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Philippine Institute for Development Studies Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

Monitoring and Evaluation of Agricultural Policy Indicators

Cristina C. David, Roehlano M. Briones, Arlene E. Inocencio, Ponciano S. Intal, Jr., Ma. Piedad S. Geron, and Marife M. Ballesteros **DISCUSSION PAPER SERIES NO. 2012-26**

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For comments, suggestions or further inquiries please contact: The Research Information Staff, Philippine Institute for Development Studies

5th Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines Tel Nos: (63-2) 8942584 and 8935705; Fax No: (63-2) 8939589; E-mail: publications@pids.gov.ph Or visit our website at http://www.pids.gov.ph

Monitoring and Evaluation of Agricultural Policy Indicators

Philippine Institute of Development Studies

based on contributions by: Cristina C. David Roehlano M. Briones Arlene E. Inocencio Ponciano S. Intal Piedad S. Geron Marife M. Ballesteros

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Abstract: This study proposes a set of indicators for monitoring and evaluation of agricultural policy, patterned after the support estimates of the Organization for Economic Cooperation and Development (OECD). The main indicators are: producer support (incorporating indirect market support, and direct input support through irrigation, credit, and land transfer); general services support; and public expenditures for agriculture. The study finds that these indicators are viable measures of public support and may be consistently updated over time. Past trends in policy indicators suggest that price policy played the biggest role in agricultural support. Low to negative support to agriculture up to the late 1980s was due largely to indirect taxation of agriculture. From the 1990s onward though the protection structure swung in favor of agriculture resulting in expanding producer support, further enhanced by increasing budgetary outlays for agriculture, mostly towards provision of private goods (such as fertilizer subsidies). These patterns suggest resource misallocation, which may be remedied by rationalizing price policy as well as budgetary allocation from agricultural support services of DA (and land acquisition by DAR), towards provision of public goods such as R&D, extension, regulation, and participatory irrigation investments.

Keywords: agricultural support, price policy, public goods

Table of Contents

Montoring and Evaluation of Agricultural Folicy indicators Main	
Report	1
Main Report: Tables and Figures	25
Annex 1. Details on the Methodology	42
Annex 2.1. The National Food Authority	57
Annex 2.2. MEAP: Rice Prices and the National Food Authority	72
Annex 3. Irrigation	176
Annex 4.1. Land Redistribution	190
Annex 4.2. The Cost of Redistributive Land Reform in the Philippines	202
Annex 5. General Services Support	249
Annex 6. The Impact of Agricultural Support Policy in the Philippines: A Review of	
Equilibrium Models	270
Annex 7. Thoughts on the Institutionalization of the MEAP	286
	Report. Main Report: Tables and Figures. Annex 1. Details on the Methodology. Annex 2.1. The National Food Authority. Annex 2.2. MEAP: Rice Prices and the National Food Authority. Annex 3. Irrigation. Annex 4.1. Land Redistribution. Annex 5. General Services Support. Annex 6. The Impact of Agricultural Support Policy in the Philippines: A Review of Equilibrium Models. Annex 7. Thoughts on the Institutionalization of the MEAP.

1. INTRODUCTION

For the Philippines, agricultural growth has been slow and erratic since the 1980s. Previous studies have argued that poor agricultural performance has been caused largely by weaknesses in the sector's policy and institutional framework (David 2003; Balisacan et al 2004). A clear understanding and timely evaluation of agricultural policies and programs would be invaluable for informing an efficient policy and institutional framework for the sector.

Because of its unique features, agriculture is riddled with market failures. The private sector will tend to under-invest in key factors that could accelerate agricultural growth, such as research and development, irrigation, and market infrastructure. Such activities are generally characterized by public good attributes, strong economies of scale and scope, and long gestation periods. To address market failures, alleviate poverty, and achieve other developmental and social goals in the sector, the public sector finances the design, implementation, monitoring, and evaluation of a wide variety of public investments, regulations, institutional mechanisms, and other policy instruments.

Efficiency and effectiveness of governance of the agricultural sector depend not only on the level and functional allocation of budgetary support, but also on other dimensions of budgetary structures and processes, as well as organizational and other institutional factors. Specifically, we examine the allocation of budgetary outlays between policy instruments that enhance productivity versus those that are primarily redistributive; and between those that provide public (such as research and development) versus private goods and services (such as fertilizer and seed subsidies).

Policy support for agriculture is evaluated based on a set of measures of producer support over the period 1960-2008. The long time frame permits a wider perspective on the causes and consequences of agricultural policies. The measurement methodology draws from a recently completed World Bank multi-country study on distortions to agricultural incentives (Anderson and Martin, 2009) and the OECD indicators of agricultural support (OECD, 2008) which is periodically updated for its member countries. The measurement of agricultural support in its various forms is a sort of a prism by which to evaluate the size and even efficiency of resource allocation towards agriculture relative to a minimal- or no-intervention counterfactual.

The objectives of this report are as follows:

1

- to develop a comprehensive set of quantitative agricultural policy indicators to monitor and evaluate the extent of price distortions in agriculture, the level and composition of public expenditures, and the magnitude of resource transfers to producers from agricultural expenditures and policies;
- ii) review the country's agricultural policies, in terms of goals sought and policies adopted, covering key macroeconomic factors and policies affecting production incentives in agriculture, and the major agricultural policy developments since 1986;
- analyze support to agriculture, based on the policy indicators developed in objective i),
 based on the policy goals sought, and suggest alternative configurations of agricultural
 policies that could secure attainment of these goals.

A corollary aim is to clearly document, for the Philippine case, the empirical methodology, sources and limitations of data, and directions for improving the estimation of the policy indicators and the availability of budgetary and other relevant data for the eventual institutionalization of the monitoring and evaluation of these agricultural policy indicators. The systematic collection of the basic data and estimation of these agricultural policy indicators, coupled by their easy and timely access to the research community, bureaucracy, and policymakers, may contribute towards rigorous agricultural policy analysis and modeling, as well as transparency and better governance of the sector.

