 percent during the past decade.<sup>14</sup>

### *Poultry and other livestock*

Poultry producers received a high level of protection. A slightly increasing trend in the NRA is discernable over time: from about 40 percent prior to 1985, when the high tariff protection (70 percent) was redundant to a significant extent, to about 50 percent in later years.

The pigmeat industry had significant tariff protection, although generally it has been lower than poultry. After 1995, the government adopted the same level of high in- and out-of-quota tariffs for both poultry and pigmeat under the WTO Agreement. However, the low tariff was largely redundant up to the 1980s, as were the relatively high tariffs after 1995.

Tariff protection for beef was historically less than that for pigmeat: the NRA averaged around 10 percent until the late 1980s. Beef was not included among the sensitive products whose tariffs were raised in the aftermath of the WTO Agreement. Nonetheless, an upward trend in its estimated NRA can also be observed during the 1990s. It appears that the government's attempt to promote cattle fattening activities, by allowing duty-free imports of young cattle

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<sup>14</sup> Even the large margins conferred on importers of sugar as a result of this high level of nominal protection have been mostly received by the sugar cane growers, who receive most of the rights to import dispensed by the Sugar Regulatory Authority.

imported from Australia, was accompanied by more restrictive non-tariff trade barriers on beef to increase incentives. The expansion of the cattle fattening business was short-lived, however, as tariffs on beef were reduced in the late 1990s and import restrictions became untenable.<sup>15</sup> The lower protection for beef compared to the poultry industry may be explained by the prevalence of large-scale integrators producing poultry through contract farming, in contrast to the beef industry which is dominated by backyard producers. However, pigmeat is also dominated by backyard producers, and it had relatively high protection rates.

### *Agricultural inputs*

To infer the effect of price intervention policies on value added, trends of the NRA on major intermediate inputs commonly used in agricultural production are reported in Appendix Table A1. Until the mid-1980s, the government's industrial promotion policies significantly raised domestic prices of manufactured inputs to agriculture. The consumer tax equivalent of import protection on agricultural inputs such as fertilizers, agricultural chemicals, farm machinery and even water pumps was generally higher than the NRAs for agricultural outputs, except for sugar in some years. With the exception of subsidies for gravity irrigation in rice, there was no significant offsetting input assistance to agriculture. Indeed, despite price controls, tax free importations, and direct subsidies to fertilizer companies in this early period, the consumer tax equivalent on farm inputs was negative only during 1970-1974 (due to the four-fold jump in world prices of oil). These are not incorporated in the aggregate NRA for crop agriculture but, if they had been in the manner described in Anderson et al. (2008), they would have lowered the estimated NRA for crops by a small number of percentage points, and more so in the earlier decades than in recent times. The estimated NRAs for livestock also would be lower if the impact on feedmix prices of import restrictions on maize were taken into account.

### *NRA for non-agriculture and RRA for agriculture*

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<sup>15</sup> During this period, imports of live cattle averaged more than 200,000 heads. This number has declined significantly as the cattle fattening business is now limited to the Del Monte and Monterey (San Miguel) companies which use by-products of their other business, i. e., pineapple canning and beer manufacturing, respectively, as their main feed ingredient. Earlier, live cattle were mostly imported for almost immediate slaughtering, and thus the government's policy was promoting the slaughtering business, more than cattle production.



Agricultural incentives are also affected indirectly by rates of assistance to non-agriculture. Mobile resources move according to the relative incentives across sectors or industries. Figure 3 and Table 7 show the trends in the average nominal rates of assistance of the agricultural and non-agricultural sectors, as well as the relative rate of assistance to agriculture. The contrast in the trends between the two sectors is quite striking. Whereas the average NRA for agriculture was lower than non-agriculture prior to the mid-1980s, it rose to an average of more than 30 percent in the most recent decade or so. On the other hand, with the series of unilateral trade liberalization measures, the NRA for non-agriculture steadily declined from nearly 20 percent in the 1960s and 1970s to only 7 percent by the early 2000s.

As a consequence, assistance to agriculture is now much higher than to non-agriculture, so the relative rate of assistance has gone from an average of around -15 percent prior to the mid-1980s to an average of more than +20 percent in recent years. This trend indicates that the efficiency of resource use as between farming and production of non-agricultural tradables first increased as the RRA became less negative but then decreased as the RRA became increasingly more positive. That is, there were too few resources in the country's agricultural sector up to the mid-1980s, but since then there have been too many on average (and especially in import-competing agriculture).

### **Explaining patterns of distortion to agricultural incentives**

In general, countries switched from taxing to subsidizing their agricultural sector in the course of economic development, primarily due to political economy factors (Anderson, Hayami and others 1986; Lindert 1991; Anderson 1995). In a country which would be self-sufficient in food in a world of free agricultural trade, that shift is expected to occur when its per capita income reaches 2.6 times the global average (Tyers and Anderson 1992). For a country that would be only 65 percent self-sufficient in food under free trade, the shift would occur when its per capita income reached the global average (\$4300 in 1992). In the Philippine case, the shift from taxing to assisting agriculture directly through price interventions occurred at a lower level of economic

development than predicted by earlier studies, as per capita income in the Philippines was only about \$1200 even by the late 1990s.

Why did the switch towards higher agricultural protection occur early in the Philippines? The explanation lies in a set of unique historical events, political economy factors, the political system, and a strong nationalist sentiment for food self-sufficiency, especially in the case of rice. As discussed earlier, the highly skewed land ownership distribution and dualistic agrarian structure arising from the country's colonial land policies and agro-ecological conditions meant there were large landowners and plantation operators who were able to effectively lobby for their vested interests. These farmers were historically the major political leaders at the helm of Congress and the national and local executive branches of the government. The landed oligarchs were also the business elite, who successfully pushed for an industrial protection policy that biased incentives against the agricultural sector (Hara 1994). But as the international pressure for trade liberalization mounted during the past two decades, it was easier to resist the opening of domestic markets for food staples by playing up the national sentiment for food self-sufficiency. Political pressure to raise agricultural protection was strengthened by the expanded lobby groups consisting of farmer organizations, large land owners, and agri-business firms such as livestock and poultry, millers, seed companies, and the input suppliers.

There has been little resistance to high prices of white maize as food because it is primarily a subsistence crop. The livestock (including poultry) producers and feed millers who use mostly yellow maize have chosen to lobby more for higher livestock output protection to offset the high maize prices than for a more rational maize-livestock policy. Objections to the highly restrictive maize import policy have been addressed by providing import allocations at lower tariffs to the large, more organized, and vocal sector of the feed, poultry, and pigmeat industries. In addition, large feed mills and livestock producers also own flour mills, and are thus able to substitute low-grade wheat subject to only a 10 percent tariff for the artificially high-priced maize. That policy structure provides the large-scale feed and livestock producers a cost advantage over the small ones who have to rely on the domestic market for their maize supplies.

Aside from the large size of farms and mills, the sugar sector has historically had strong political power because of its close relationship and common interest with the government in lobbying for protecting the country's preferential market access share of the US sugar market. In contrast, the share of sugar in direct household expenditure is very small and therefore

consumers have generally tolerated or been unaware of high sugar prices. Resistance from the food processing sector against high sugar prices was mitigated by granting larger, more vocal food processors some tariff-free sugar import privileges.

### **Concluding remarks**

Price intervention policies became more favorable from the mid-1980s in the Philippines agricultural sector. Protection of major import-competing commodities was increased and a series of unilateral trade liberalizations lowered implicit tariffs on inputs and the protection of the non-agricultural sector. Thus, improvements in agricultural incentives occurred at the cost of inefficiencies in resource allocation arising from widening distortions in prices within agriculture, and between agriculture and non-agriculture.

Artificially raising the profitability of major import-competing commodities directly increased the cost of land for other crop production. As well, it indirectly reduced the competitive advantage of exportable agricultural products in world markets. The high maize price policy also lowered the international competitiveness of the pigmeat industry, in which the Philippines may well have a comparative advantage. The very high protection for sugar hurts not only consumers but also the food processing industry, which accounts for over 20 percent of value added and employment in manufacturing. Excessively high protection for major staple food commodities reduces the welfare of rural landless and urban poor households and puts pressure on wages, making labor-intensive manufacturing industries less competitive relative to the low wage, cheap food economies such as Vietnam and China.

The economic waste caused by price intervention policies is magnified by the continued use of quantitative trade restrictions instead of tariffs. In particular, the government's monopoly on rice imports and domestic marketing operations through the NFA not only have been extremely costly but also have failed to achieve the basic conflicting objectives of lowering food prices to consumers, raising producer prices, and stabilizing both sets of prices. Use of quantitative restrictions promote rent-seeking, reduces government revenue, incurs significant bureaucratic costs, and worsens price uncertainties.

Unfortunately, recent policy changes in response to the WTO agreement seem to have exacerbated, rather than mitigated, such problems: nominal protection rates for major import-competing commodities were not only raised, but the scope of NFA operations was inadvertently expanded. Rice market interventions and the use of quantitative restrictions have persisted because the economic costs, and even some of the financial costs, are not readily apparent to the general public. Meanwhile, the bureaucracy is corrupted through commissions, bribes, and other rents typically involved in government procurement and import licensing, making it even more difficult to effect trade liberalization.