The methodology for calculating the indicators is presented in the second section. The third section discusses the policy environment affecting production incentives, followed by an analysis of trends in agricultural price distortions as well as market price support. The fourth section examines the trends in the level of total public expenditures in agriculture and the changes in the composition by policy instruments. The fifth section synthesizes the findings on agricultural price distortions and public expenditure, and presents directions for alternative policy and related institutional reforms for achieving the country's policy goals.

2. METHODOLOGY

This study a set of indicators patterned closely after the OECD measures of agricultural support, but with some important modification to suit the Philippine setting. The following

outlines the concepts behind the estimation of agricultural support indicators; details, covering data sources, processing, and methodological issues, are found in Annex 1.

Agricultural support is broadly divided into producer support estimates (PSE) and general services support estimates (GSSE). Each set of estimates is discussed separately below. The OECD suggests a total agricultural support indicator obtained from adding together PSE and GSSE. However, in our consolidated evaluation of agricultural support, we simply compare the relative magnitudes of the PSE and GSSE over time, rather than taking the sum, which is not a meaningful exercise for this study as the two sets of estimates are not commensurate.

Producer support

PSE combines market support through output and input prices, whether indirect (such as non-tariff barriers) or direct (such as payments for output, area planted, or subsidies on input prices). For the Philippine the relevant components of PSE are: output price or *market price support*, and input price support. Unlike in the OECD, the Philippines has not provided direct payments for production-related measures (such as output, area planted, and so on).

Market price support

The market price support component of PSE is obtained by taking the difference between domestic price (P_d) and border price (P_b) created by trade and other price intervention policies, expressed as the *nominal protection rate* or *NPR*:

$$NPR = \left(\frac{P_d - P_b}{P_b} - 1\right) * 100$$

The *NPRs* are approximated by the nominal rate of assistance in David et al (2009), which was computed over the period 1960-2004. Denote value of production by *VP*, then market price support *MPS* is calculated as follows:

$$MPS = VP - \frac{VP}{1 + NPR} \, .$$

The total MPS refers to the whole agriculture sector, with only very minor livestock products being omitted. The relative annual average MPS across commodities depends on the

degree of price distortion or the nominal protection rate and the relative importance of the commodity to the total value of agricultural production.

Price incentives faced by farmers are also affected indirectly by the nominal rates of protection to non-agricultural production. When these are higher than those in agriculture, then mobile resources will tend to shift to non-agriculture, and conversely when the NPR is higher in agriculture compared to non-agriculture. To take account of these indirect effects, the relative rate of protection or *RRP* is computed as follows:¹

$$RRP = \frac{1 + NPR_{ag}}{1 + NPR_{nonag}} - 1$$

Input support: irrigation

For irrigation, we attempted to estimate the input use support provided by national irrigation systems (NIS), which accounts for at least 85 percent of total public expenditures for irrigation (David and Inocencio 2010). Conceptually, assuming cost-effective design and implementation of irrigation projects, this is equal to the difference between the government cost of supplying that irrigation water and the irrigation service fees paid by farmers. We focus on the financial cost of constructing, operating, and maintaining the NIS. The net annualized cost of irrigation service from system i in year t (*ISUS*) is estimated as the difference between the annualized cost of irrigation service (*AC*) and the irrigation service fees (*RISF*) paid by farmers:

(1)
$$ISUS_{it} = AC_{it} - RISF_{it}$$

On the other hand, AC is the sum of the annualized cost of capital stock (AK) and the expenditures for operation and maintenance (EOM).

$$(2) \qquad AC_t = AK_t + EOM_t$$

Finally, AK is estimated by the equivalent annualized cost of the capital stock associated with an irrigation system of a fixed lifetime *N*:

(3)
$$AK_t = \frac{r(1+r)^N}{(1+r)^N - 1}K$$

where:

K= the financial cost of the stock of irrigation system

r = the interest rate

The cost of capital is estimated by simply cumulating the capital outlays per year over the construction period of the system. Ideally, one should apply the interest rate over the construction period (as in Gulati, Meinzen-Dick, and Raju, 2005). Our method is intended to offset the likely overpricing of construction costs (owing to governance problems) as well possible inefficiencies in the design, construction, and operation of the irrigation systems. It should be noted that the support payment aims at valuing the transfer received by farmers, which may be smaller than the opportunity cost of resources involved in making the transfer (including the cost of capital).

Various studies generally show that the performance of NIS has been much less favorable than projected; operation and maintenance typically fails to distribute water efficiently and equitably; and irrigation systems are rapidly deteriorating (Annex 3). Overestimation of available water supply during appraisal and other design mistakes, deterioration of watersheds, siltation of river systems and irrigation canals explain the accelerated deterioration of NIS.

The generally poor performance of large gravity systems over the past several decades may be observed in most Asian countries (Barker et al 2010; David 2004; Plusquellec 2002). Many studies blame unaccountable or inefficient bureaucracies, but Barker et al contend that the underlying reason is the fact "that many of the socio-technical preconditions that made gravity flow irrigation sustainable in the past no longer exist". Among these are the growing scarcity of water as a resource, greater concern about environmental impacts, shift in demand for irrigation away from rice to high valued crops, technological developments in pump irrigation, and so forth.

Input support: land redistribution

Also estimated under the input price support method is the resource transfer arising from the redistribution of agricultural land ownership from the relatively large landowners to tenant farmers and other beneficiaries. Agrarian reform has been historically among the most important agricultural development programs implemented by a series of administrations. The resource transfer is estimated by the imputed rental value of the land transferred to farmer beneficiaries, net of amortization payments. This is based on the principle that, at land market equilibrium, the price of land is equal to the discounted present value of the future stream of net benefits of ownership in perpetuity (e.g. Melichar 1979; Shalit and Schmitz 1982; Jatileksono and Otsuka 1993). In turn, the annual stream of benefits can be represented by the annual rental earnings from the land (Robison, Lin, and VenKataraman 1985). The rental value per hectare is estimated as the factor share of land multiplied by annual value of production (which would vary by crop).

We do not some limitations of our method. The size of benefit is qualified by the finality of property right transfer. (See Annex 4 for a more comprehensive discussion). Under CARP, transfer takes the form of a Certificates of Land Ownership Award (CLOA). The CLOA automatically carries an encumbrance owing to on-going amortization payment. Hence, for instance, the land cannot be resold without full payment of the principal; there is, however, a tenyear proscription period immediately after the award of the CLOA, within which land cannot be sold, conveyed, or leased, but can only be transferred by inheritance.

Second, CLOAs issued to individual beneficiaries need to be distinguished from CLOAs issued for a group of farmers. About half of redistributed lands under CARP are reportedly still under group CLOAs. While the latter formally signifies government's approval of land ownership rights of a group of farmers, the market value of such a collective right is lower than individually titled land of the same size.

Third, EPs and CLOAs have been often issued even before amortizations have been fully paid by farmer beneficiaries and before landowners have received payment from the Land Bank. Yet, the Supreme Court has ruled that land ownership cannot be transferred to farmer beneficiaries until original landowners have received full payment. Therefore, effective accomplishment under OLT, CA, and GFI may be overstated by official figures, as many landowners continue to contest coverage and/or land valuation. In addition, bureaucratic constraints have delayed processing of claims at the LBP.

Other input support

Strictly speaking the OECD method pertains to gross transfers to producers. From a resource allocation perspective, a more complete measure of distortions affecting producer incentives is the effective rate of protection, based on value added. However, estimation of value added by commodity over an extended time series in not feasible. Rather, the NPRs for

agricultural products shall be compared with the implicit tariff for tradable inputs; owing to data limitations, this is equated to implicit tariff for fertilizers. Note that the analysis of budgetary outlays for agricultural inputs will simply be included as part of the policy indicators related to GSSE below.²

Government services support

The GSSE is equal to the annual monetary value of gross transfers to general services provided to agricultural producers collectively and not to any individual producer, arising from policy measures that support agriculture. In the OECD methodology, this consists of budgetary outlays for public stockholding, infrastructure, research and development, agricultural schools, inspection services, marketing and promotion, and miscellaneous. In contrast to price policy interventions under producer support, GSSE is a major component of explicit outlays by the public sector on agriculture, or *public expenditures for agriculture* as defined by the Department of Budget and Development (DBM).

Public expenditures for agriculture cover the annual obligated funds of the Department of Agriculture (DA) and its attached agencies and government corporations, such as the National Irrigation Authority (NIA), the National Food Authority (NFA), and so on; the Department of Agrarian Reform (DAR); Land Bank of the Philippines (LBP) budget from the Agrarian Reform Fund (ARF); the Philippine Council for Agriculture and Resources Research and Development (PCARRD) and Philippine Council for Aquaculture and Marine Research and Development (PCAMRD) of the Department of Science and Technology (DOST).

To this we add expenditures of two other groups of institutions, namely: that is, (a) appropriations for research and extension by the University of the Philippines at Los Baños (UPLB) and 11 other major state colleges and universities (SCUs) at the national level; and (b) beginning in 1992, the expenditures for agriculture and veterinary services of provinces, cities, and municipalities or local government units (LGUs). Lastly, we exclude allocations for the NFA to avoid overstating benefits to the agricultural sector from NFA activities. Our analysis suggests that the benefits of NFA expenditures were captured mostly by (some) consumers, rather than agricultural producers (see Annex 2). Benefits to producers were almost entirely due to the exercise of the rice import monopoly by the NFA, which have already been captured under market price support above.

To isolate GSSE from GA, we would need to remove the items related to irrigation (those related to NIA), as well as items related to land acquisition and distribution under DAR and ARF. The reason is that these expenditures serve as "inputs" as it were to the resource transfers in the form of irrigation services and land rental savings, which are already valued under the input price support component of PSE. Nevertheless, we find that discussion of agricultural policy is insightful in relation to GA, rather than only to GSSE; we therefore maintain the broader category in the discussion, while keeping in mind its overlap with PSE and distinction from GSSE.

The main policy instruments under public expenditures for agriculture at the national level are: i) research, development, extension, and regulatory services or RDER; ii) production support; iii) other support. In this study, we distinguish between "producer support" discussed above, from "production support", based on Philippine government usage. The latter covers budgetary outlays for rural credit, market infrastructure, postharvest equipment and facilities, seeds, fertilizers, farm machineries, integrated development projects, and other production support. The category "all others" consists of market promotion, agricultural statistics, policy and planning, and other support services.

3. RESOURCE TRANSFERS TO PRODUCERS

Background

The economy has undergone the expected structural transformation over the course of its development, albeit at a relatively slow pace. The contribution of agriculture to GDP fell from 30 percent (1960) to 15 percent by 2008. Likewise, its share of the sector in total employment dropped steadily from 61 to 35 percent from 1960 to 2008. However, unlike the rapid industrialization that characterized economic growth among the Asian tigers, the share of industry in the country stagnated at about one-third over the period. Services have evolved as the largest sector, accounting for nearly half of the economy by 2008.

Economic development has been constrained by an import substitution industrialization strategy, which dominated economic policies up to the late 1970s. These policies defended an overvalued peso and thus clearly penalized exports and agriculture. Under authoritarian rule from the 1970s onwards, tariff protection was raised on many import-competing products, such

as primary and processed food and agricultural products, chemical products, metal manufactures, electrical appliances, machinery and transport equipment. The average tariff rate eventually exceeded those of its Southeast Asia neighbors (Intal and Power 1991).