There are no indications that the Philippine government will move towards greater trade liberalization in agriculture in the near future. In the current negotiations under the Doha Round, efforts are being made to retain the relatively high level of tariff protection on the major import-competing agricultural commodities. Furthermore, the government is not taking any step to dismantle the institutions and other policy instruments that regulate the imports of rice, sugar, and other commodities. With the sharp rise in world grain prices in recent years, the government will all the more be politically compelled to continue with the food self-sufficiency strategy, rather than reliance on open international markets, to achieve food security.

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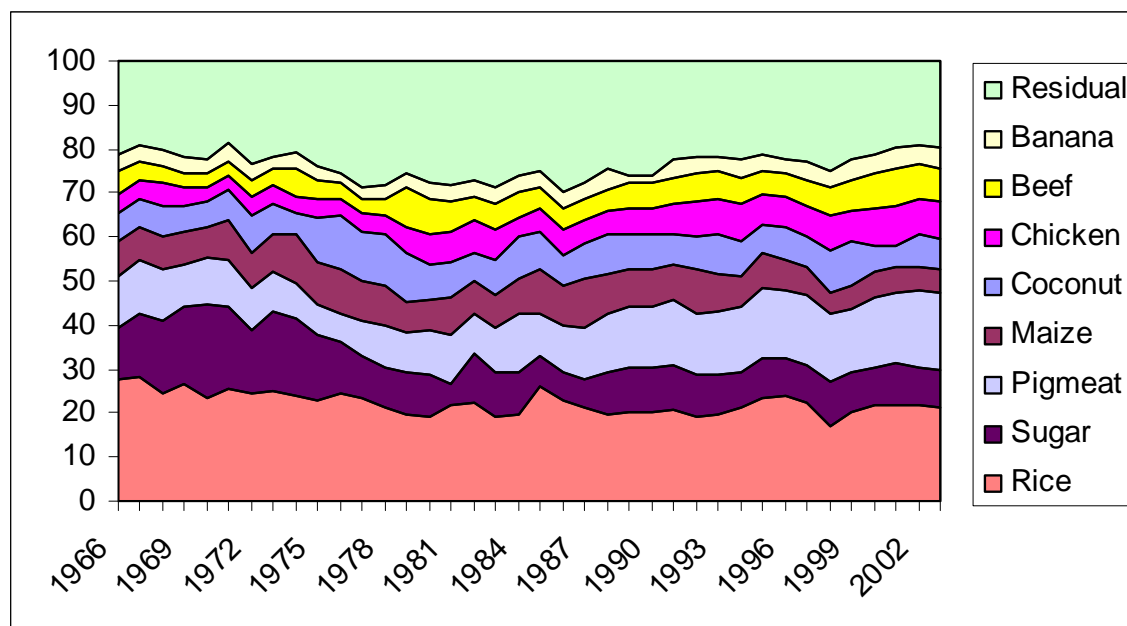
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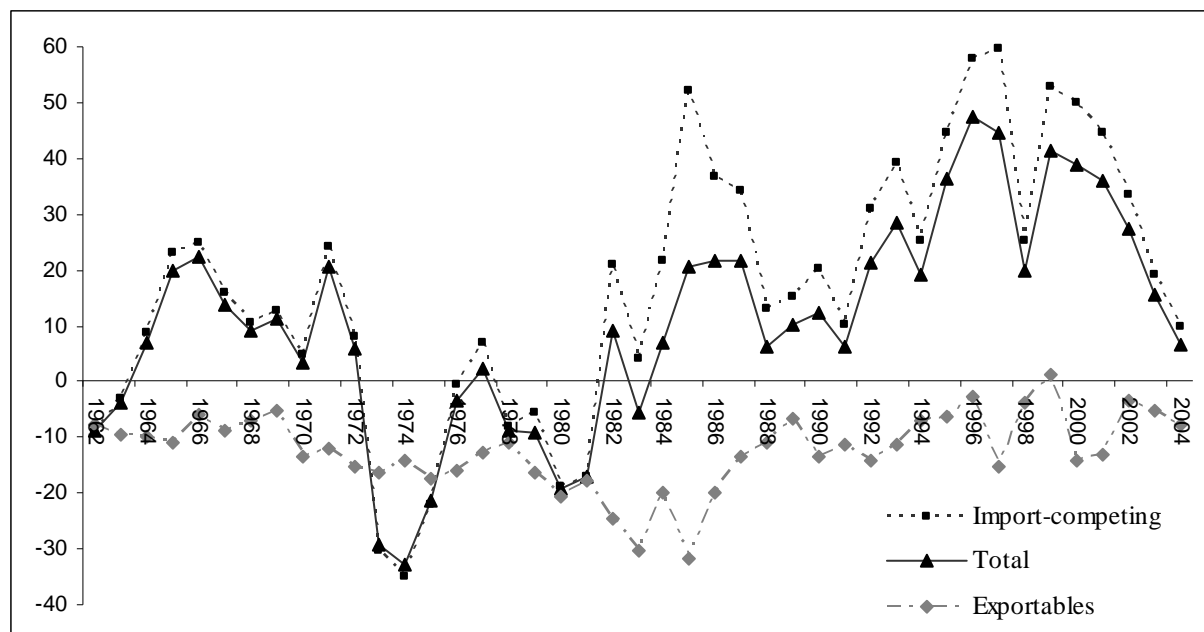
Figure 1: Value shares of primary production of covered and non-covered products, Philippines, 1966 to 2004

(percent, at distorted prices)



Source: Authors' calculations, based on producer price and production data from FAOSTAT

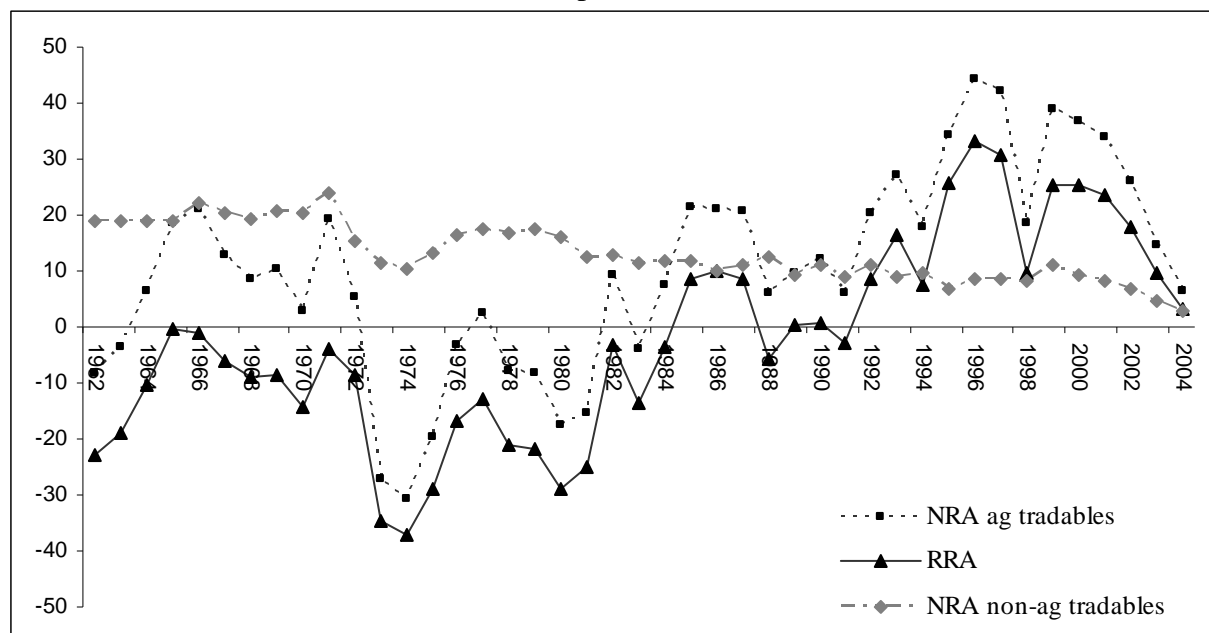
Figure 2: Nominal rates of assistance to exportable, import-competing and all covered agricultural products, Philippines, 1962 to 2004  
(percent)



Source: Authors' spreadsheet



Figure 3: Nominal rates of assistance to all agricultural and nonagricultural tradable industries and relative rate of assistance, Philippines, 1962 to 2004  
(percent)



Source: Authors' spreadsheet

Table 1: Average growth rates of gross domestic product, gross value added in agriculture, and agriculture exports, the Philippines and other selected Asian countries, 1960 to 2004 (percent)

	1960 - 1980			1980 - 2004		
	GDP	Ag GVA	Ag Exports	GDP	Ag GVA	Ag Exports
Philippines	5.3	4.1	12.0	2.7	2.0	1.6
Indonesia	7.9*	4.6*	11.6	5.4	2.9	7.2
Malaysia	7.2	4.8*	12.7	6.6	2.2	5.7
Thailand	7.5	4.8	13.5	6.0	2.7	6.7
India	3.6	2.2	9.0	5.4	3.4	5.8
Pakistan	5.8	3.6	14.2	4.7	3.7	7.2
Bangladesh	2.6	1.6	3.1	4.3	2.7	1.3
China	5.5	4.3	15.0	9.5	4.2	6.6
Vietnam	-	-	-	6.6	3.7**	18.2

<sup>a</sup> Growth rates estimated by regression.

\* Refers to 1970-1980.

\*\* Refers to 1985-2004.

Sources of basic data : World Development Indicator (WDI) World Bank; FAOSTAT

Table 2: Changing structure and trade openness of the Philippine economy, 1960 to 2004  
(percent)

	1960	1970	1980	1990	2000	2004
Agriculture's share in:						
GDP	30	28	24	22	20	14
Employment	61	52	48	45	37	37
Imports	19	14	8	10	9	8 <sup>a</sup>
Exports	64	44	35	15	5	6
Trade openness indicators:						
Ag imports/GVA	6 [9]	10 [16]	9 [23]	13 [27]	22 [45]	26 <sup>a</sup> [51]
Ag exports/GVA	33 [9]	44 [15]	26 [17]	14 [19]	15 [51]	19 [46]
Ag imports & exports/GVA	38 [18]	54 [36]	35 [43]	28 [48]	37 [96]	45 [97]

<sup>a</sup> When agricultural inputs are included, the ratio of agricultural imports to gross value added in agriculture is significantly higher, reaching 39 percent in 2004. The ratio of agricultural inputs to total imports based on that broader definition is 11 percent in 2004.

Note: Figures in square brackets refer to trade openness for the whole economy.

Sources of basic data: National Statistical Coordination Board; Bureau of Labor and Employment Statistics; National Statistics Office

Table 3: Growth rates of gross value added of major agricultural commodities, Philippines, 1960 to 2004

(at constant 1985 prices, percent)

	1960-70	1970-80	1980-90	1990 - 2004
<b>Crops</b>	<b>4.3</b>	<b>6.2</b>	<b>1.1</b>	<b>1.9</b>
Rice	-	4.3	2.9	3.6
Maize	-	5.2	3.1	1.9
Coconut <sup>a</sup>	-	7.8	-3.9	1.1
Sugar	-	5.2	-1.8	4.1
Banana	-	13.9	-1.8	4.0
Other crops	-	8.1	2.2	0.8
<b>Livestock and poultry</b>	<b>3.1</b>	<b>3.1</b>	<b>5.7</b>	<b>4.4</b>
Livestock	-	0.8	4.8	3.5
Poultry	-	8.5	7.5	5.7

<sup>a</sup> Throughout the word coconut is used to also cover the main farm product known as copra.

Source: Authors' compilation using basic data from the National Statistical Coordination Board

Table 4: Revealed comparative advantage<sup>a</sup> of major agricultural commodities, Philippines, 1960 to 2004

	1960	1970	1980	1990	2000	2004
<b>All agriculture<sup>b</sup></b>	<b>3.0</b>	<b>2.6</b>	<b>2.9</b>	<b>1.6</b>	<b>0.6</b>	<b>0.8</b>
Coconut	116	145	224	212	71	97
Sugar <sup>c</sup>	18	21	12	4	1	1
Banana	-	-	3	23	11	14
Pineapple						
Canned	-	-	82	70	27	29
Fresh	-	-	49	55	10	8

<sup>a</sup> Estimated as the ratio of the share of a commodity group in a country's exports to that commodity group's share in world exports. Except for 1960 and 2004, all are 3-year averages centered at year shown.

<sup>b</sup> Includes fisheries.

<sup>c</sup> Note that sugar has been historically exported to the US typically at a preferential price (i.e., higher than world prices). Hence a value greater than unity in this case does not reveal comparative advantage. However, the sharp declining trend may still be interpreted as a rapid deterioration in comparative advantage.

Source of basic data: FAOSTAT

Table 5: Nominal rates of assistance to covered products, Philippines, 1962 to 2004

(percent)

	1962-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
<b>Exportables<sup>a</sup></b>	<b>-9.0</b>	<b>-7.6</b>	<b>-14.3</b>	<b>-14.6</b>	<b>-22.6</b>	<b>-16.5</b>	<b>-11.4</b>	<b>-5.4</b>	<b>-8.7</b>
Coconut	-24.4	-20.2	-25.3	-16.7	-27.1	-20.6	-15.3	-7.8	-14.1
Banana	0.0	0.0	-4.0	-4.0	-4.0	-0.8	0.0	0.0	0.0
<b>Import-competing products<sup>a</sup></b>	<b>-1.1</b>	<b>17.4</b>	<b>-5.6</b>	<b>-5.8</b>	<b>2.2</b>	<b>30.2</b>	<b>25.1</b>	<b>48.1</b>	<b>31.4</b>
Rice	-3.4	-1.4	-9.7	-17.9	-16.3	14.5	20.9	52.7	50.7
Maize	0.5	38.4	14.0	24.3	20.1	59.8	62.6	78.5	54.5
Sugar	-8.2	120.7	-11.7	-1.7	59.5	123.2	49.3	97.2	79.3
Beef	15.0	15.0	12.0	10.0	5.0	17.0	28.0	28.0	10.0
Pigs	-30.0	13.6	3.2	-5.5	35.8	51.0	25.1	20.6	-8.3
Chicken	8.9	67.1	28.9	28.1	38.4	42.9	56.5	42.2	52.1
<b>Total of covered products<sup>a</sup></b>	<b>-1.9</b>	<b>15.3</b>	<b>-6.5</b>	<b>-8.1</b>	<b>-5.1</b>	<b>16.1</b>	<b>17.5</b>	<b>37.9</b>	<b>24.9</b>
Dispersion of covered products <sup>b</sup>	17.1	29.6	25.2	22.3	28.6	29.9	27.5	27.9	30.4
% coverage (at undistorted prices)	78	79	79	74	73	73	77	77	80

<sup>a</sup> Weighted averages, with weights based on the unassisted value of production.

<sup>b</sup> Dispersion is a simple 5-year average of the annual standard deviation around the weighted mean of NRAs of covered products.

Source: Authors' spreadsheet

Table 6: Nominal rates of assistance to agricultural relative to non-agricultural industries, Philippines, 1962 to 2004

(percent)

	1962-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Covered products <sup>a</sup>	-1.9	15.3	-6.5	-8.1	-5.1	16.1	17.5	37.9	24.9
Non-covered products	-0.4	5.8	-2.3	-2.4	0.3	10.0	8.4	16.0	12.3
All agricultural products <sup>a</sup>	-1.6	13.3	-5.6	-6.6	-3.6	14.4	15.4	33.0	26.0
Non-product specific (NPS) assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Total agricultural NRA (incl. NPS) <sup>b</sup></b>	-1.6	13.3	-5.6	-6.6	-3.6	14.4	15.4	33.0	26.0
Trade bias index <sup>c</sup>	-0.03	-0.18	0.04	-0.03	-0.15	-0.31	-0.26	-0.34	-0.31
<i>Assistance to just tradables:</i>									
All agricultural tradables	-1.7	14.3	-6.0	-7.2	-4.0	15.8	16.7	35.7	27.9
All non-agricultural tradables	19.0	20.3	16.3	16.3	12.9	11.0	9.9	8.6	7.3
<b>Relative rate of assistance, RRA <sup>d</sup></b>	-17.4	-5.0	-19.8	-20.3	-14.9	4.3	6.1	24.9	19.1

<sup>a</sup> NRAs including product-specific input subsidies.

<sup>b</sup> NRAs including product-specific input subsidies and non-product-specific (NPS) assistance. Total of assistance to primary factors and intermediate inputs divided to total value of primary agriculture production at undistorted prices (%).

<sup>c</sup> Trade bias index is  $TBI = (1 + NRA_{agx}/100)/(1 + NRA_{agm}/100) - 1$ , where  $NRA_{agm}$  and  $NRA_{agx}$  are the average percentage NRAs for the import-competing and exportable parts of the agricultural sector.