The protectionist regime resisted all efforts at reform until the restoration of democracy in 1986. However, the series of unilateral trade liberalization measures introduced since the late 1980s has left the price and trade protection conferred on most major import-competing agricultural products largely untouched. Despite agreements under the World Trade Organization (WTO) and other regional trade agreements, non-tariff trade barriers continue to distort the domestic prices of major agricultural commodities.

Average annual growth rates in the GVA of major agricultural commodities have been quite erratic (Table 1). The crop sector grew rapidly prior to 1980 because of the Green Revolution in rice and the world commodity boom, but it performed poorly thereafter, when the average growth rate was far below the growth rate of population. This general slowdown may be observed across commodities.

Table 1

Rice is the main staple and the single most important crop. Rice continuous to receive the bulk of public expenditure in the sector and it has also benefited from increasing price protection (David and Inocencio 2000; World Bank 2007; David et al 2009). Rice imports as a share of the total supply of rice have risen since the 1980s, reflecting the effect of rising incomes and a shift away from corn as food staple in the southern regions of the country. Corn production experienced declining growth rates despite rising price protection. Traditional export crops such as coconuts, sugar, abaca, and tobacco, performed relatively poorly, compared with non-traditional export crops such as bananas, pineapples, and mangoes.

The slower growth of agriculture in the Philippines compared to other developing Asian countries and the stagnation of agricultural exports suggest that the country has been losing its comparative advantage in the sector. Indeed, the index of revealed comparative advantage which measures the extent to which the share of agricultural and food products in an economy's merchandise trade exceeds the global average share of these products, decreased sharply for agriculture as a whole, and for all major agricultural exports (Table 2). The country's share of the world market in coconut products has fallen. Sugar began to be imported, as exports to the preferential U.S. market garnered higher than world market prices. Even for non-traditional

exports such as bananas and pineapples, the Philippine shares in world markets have declined since the mid-1980s.

Table 2

Agricultural policy since 1986

Under the democratic government, the country adopted a new Constitution in 1987, which provides for "industrialization and full employment based on sound agricultural development and agrarian reform". It likewise mandates the State to undertake, by law, "an agrarian reform program founded on the right of farmers and regular farmworkers, who are landless, to own directly or collectively the lands they till or in the case of other farmworkers, to receive a just share of the fruits thereof." The Constitution also promotes the decentralization of national functions to local governments.

In practice agricultural development was anchored on a program of modernization, culminating in the enactment of the Agriculture and Fisheries Modernization Act of 1997, and agrarian reform, enacted by law in 1988 (RA 6657). Also influential was the Local Government Code of 1991, which provided for devolution of agricultural extension and decentralized administration of local public goods such as communal irrigation systems, farm-to-market roads, and so on. The Aquino administration was also quick to abolish all policy instruments taxing agricultural exports. These reforms were politically expedient, as revenues from export taxes were associated with rampant cronyism under Martial Law.

On the other hand, it was relatively easy to resist the opening of domestic markets for food staples by playing up the national sentiment for food self-sufficiency. The AFMA elevates *food security* as a key principle of agricultural development, together with *poverty alleviation and social equity, rational use of resources, global competitiveness, sustainable development, people empowerment*, and *protection from unfair competition*. Food security under AFMA may be pursued "through local production or importation or both, based on the country's existing and potential resource endowment and related production advantages." Such apparent flexibility is immediately qualified by the statement: "However, sufficiency in rice and white corn shall be pursued."

Political pressure to raise agricultural protection has also been exerted by lobby groups consisting of farmer organizations, large landowners, and agri-business firms such as livestock

and poultry, millers, seed companies, and the input suppliers. They have been effective as their families and party list groups are at the helm of Congress, and of the national and local executive branches of the government.

In particular, the government's monopoly on rice imports through the NFA have been extremely costly without achieving its basically conflicting objectives of lowering food prices to consumers, raising producer prices, and stabilizing prices (Annex 2). Despite the Aquino government's strong resolve to institute policy reforms in agriculture, it was politically not possible to dismantle the long-standing government trade monopoly on rice and corn by the NFA, as well as quantitative trade restrictions in sugar and other food commodities widely believed to be necessary to attain food self-sufficiency objectives and insulate the country from the volatility of world food prices.

Trends in nominal protection rates

Overall trends in nominal protection rates can be summarized in a few stylized patterns (Table 3). First, import-competing products have been much more highly protected than exportable commodities. In fact, coconut (copra) production has been penalized by negative NPRs over most of the study period, averaging -12 percent from the 1970s to the mid-1980s. Second, the differences in the level of the NPRs are prominent and have widened between two groups of import-competing products: the NPRs for the most important commodities - rice, corn, and sugar - have increased, while those for the many minor, but higher valued commodities have declined.

Table 3

Moreover, the dispersion of NPRs among agricultural products within the farm sector (measured according to the standard deviation of these NPRs) has not diminished. The trade bias index has not diminished either, indicating that the NPRs for importable farm products have persistently remained above the NPRs for exportables (Table 4). Both of these indicators imply that the efficiency of resource use within the farm sector has been substantially compromised by agricultural policies.

Table 4

The NPRs have fluctuated from year to year, mostly in response to world price changes and sometimes to exchange rate adjustments. For example, the NPRs for import competing agricultural products were below the trend in 1973-74, 1980, and in 2007-8, when international prices were high, but above the trend from the mid-1980s to the mid-2000, when international prices were low. This observation strongly suggests that domestic price stabilization is an important objective of agricultural price and trade policy.

Price intervention policies penalized agriculture until the mid-1980s. Since then, average nominal protection rate have increased. In general, countries have shifted from taxing to subsidizing agriculture in the course of development primarily because of political economy factors (Anderson and Hayami 1986). However, the increasingly higher level of NPRs observed since the 1980s may also be partly caused by the government's efforts to reduce the burden of adjustment of the agricultural sector to a long-term decline of world commodity prices.