<sup>d</sup> The RRA is defined as  $100 * [(100 + NRA_{agt}) / (100 + NRA_{nonagt}) - 1]$ , where  $NRA_{agt}$  and  $NRA_{nonagt}$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Source: Authors' spreadsheet

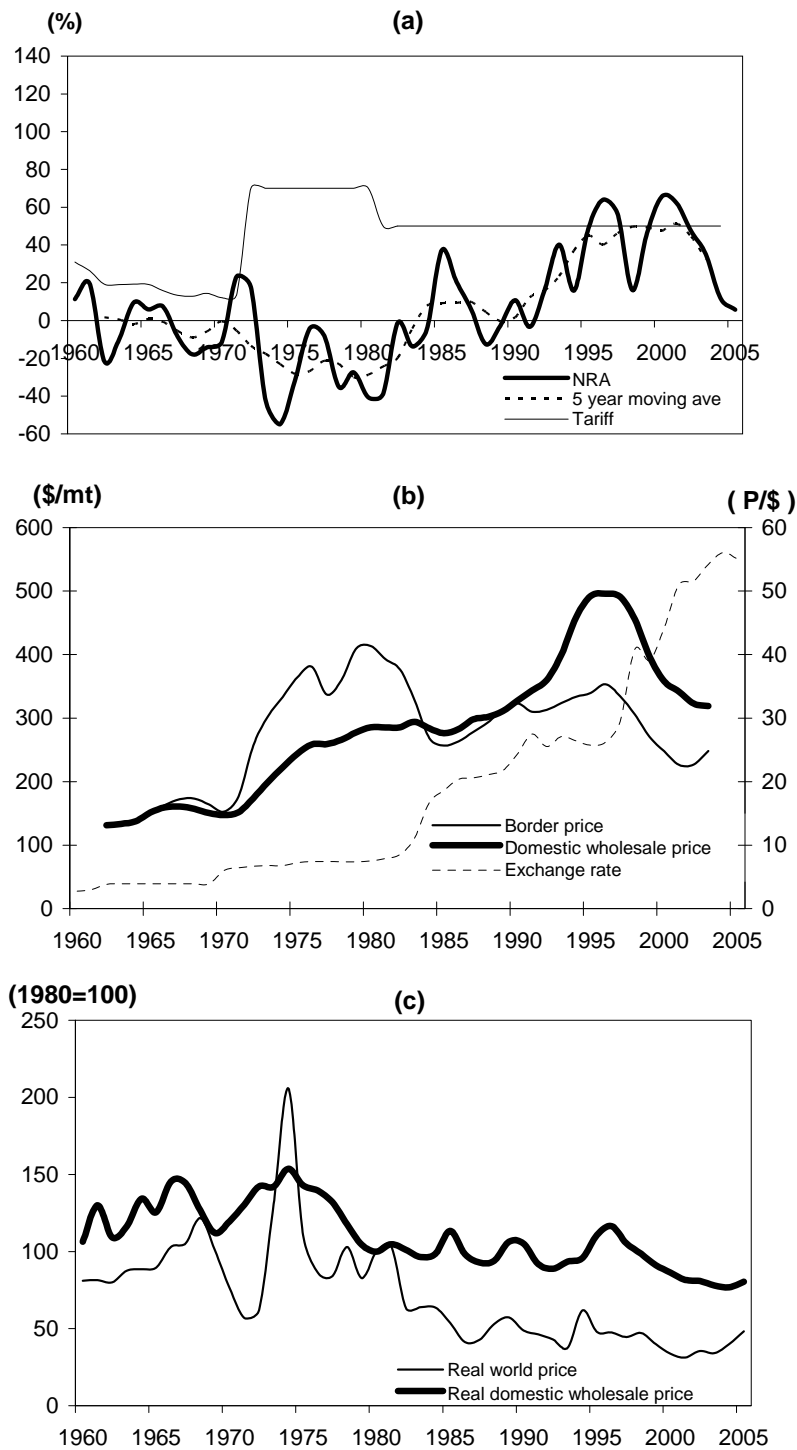
Table 7: Coefficient of variation of real international and Philippine wholesale prices of major agricultural commodities, 1960 to 2004

		1960 - 2004	1960 - 1980	1980 - 2004
Rice	World	47	32	34
	Domestic	19	12	11
Maize	World	38	17	27
	Domestic	23	17	14
Coconut	World	49	27	40
	Domestic	45	31	36
Coconut oil	World	50	27	43
	Domestic	43	32	33
Sugar	World	80	71	60
	Domestic	19	14	18
Beef	World	33	21	23
	Domestic	28	35	17
Pigmeat	EUV Sing	46	44	23
	Domestic	13	12	14
Poultry	EUV Sing	37	33	14
	Domestic	29	17	15

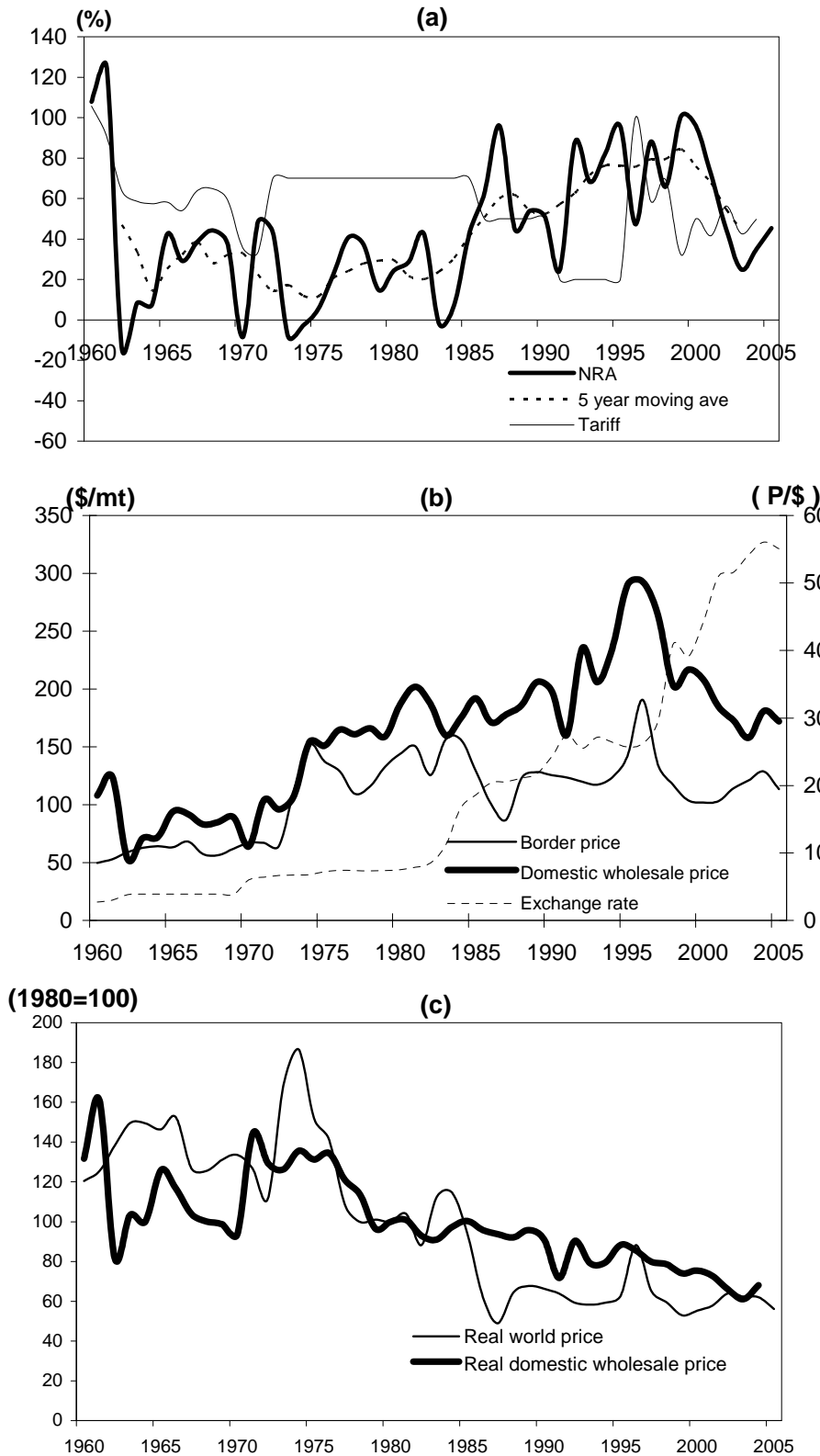
Source: Estimates based on data in authors' spreadsheet