The wedge between domestic and border prices is due to both tariff and non-tariff barriers. Despite liberalization efforts, book tariffs range from 40 to 65 percent for a range of agricultural products that account for over 65 percent of gross agricultural output (Briones, 2011). Application of these tariffs is however diluted by various trading agreements, including the WTO (which applies lower rates for in-quota tariffs), and regional trading agreements. Nevertheless, for "sensitive" agricultural products, high non-tariff barriers are imposed by way of the import-licensing, permit, and quarantine system. These regulations are *de jure* mechanisms for implementing sanitary and phytosanitary measures rather than explicit quotas (with the exception of rice, for which there is legal sanction from the WTO to maintain quantitative restriction). They are, however, *de facto* applied to stabilize domestic prices even at the cost of restricting trade.³

As a consequence, the average NPR on agriculture is now much greater than the average NPR on non-agriculture; thus, RRAs have risen from an average of around -15 percent prior to the mid-1980s to an average of more than 20 percent in recent years (Table 4). This trend indicates that the efficiency of resource use in farming relative to the production of non-agricultural tradables first increased as RRAs became less negative and then decreased as RRAs became more positive. The above trends are consistent with the series of studies estimating effective rates of protection for the whole tradable sector (Tan 1979; Medalla et. al. 1995; Manasan 1996; Aldaba 2005).

Market price support

Table 5 summarizes the annual average market price support (MPS) by commodity for the whole study period, and for various sub-periods. The long-term rising trend of the ratio of total market price support to total value of production at domestic prices is consistent with the increasing trend in the nominal protection rate of agriculture. The estimates of NPRs are generally higher than the rate of MPS when the latter is positive, but less in absolute value than the rate of MPS when the latter is negative.⁴

Table 5

Annual MPS of agriculture fluctuates widely (Figure 1). The short-run changes in MPS have been largely countercyclical to changes in the level of world prices; that is, MPS decrease when world price in domestic currency go up, and vice versa. That pattern reflects the importance of food price stability as a policy goal and the continuing use of quantitative trade restrictions to insulate the domestic market from world price instability, particularly for the major import competing crops, namely rice, corn, and sugar.

Figure 1

Annual MPS of agriculture declined sharply in the early part of the 1960s and throughout the 1970s up to the early 1980s, as the government adopted policies to insulate consumers from abrupt increases in domestic food prices and capture part of the windfall profits of exporters, as a result of substantial nominal depreciations of the peso and the world commodity boom in the mid-1970s. As a consequence, however, the agricultural producers had to bear the burden of subsidizing consumers, as reflected in the negative MPS, which was especially severe for farmers growing rice, coconuts, and other exportable crops. It should be noted that if the market clearing price under autarky were used as the reference price during years when that price is below the world price in domestic currency, but higher than domestic price due to trade policy as suggested by Byerlee and Morris (1993), the estimated MPS during years of high world prices would have been less negative than shown in the figure.

From the early 1980s up to the end of the 1990s, the total MPS of agriculture grew rapidly, as a result primarily of the increasingly positive trend in the average nominal rate of protection which is partly a response to the resumption of the long-term declining trend of world commodity prices. Its trend turned downward as world commodity prices began to climb, with

rice having negative MPS in 2008. Nonetheless, the total market support from 1986 to 2008 was quite substantial, representing 15 percent of total value of production compared to the average NPR of 20 percent. The high total MPS in the later period more than compensated for the negative total MPS from 1960 to 1986, so that for the whole study period, the rate of MPS averaged 7 percent while NPR averaged 10 percent.

Rising border protection since the 1980s (at least until the surge in commodity prices) coincided with the growth slowdown in agriculture, but correlation does not imply causation. The relationship lies rather in political economy and history: high commodity prices in the 1970s made agriculture an opportunity for revenue extraction, hence the negative protection of the sector during that period. As explained earlier, the growing political power of farmer organizations since the late 1980s reversed the protection structure in favor of agriculture; this was not however unable to fully offset the dampening of growth owing to the commodity price slump, declining gains from productivity growth, and declining investments in public goods that underpin productivity growth (Teruel and Kuroda, 2005).

Across commodities, MPS varies widely in terms of levels and variability over time. Over the whole period, livestock and poultry appeared to have received a higher level of MPS than crops. This is mainly because of the negative MPS for rice in the 1970s up to the 1980s and the presence of exportable crops such as coconuts, bananas, pineapples, and others that have had negative or zero NPRs. As the single most important agricultural commodity, the absolute annual average values of the MPS of rice tended to be the largest across the different sub-periods. However, the relatively high level of MPS from 1985 to 2008 was just slightly more than enough to offset the negative MPS of the earlier period.

The annual average MPS for each of the agricultural commodities was clearly higher in the second half of the study period in part due to the increase in the agricultural protection and the greater real value of production, particularly the import competing commodities characterized by higher nominal protection rates. Thus far, the rapid growth of the MPS from the 1980's up to the early 2000 in the face of the continuing long-term decline in world commodity prices, have not been dissipated by the generally rising trend of world commodity prices since then; even though all the commodity-specific MPS, with the exception of poultry, declined.

Over the whole period, poultry had the highest annual average level of MPS, followed by corn, both of which consistently showed positive MPS in all sub-periods. This is mainly because of the historically high tariffs on poultry and its growing share in the total value of agricultural production, which is at present twice as high as the share of corn. Although the average NPR for sugarcane was about the same as corn over the entire study period, its annual average MPS was much lower than corn, as the relative importance of sugar in value of agricultural production decreased.

Producer support estimates

PSE for total and crop agriculture is computed in three versions:

- i) **PSE I** is MPS net of the the value of implicit tariff paid by farmers;
- ii) **PSE II** is PSE I plus transfers to farmers from irrigation service and land redistribution (Figure 2).
- iii) PSE III is PSE II computed specifically for rice, inasmuch as benefits from the NIS is received mostly by rice farmers (Figure 3).

Figure 2

Figure 3

Note that the trends of PSEI and PSEII are similar, and that the *level* of PSE III is a substantial proportion of PSEII, reflecting the dominant role of rice not just as a share of agricultural output, but more importantly in agricultural support policy. PSEI is the primary contributor to PSEII (and PSEII), largely driving the overall trends; in turn this is largely MPS, owing to the small magnitudes of the implicit tariffs. Up to the early 1980s, land redistribution and irrigation were not able to offset the largely negative MPS due to the negative nominal protection rates of importables. Subsequently PSEII and PSEII turned positive together with PSEI, approaching 40 billion (in 1985 prices) in the late 1990s.

PSEI again turned negative in 2008 owing to the sharp increase in world prices. Similar declines in producer support is observed in all countries studied in OECD (2011); in fact in 2010 producer support as a share in gross farm receipts fell to an all-time low of 18% (compared to its

peak of nearly 40% in 1986). This is is due to declining market price support component, in turn due to rising commodity prices.

Irrigation-related transfers were minimal in the 1970s, which was largely the construction or expansion phase of the major NIS. Annualized cost as well as maintenance expenses began to be reflected in the 1980s, with fairly stable transfers per year up to the present. Note that the magnitudes of the irrigation transfers are the same in Figures 2 and 3 reflecting the lopsided incidence of irrigation benefits to just one crop, rice. Meanwhile the levels of land transfers have been growing over time, reflecting the widening redistribution of land parcels over the course of PD 27 and CARP; by the end of the period, it had matched the agricultural support level of irrigation.

4. PUBLIC EXPENDITURES FOR AGRICULTURE

Agricultural policy since 1986

In pursuit of agricultural modernization, food security, and agrarian reform, a series of administrations have attempted to expand budgetary and market support for key agricultural sectors. Under the new democratic government, a more comprehensive land redistribution program was passed, mainly because left leaning groups and farmer organizations were key actors in the movement to oust the authoritarian government. Although the latter gained direct representation in the new Congress, membership was still dominated by the landed elite. Hence, CARP mandated the land compensation to be at market value, limiting its redistributive impact and raising the government cost of implementing the program.

The next surge of public expenditures for production support occurred in the mid-1990s, ostensibly to assist farmers cope with agricultural trade liberalization as the country joined the WTO. On the contrary, accession to the WTO was accompanied by rising average nominal protection rates in agriculture continued to climb until the mid-2000. In the meantime, the agriculture budget through allocations for farm to market roads, postharvest facilities, hybrid seeds, fertilizers, etc. became a convenient instrument for Congressional pork barrel funds, obtaining political patronage of local executive officials, farmer cooperatives, and other groups, and generating rents for the agriculture bureaucracy and input suppliers.

In the following we argue that the main issue for agricultural expenditure not been so much one of under-spending for the sector as a whole, but rather one of inefficiencies in budgetary allocations within the sector, together with low economic returns or the doubtful costeffectiveness of many government projects and programs. In view of past excesses, there is now an on-going re-examination of resource allocation issues as the country pursues a competitive and sustainable agricultural and fisheries sector under the Philippine Development Plan (2011-2016).

Aggregate trends

Government outlays on agriculture fluctuated widely over the past five decades. Expenditures increased dramatically between 1973 and 1983 (Figure 4). This is partly owing to the revenues from export and related taxes on major agricultural exports. Foreign loans also became more easily available as the higher petrodollar earnings due to the oil crisis were recycled in financial markets.

Figure 4

On the demand side, the high world rice prices, coupled by the introduction of modern rice varieties more suited to irrigated conditions, raised the profitability of public investments in irrigation (Hayami and Kikuchi 1978; Kikuchi, et al. 2003); similarly this boosted investments in agricultural research and development. Moreover, the concerted efforts to implement land reform in rice and corn nationwide under PD 27 required substantially greater budgetary resources than earlier programs to address agrarian problems through land reform. When rice production dropped by 20 percent in 1973/74 as landowners ceased lending to former tenants, the government embarked on the massive *Masagana* 99 Program that provided low-cost credit and subsidized inputs to rice farmers, reflected in the sharp increase in GA from the mid-70s onward.

In the early 1980's, agriculture bore the brunt of the fiscal contraction, but public expenditures for the sector recovered in the late 1980's. After reaching another peak in 1991, as the CARP got underway, public spending leveled off, followed in the mid-1990s by another cycle of sharply rising and declining trends after 2000. That second peak level of public support was ten percent higher than the peak in 1980. The higher spending may be explained by the safety nets adopted to ease the burden of adjustment on farmers following the ratification of the Uruguay Round and the increased government support mandated by the AFMA.

Public expenditures for agriculture declined from 2000-2006, consistent with the fiscal constraints of this period owing to the failure of tax effort to recover to its healthier levels prior

to the Asian financial crisis. However, it managed to re-ascend to levels slightly higher than the previous peaks. Nevertheless, public expenditures in recent years still do not match the budgetary priority accorded to agriculture during the 1970s up to the early 1980s.

Composition of public expenditure for agriculture

Figure 5 displays the composition of public expenditures for agriculture in real terms by policy instrument, namely: i) outlays for irrigation; ii) outlays for land reform; iii) RDER; iv) all production support; v) other support. Note that items iii), iv), and v) sum up to GSSE. Up to the end of the 1960s, RDER formed the core functions of agricultural governance, accounting for 50 to 65 percent of total public expenditure for the sector.

Figure 5

This was a far higher share than the average for irrigation (21%), land redistribution (6%), and overall production support (10%) during this decade. The sharp increase in public expenditures in the 1970s and early 1980s was due mainly to irrigation investments. At its peak in 1980-81, irrigation expenditure accounted for about 60 percent agricultural spending and 20 percent of total infrastructure budget. Since then, government spending for irrigation fell dramatically, as did total agriculture expenditures. Gains from irrigation investment subsequently dropped, as world commodity prices resumed its long-term declining trend, the cost of further expansion of irrigation increased, and budgetary resources of the government became severely constrained.