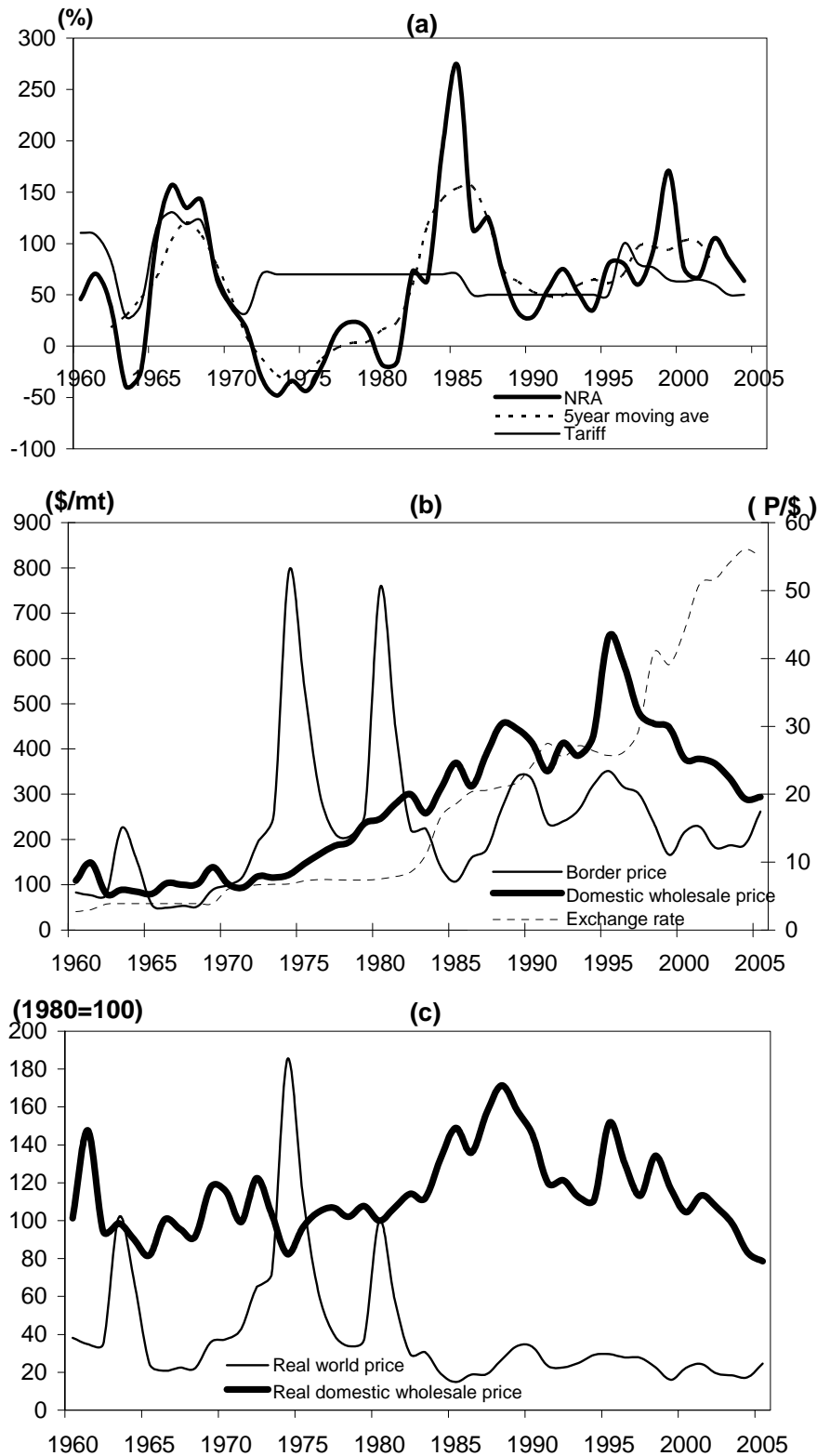
Appendix Figure A1: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Rice**, 1960-2004



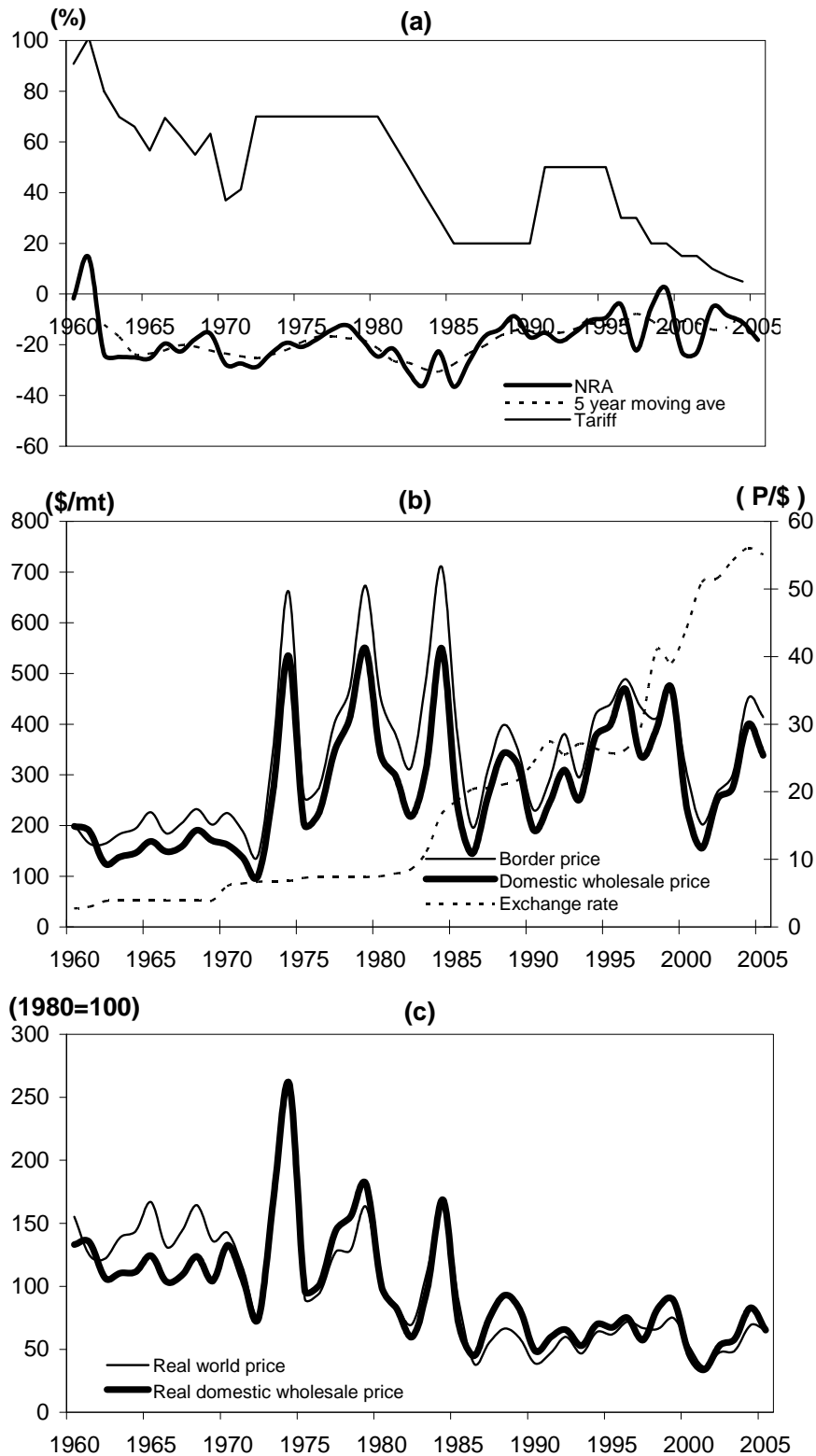
Appendix Figure A2: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Maize**, 1960-2004



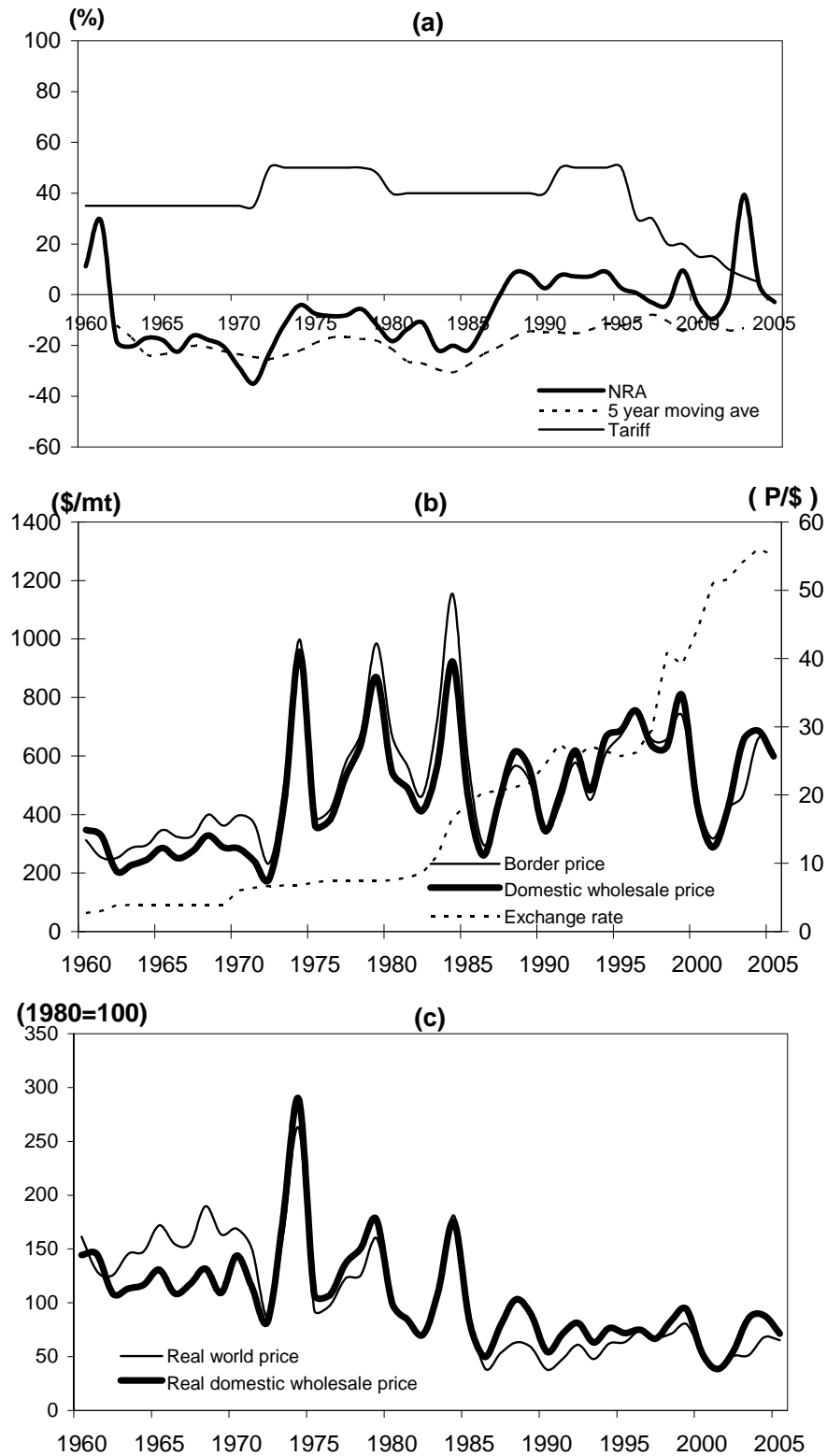
Appendix Figure A3: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Sugar**, 1960-2004