Following the issuance of PD 27 in 1972, which mandated the transfer of ownership of rice and corn lands to tenant-farmers, public expenditures for land redistribution increased, accompanied with credit and technical support from the Masagana 99 program. The share of overall production support from 1960 to the mid-1980s fluctuated from a low of 2 percent in the early 1980s, to nearly 30 percent of total agricultural spending at the height of the Masagana 99 program in 1974.

With the passage of CARP in 1987, greater budgetary outlays for land redistribution, accompanied by increased expenditures for support services for farmer beneficiaries as represented by the share of OPS, led the recovery in public expenditures in agriculture in the late 1980s. Government spending for irrigation continued to be the single biggest item of public expenditures for the sector, but it has comprised a relatively smaller share of about 20-25 percent

since the 1990s. The share of RDER, which decreased substantially to just slightly above 20 percent by 1980, rose briefly to 40 percent in the mid-1980s, but averaged only 25 percent since the 1990s.

Whereas the share of spending for land redistribution averaged 10 percent during the implementation of PD 27, and even less (about 5 percent) prior to 1972, its average share more than doubled to slightly more than 20 percent since the passage of CARP in 1987. The combined share of various production support services also increased sharply to an average of 25 percent and reaching 40 percent by 2008.

Details regarding the changing pattern of expenditures and policy instrument performance are taken up in Annexes 3 (irrigation), 4 (land reform), 5 (General services support, covering RDER and all production support). The general message is that main problem affecting agriculture is not *underspending* for the sector as a whole, despite the policy importance attached to overall public agricultural expenditure under AFMA. Rather, the main problem is one of inefficiency in budgetary allocations within the sector accompanied by low economic returns or the doubtful cost-effectiveness of many government projects and programs.

Budgetary outlays for private goods, mainly in the category of "all production support", crowd out the use of government resources (budgets, personnel, institutions) for public goods that have high social rates of returns. A prominent example is research: estimates of the social rates of return on agricultural research worldwide report a median rate of about 42 percent with an mean of 65 percent albeit with wide dispersion (Alston, et al 2000). In India and China, Fan, Hazell, and Thorat (2000) found unusually high returns for public investments in market infrastructure, research and development, and education. Survey of studies measuring returns to investments in education in many countries also indicate very high rates of returns (Psacharopoulos 1994, Psacharopoulos and Patrinos 2004).

Diverting scarce budgetary resources to provision of private goods may also have significant negative social equity implications, as wealthier individuals including larger producers, input suppliers, politicians and other decision makers typically capture most of the benefits from such expenditures. On the other hand, permissive policies with respect to fiscal management typically lead to unstable funding of rural programs. Lopez and Galinato (2007) have found that, in Latin America, reducing the share of subsidies to public goods in the government budget has a significant and large positive impact on per capita incomes in rural

areas and contributes to poverty reduction. Similarly a re-allocation in is warranted in the case of the public expenditures in the Philippines.

Note, however, that re-allocation does not address quality issues in asset provision and service delivery. Deep-seated institutional constraints are undermining cost-effectiveness (Habito et al, 2010). Centralized decision-making, vulnerability to political pressure, and widespread corruption suggest that government spending on agriculture is especially wasteful in the Philippines.⁵ Annex 3 provides an exhaustive discussion on service provision problems in the case of irrigation. in In the case of RDE, Gapasin (2006) notes the following gaps: *the need to shift to demand-driven and market-oriented RDE; the highly complex, disperse, and duplicating institutional arrangements and weak research-extension linkage... and the large human capital that needs to be reoriented to fit the shift towards market-oriented and demand-driven RDE* (p. 12).

5. SYNTHESIS

Comparison of PSE, GA, and GSSE

Figure 6 compares the trends in MPS, PSE I, and GA (note that MPS is almost identical to PSE I). PSE I varies much more widely than GA; from 1960-1985, PSE I was mostly negative, GA served to offset, in part, the the taxation of agriculture (and crops) through price intervention policies. As these policies switched from taxing to subsidizing agricultural output prices, and implicit tariff on fertilizer declined after the mid-1980s, the ratio of PSE I to GSSE rose to 170 percent for agriculture. Only in the most recent years, when commodity prices increased worldwide, did PSE I drop to levels below that of GA; in some sense the expansion of GA, mainly in the form of production support (Section 4), is largely an attempt to achieve self-sufficiency in the face of rising import cost. This state of affairs may be temporary; World Bank (2011) expects its world agricultural price index to decline, albeit very gradually, falling by about one-fifth over the decade from its peak level in 2011.⁶

Figure 6

Table 6 presents together the estimate of producer support for agriculture (PSE II) and for rice (PSE III), with GSSE for agriculture as a whole. Note that PSE II and PSE III include the contribution of the annual cost of irrigation service from the NIS and the resource transfer due to

land redistribution, whereas GSSE excludes public expenditures for irrigation as well as land acquisiton and distribution. As PSE II grew up to the 1990s (mostly absorbed by rice producers), GSSE rose even more rapidly; the ratio between producer support and general services support was 4.67:1 in the 1970s, falling to 3.86:1 in the 2000s. The greater contribution of price intervention policies in transferring resources from consumers and taxpayers to agricultural producers since the mid-1980s is consistent with the findings in OECD countries, as well as in a few other developing countries such as Brazil in recent years.

Table 6

Overall GSSE in the protection period (1986 - 2008) was nearly triple that of the 1970s. GSSE was deflected somwhat in the fiscal contraction in the 2000s, but remains a steadier source of support than price intervention, owing to rapid increases in world prices.

Implications

Alternative configurations may be proposed for agricultural support in pursuit of the key policy goals for agricultural development. The first set of recommendations deals with price distortions, while the second set deals with public expenditures.