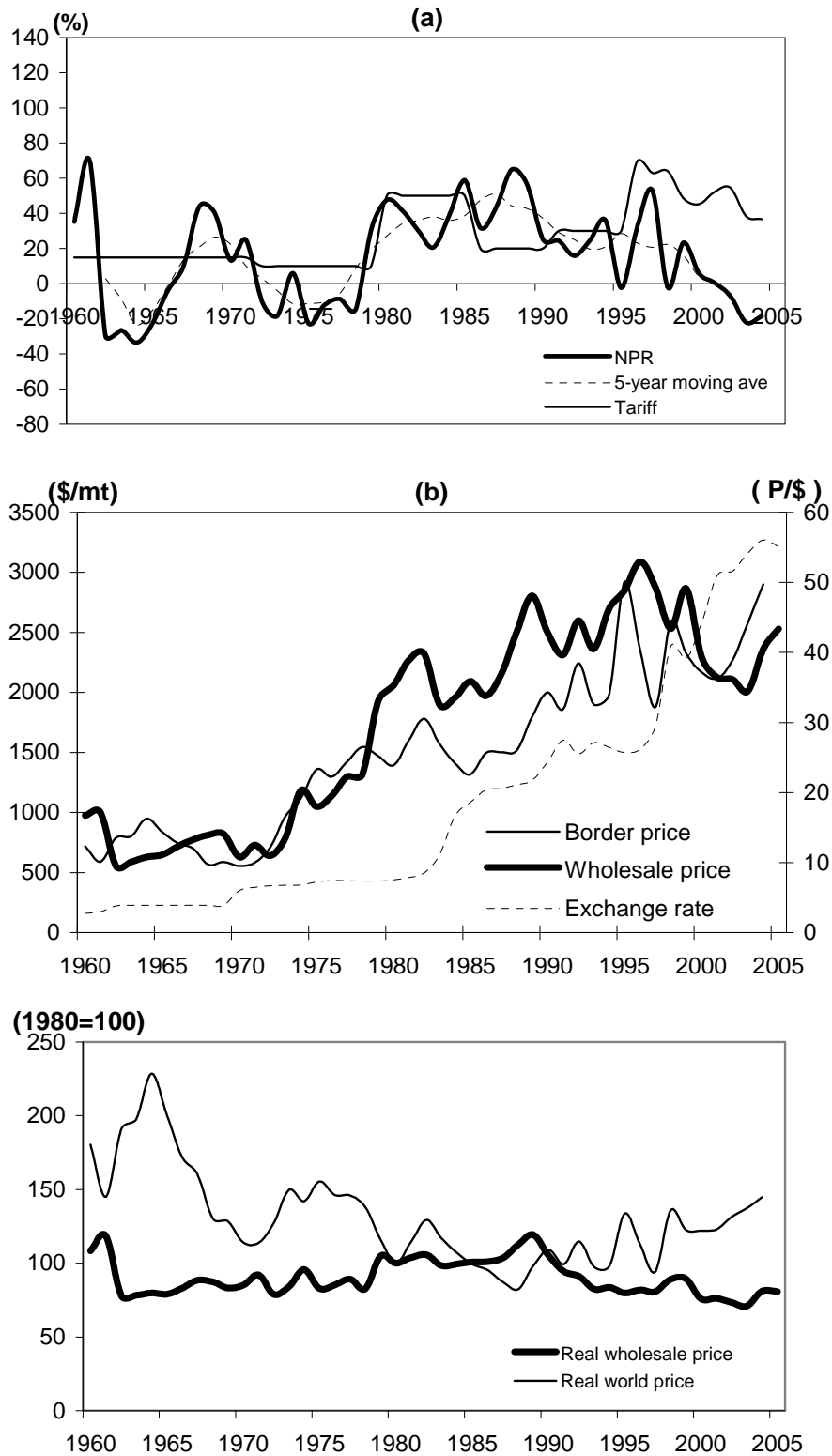
Appendix Figure A4: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Coconut**, 1960-2004



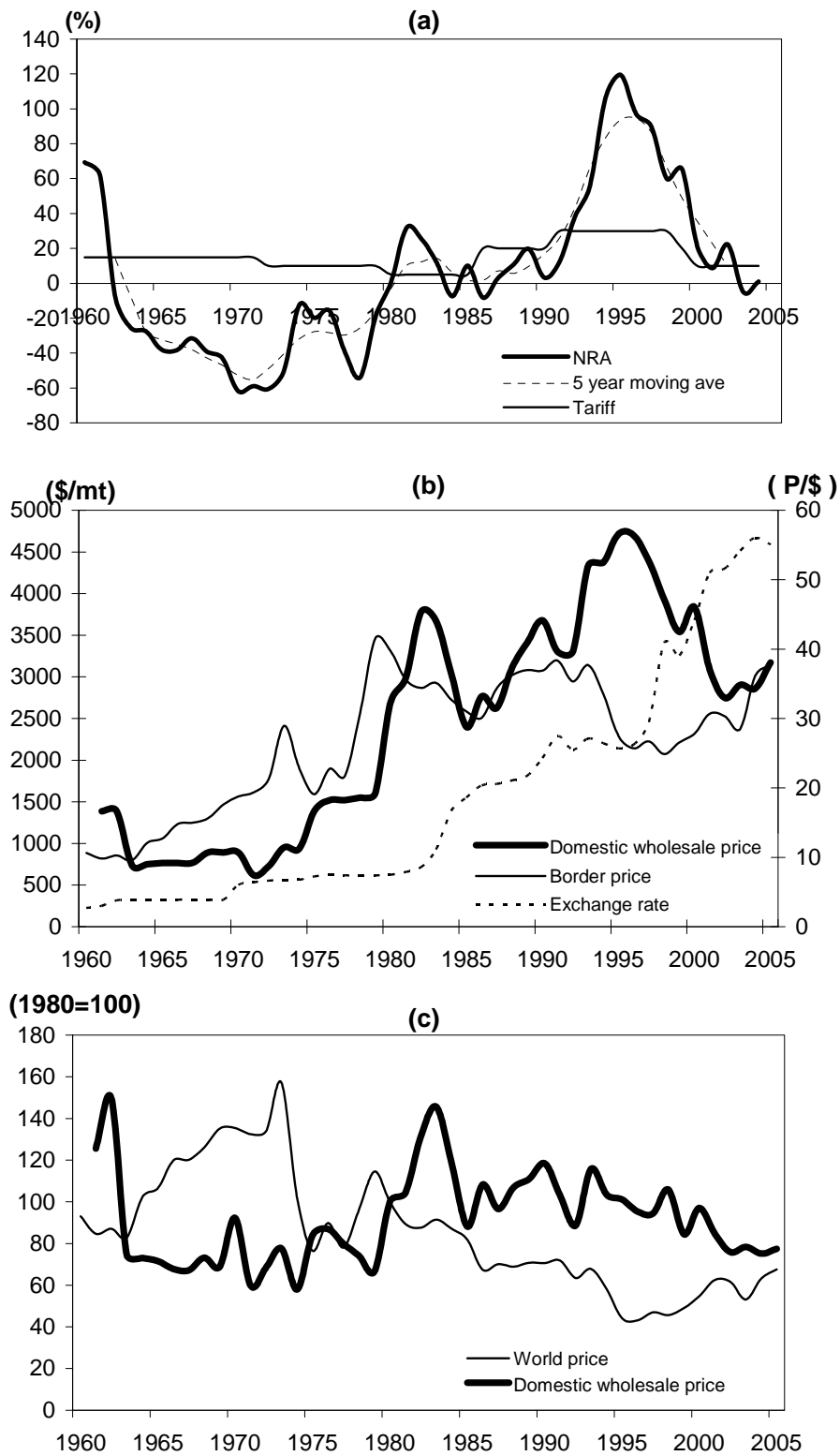
Appendix Figure A5: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Coconut Oil**, 1960-2004



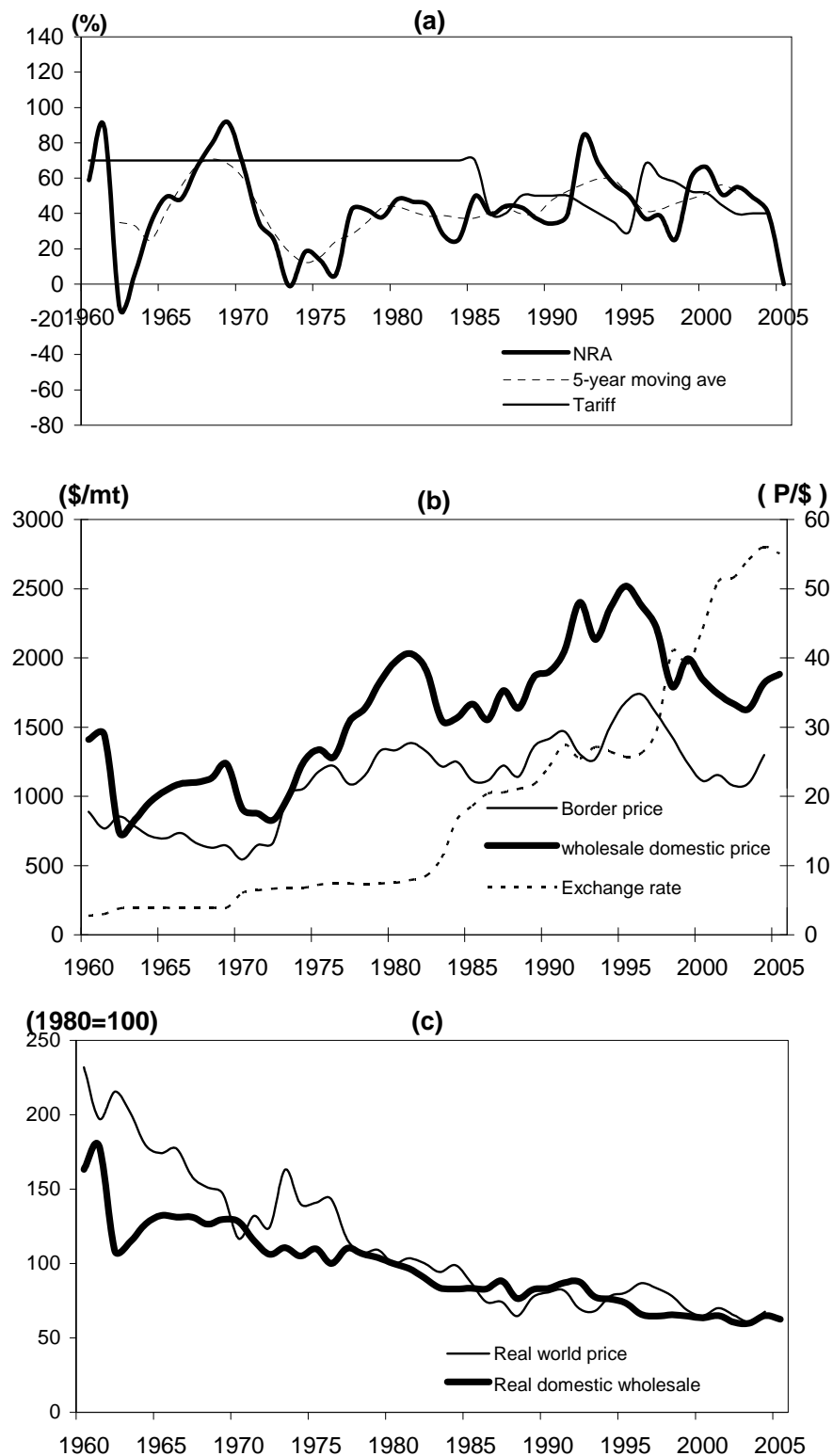
Appendix Figure A6: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Pigmeat**, 1960-2004



Appendix Figure A7: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Beef**, 1960-2004

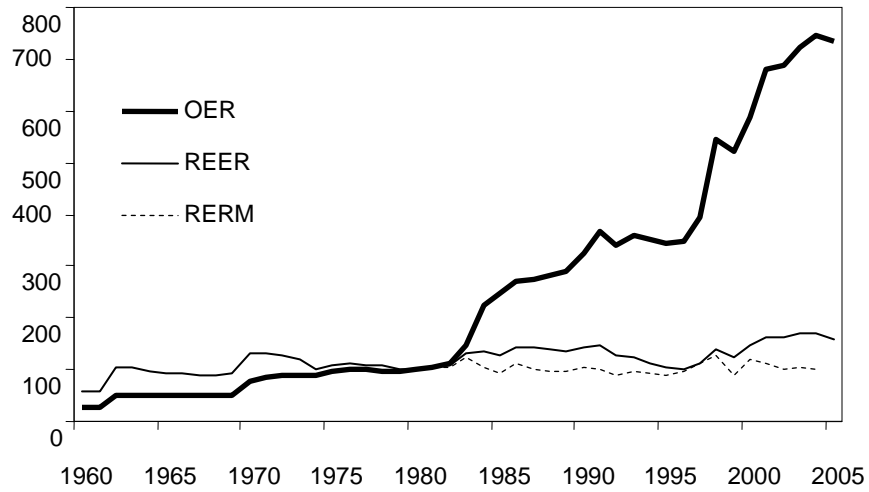


Appendix Figure A8: Trends in (a) nominal rates of assistance and import tariffs, (b) domestic wholesale price, border price and exchange rate, and (c) indices of real domestic wholesale and world price, **Poultry**, 1960-2004





Appendix Figure A9: Trends in the official exchange rate (OER), real effective exchange rate (REER), and real exchange rate misalignment (RERM), Philippines, 1960 to 2005



Source: Authors' estimates

Appendix Table A1: Distribution of gross value added in agriculture by major commodities at current and constant prices, Philippines, 1960 to 2004  
(percent)

	1960	1970	1980	1990	2000	2004
<b>Crops</b>	<b>69</b> (77)	<b>77</b> (79)	<b>82</b> (83)	<b>74</b> (75)	<b>73</b> (69)	<b>70</b> (68)
Rice	- -	17 (23)	16 (20)	21 (22)	21 (23)	20 (24)
Maize	- -	6 (9)	7 (8)	9 (10)	6 (7)	7 (8)
Coconut	- -	13 (13)	11 (12)	7 (6)	5 (4)	5 (5)
Sugar	- -	8 (7)	6 (5)	4 (3)	3 (3)	3 (4)
Banana	- -	3 (2)	3 (4)	3 (2)	4 (3)	5 (3)
Other crops	- -	30 (25)	38 (33)	30 (32)	34 (28)	30 (25)
<b>Livestock</b>	<b>31</b> (23)	<b>23</b> (21)	<b>18</b> (17)	<b>26</b> (25)	<b>27</b> (31)	<b>30</b> (32)
Poultry	- -	4 (5)	7 (7)	9 (11)	10 (14)	11 (15)
Other livestock	- -	18 (17)	10 (10)	16 (15)	16 (17)	17 (17)

Figures in parentheses are percentage shares at constant prices.

Source of basic data: National Statistical Coordination Board

Appendix Table A2: Consumer tax equivalent of import protection on agricultural inputs, Philippines, 1960 to 2004 (percent)

	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
Fertilizers <sup>a</sup>									
Urea	49	55	-13	28	21	11	5	3	3
Ammophos	17	32	-9	54	19	15	12	3	3
Pesticides <sup>b</sup>	24	24	29	35	35	20	16	7	3
Tractors <sup>b</sup>									
2 wheel	24	20	21	46	46	30	28	10	3
4 wheel	24	20	21	24	24	12	10	10	3
Threshers <sup>b</sup>	24	24	24	24	24	30	22	10	3
Water pumps <sup>b</sup>	46	46	46	46	46	30	24	10	3

<sup>a</sup> Based on price comparison, i.e., the percentage difference between the ex-warehouse price and the CIF import unit value.

<sup>b</sup> Based on book tariff rates. Implicit tariff from 1960-84 includes the import tariff and advance sales tax (10 percent and 25 percent) mark-up respectively. The advance sales tax was abolished in 1986 and hence the implicit tariffs from 1985 onward includes only the tariff rate.

Sources: Tariff Code of the Philippines (various issues) and Fertilizer and Pesticide Authority

Appendix Table A3: Trends in nominal rate of assistance to non-agricultural industries, Philippines, 1967 to 2004

	1965- 69	1970- 74	1975- 79	1980- 84	1985- 89	1990- 94	1995- 99	2000- 04
<b>All non-agriculture</b>	<b>20</b>	<b>16</b>	<b>16</b>	<b>13</b>	<b>8</b>	<b>9</b>	<b>8</b>	<b>7</b>
Other primary industries	0	-3	1	2	4	7	0	0
Food manufacturing	20	8	0	-3	3	7	16	21
Lightly processed	16	-1	-9	-7	1	7	19	28
Heavily processed	25	26	22	11	7	7	9	8
Other manufacturing	29	31	33	26	13	12	6	3

Source: Authors' estimates

Appendix Table A4: Estimated effective protection rates for major economic sectors, Philippines, 1974 to 2004 (percent)

	Agriculture	Manufacturing	All Sectors
Tan, N. (1979)			
1974	9	44	36
Tan, E. (1994)			
1983	10	79	53
1985	9	74	49
1986	5	61	40
1988	5	56	36
Manasan and Pineda (1999)			
1990-94	26	32	29
1995-99	26	24	21
2000	24	19	18
Aldaba (2005)			
1998	19	7	9
1999	18	6	8
2000	16	6	7
2001	17	6	7
2002	14	5	6
2003	14	5	6
2004	15	5	6

Sources: Tan (1979), Tan (1994), Medalla et al. (1995), Manasan and Pineda (1999), Aldaba (2005)

Appendix Table A5: Nominal rates of assistance to covered agricultural products, Philippines, 1962 to 2004

	(percent)								
	Rice	Maize	Beef	Pigs	Chicken	Coconut	Banana	Sugar	All covered
1962	-18	-14	15	-30	-13	-24	0	38	-9
1963	-6	8	15	-27	6	-25	0	-39	-4
1964	14	8	15	-34	34	-25	0	-24	7
1965	10	42	15	-23	49	-25	0	103	20
1966	12	29	15	-4	48	-20	0	157	23
1967	-5	39	15	10	66	-23	0	134	14
1968	-14	44	15	44	80	-18	0	142	9
1969	-10	38	15	40	92	-16	0	67	11
1970	-8	-10	15	13	67	-28	-4	38	3
1971	29	49	15	25	35	-27	-4	16	21
1972	23	43	10	-10	25	-29	-4	-31	6
1973	-39	-8	10	-18	-1	-23	-4	-48	-29
1974	-53	-3	10	6	18	-19	-4	-34	-33
1975	-29	6	10	-23	13	-21	-4	-44	-21
1976	0	22	10	-12	5	-18	-4	-19	-4
1977	-4	41	10	-9	42	-14	-4	14	2
1978	-32	37	10	-15	42	-12	-4	24	-9
1979	-24	16	10	31	38	-18	-4	16	-9
1980	-38	25	5	48	48	-25	-4	-18	-19
1981	-36	28	5	42	46	-21	-4	-15	-17
1982	3	42	5	30	44	-31	-4	73	9
1983	-10	-2	5	21	27	-36	-4	64	-5
1984	0	7	5	39	26	-23	-4	193	7
1985	43	41	5	59	50	-37	-4	273	21
1986	26	62	20	32	40	-27	0	114	22
1987	11	96	20	43	44	-17	0	126	22
1988	-9	46	20	65	43	-14	0	70	6
1989	2	54	20	56	37	-9	0	33	10
1990	16	51	20	25	34	-17	0	29	12
1991	1	24	30	24	39	-15	0	56	6
1992	21	88	30	16	84	-19	0	75	21
1993	46	69	30	24	68	-15	0	51	28
1994	21	82	30	36	57	-10	0	35	19
1995	55	94	30	-2	50	-9	0	80	36
1996	71	48	30	31	37	-4	0	80	47
1997	63	84	30	53	39	-22	0	60	45
1998	21	66	30	-2	25	-5	0	95	20
1999	53	100	20	23	60	2	0	171	41
2000	73	96	10	6	66	-23	0	77	39
2001	69	72	10	0	51	-23	0	67	36
2002	54	45	10	-7	55	-5	0	105	27
2003	41	25	10	-22	49	-8	0	84	15
2004	17	35	10	-19	40	-11	0	64	7

Source: Authors' spreadsheet.

Appendix Table A6: Nominal and relative rates of assistance to all<sup>a</sup> agricultural products, to exportable<sup>b</sup> and import-competing<sup>b</sup> agricultural industries, and relative<sup>c</sup> to non-agricultural industries, Philippines, 1962 to 2004

(percent)

	Total ag NRA				Ag tradables NRA	Non-ag tradables NRA		RRA
	Covered products		Non- covered products	All products (incl NPS)				
	Inputs	Outputs						
1962	0	-9	-3	-8	-8	19	-23	
1963	0	-4	-1	-3	-3	19	-19	
1964	0	7	3	6	7	19	-10	
1965	0	20	8	17	19	19	0	
1966	0	23	8	19	21	22	-1	
1967	0	14	5	12	13	20	-6	
1968	0	9	4	8	9	19	-9	
1969	0	11	4	10	10	21	-9	
1970	0	3	1	3	3	20	-14	
1971	0	21	8	18	19	24	-4	
1972	0	6	2	5	5	15	-9	
1973	0	-29	-11	-25	-27	11	-35	
1974	0	-33	-12	-29	-31	10	-37	
1975	0	-21	-8	-18	-20	13	-29	
1976	0	-4	-1	-3	-3	17	-17	
1977	0	2	2	2	2	18	-13	
1978	0	-9	-3	-7	-8	17	-21	
1979	0	-9	-2	-7	-8	17	-22	
1980	0	-19	-7	-16	-17	16	-29	
1981	0	-17	-6	-14	-15	13	-25	
1982	0	9	7	8	9	13	-3	
1983	0	-5	1	-4	-4	11	-14	
1984	0	7	7	7	8	12	-4	
1985	0	21	17	20	22	12	9	
1986	0	22	12	19	21	10	10	
1987	0	22	11	19	21	11	9	
1988	0	6	4	6	6	13	-6	
1989	0	10	5	9	10	9	0	
1990	0	12	7	11	12	11	1	
1991	0	6	3	6	6	9	-3	
1992	0	21	10	19	20	11	9	
1993	0	28	13	25	27	9	17	
1994	0	19	8	17	18	10	8	
1995	0	36	15	32	34	7	26	
1996	0	47	19	41	44	8	33	
1997	0	45	20	39	42	9	31	
1998	0	20	8	17	19	8	10	
1999	0	41	18	36	39	11	25	
2000	0	39	17	34	37	9	25	
2001	0	36	15	32	34	8	24	
2002	0	27	11	24	26	7	18	
2003	0	15	6	14	15	5	10	
2004	0	7	3	6	6	3	3	

<sup>a</sup> NRAs including assistance to nontradables and non-product specific assistance.

<sup>b</sup> NRAs including products specific input subsidies.

<sup>c</sup> The Relative Rate of Assistance (RRA) is defined as  $100 * [(100 + \text{NRA}_{\text{ag}}^t) / (100 + \text{NRA}_{\text{nonag}}^t) - 1]$ , where  $\text{NRA}_{\text{ag}}^t$  and  $\text{NRA}_{\text{nonag}}^t$  are the percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively.

Source: Authors' spreadsheet

Appendix Table A7: Value shares of primary production of covered and non-covered products,<sup>a</sup>  
Philippines, 1962 to 2004

	(percent)									Non-
	Rice	Maize	Sugar	Beef	Pigs	Chicken	Coconut	Banana	Covered	covered
1962	39	9	3	7	12	5	3	5	77	23
1963	39	10	4	4	13	4	3	5	77	23
1964	36	9	6	4	14	4	3	5	77	23
1965	36	9	7	4	14	4	3	5	77	23
1966	38	9	6	4	14	5	2	4	78	22
1967	44	7	6	4	13	4	3	4	80	20
1968	46	7	6	3	10	3	3	4	79	21
1969	40	8	11	3	9	3	3	5	77	23
1970	32	12	13	4	11	3	3	4	77	23
1971	32	12	16	3	12	3	3	6	80	20
1972	28	9	18	3	12	2	4	4	76	24
1973	35	10	17	2	8	2	4	2	78	22
1974	42	11	11	3	6	1	5	3	79	21
1975	30	10	16	2	7	1	9	3	76	24
1976	26	10	15	2	6	1	13	2	74	26
1977	26	7	10	2	9	1	15	2	71	29
1978	29	7	7	3	9	1	15	3	71	29
1979	26	7	9	2	7	1	22	4	74	26
1980	29	7	11	4	6	1	14	4	71	29
1981	30	7	11	3	6	1	12	3	71	29
1982	26	8	9	4	8	1	15	4	72	28
1983	24	9	7	4	8	1	17	4	70	30
1984	22	9	5	3	10	1	23	4	73	27
1985	24	11	4	3	7	1	25	4	74	26
1986	25	10	6	3	10	1	15	5	69	31
1987	27	8	5	3	10	1	15	4	71	29
1988	28	9	7	3	9	1	18	5	74	26
1989	28	8	9	3	10	1	13	4	73	27
1990	24	9	9	3	12	2	14	4	73	27
1991	37	7	6	3	12	1	11	4	77	23
1992	32	7	7	3	14	1	13	4	77	23
1993	30	7	8	4	14	1	13	4	77	23
1994	37	6	7	3	12	1	11	5	77	23
1995	34	6	6	3	19	1	9	4	78	22
1996	34	7	6	4	14	2	10	4	77	23
1997	34	6	6	4	13	2	11	5	76	24
1998	29	5	5	5	17	2	11	4	74	26
1999	33	5	3	6	15	2	12	6	76	24
2000	31	6	5	8	18	2	9	5	78	22
2001	31	6	7	7	20	2	7	5	79	21
2002	31	6	4	5	22	2	9	5	80	20
2003	30	6	5	5	24	1	8	5	79	21
2004	32	6	4	4	22	1	11	4	79	21

<sup>a</sup> At farmgate undistorted prices.

Source: Authors' spreadsheet