With respect to incentive distortions, quantitative trade restrictions for all agricultural commodities must be removed to facilitate the narrowing of dispersion of nominal protection rates by through tariff reductions and generate revenues for the government. Assisting farmers cope with the cost of structural adjustments with the inevitable decline in the share of agriculture in the total economy can be more efficiently accomplished by public expenditures for agriculture-specific public goods to strengthen the agriculture sector's competitive advantage, and by public investments in education, health, and market infrastructure to help the younger rural population move to non-agricultural employment.

In particular, for rice the adoption of a tariff regime and reliance on the private sector to undertake all domestic and international market operations would be a landmark advance in agricultural policy. Tariffication avoids the high cost of NFA operations and sidestep governance problems associated with quota allocation, while maintaining some measure of price protection. Rather than appropriating funds for the NFA, government can apply tariff revenues towards productivity-enhancing public investments in the agricultural sector and better targeted subsidies (cash transfers) for rice consumption of poor households. With the same level of budgetary appropriations and corporate borrowing, transfers to poor consumers can be tripled and still increase public expenditures for agriculture by 15 percent, simply by shifting to tariffs and cash transfers for consumers.

One frequent objection to tarrification is the transmission of volatile world prices onto domestic prices, which becomes onerous during price surges. Variable tariffs may address this to a limited extent (the NFA was in fact provided a statutory exemption from tariffs in 2008). However, as shown by Martin and Anderson (2011), unilateral actions by countries to insulate domestic prices from world price swings collectively aggravates volatility; a better alternative is to negotiate international agreements to limit resort to such policies.

With respect to public expenditures, a critical reform would be to limit expenditures for production support to those that address market failures—lack of access to formal financial markets by small producers, non-viability of crop insurance coupled by the substantial yield instabilities caused by weather disturbances and pest infestations, and so forth. Specifically, subsidies for postharvest facilities and equipment, farm machineries, hybrid seeds, fertilizers, agricultural chemicals, animal distribution which are all private goods must be discontinued. Quasi-financial institutions such as QUEDANCOR should be abolished and government support for rural credit coursed through banking institutions. Budgetary allocations for market infrastructure must be appropriated through the DPWH and LGUs directly for better planning and accountability, and so as not to bloat agriculture budget and crowd out expenditures for RDER. In other words, congressional insertions in the budget of the DA must not be allowed and neither should spending for agricultural inputs be included in the PDAF (the *de facto* "pork barrel" of members of Congress). Even for the remaining irrigation and production support budget, political considerations in the distribution of the agricultural budget must be minimized.

Rationalization of production support should be accompanied by dramatic escalation of agriculture expenditures for R&D, extension support, and regulatory services. However, the increase must be accompanied by institutional changes to improve efficiency and effectiveness. Organizational restructuring for more efficient operations and clearer accountability may be called for. Budget increases must be sustained, and structured so that releases are reliable and timely. The proportion of core budget of research agencies, offices, or units allocated for personnel must not exceed 50 percent so that sufficient resources for operations and maintenance and capital outlay are available for conducting research. At present, efficiency and effectiveness

of these programs are hampered by low budget, fragmented institutional and budgetary structure, and being too top-down with respect to dealing with LGUs and farmers.

With respect to major spending items: in the case of irrigation, the appropriate directions for policy reform have been well articulated w by other analysts, including the critical need for greater farmer participation in operation and maintenance of NIS, more systematic planning, assistance, monitoring, and evaluation of public support to CIS, higher budgets for R&D in water management, stronger regulatory framework for water resource development, and so forth. Not the least, political interference in the allocation of irrigation budgets, in the choice of contractors in project implementation, and in personnel assignments to extract rents hinders the efficient performance of the irrigation agency.

In the case of land redistribution, the current land reform phase should be unequivocally terminated under this final extension. Regulations against share-tenancy and land sale abolished to minimize distortions in land market operations. Efforts must be concentrated in the redistribution of lands under compulsory arrangements, the conversion of group CLOAs to individual CLOAs, and completing payments to landowners. Resources should be allocated to accelerate the computerization of the land registry records and make progressive land taxation feasible. A detailed workplan and schedule of staff reductions towards completion of the land redistribution program at DAR and Land Bank must be developed and implemented.

¹ As pointed out by a reviewer, the RRP is an attempt to quantify the protection of agriculture compared to protection of non-agriculture; if the latter is further qualified as "nontrable", the protection of agriculture incorporates real exchange rate effects. Non-tradable nonagriculture still accounts for a large part of the economy (services, which are mostly nontradable, accounts for half of GDP and more than half of employment). Appreciation of the real exchange rate, whether by nominal appreciation (as has happened recently in the Philippines), or by inflation (fairly modest in the Philippines), raises the relative price and profitability of nontradables. If seen as medium term trend, this could affect investment decisions. The distortionary sources of real exchange rate trends remains controversial, as the country has officially adopted a floating exchange rate under (low) inflation targeting. Real exchange rate changes are an important determinent of inward or outward orientation of the economy and are

critical to the overall development strategy; however in this paper we opt to focus on more sector-specific distortions.

² In the case of fertilizers during the late 1970s and early 1980s, subsidies for fertilizers effectively supported the inefficient domestic fertilizer industry (David and Balisacan 1982). Annual and special audit reports of the Commission on Audit repeatedly indicate that most of the agricultural inputs distributed to farmers were significantly overpriced. In fact, many of these, including liquid fertilizers, mechanical grain dryers, and others hardly benefitted the farmers. Some subsidies, such as for certified rice seeds, multipurpose pavements for drying palay, and others have been beneficial, but domestic support for these agricultural inputs are relatively small.

³ News reports are candid about the *de facto* regime of quantitative restrictions. A few examples:

Five companies submitted offers totalling 33,400 tons of sugar imports at a state auction on Tuesday, below the 45,100 tons volume the Philippines was seeking, government officials said. But Manila may award only 22,400 tons of sugar from the auction due to restrictions related to the end-users of the imports, one official said, adding the government may hold another tender at a later date for the remaining volume it failed to fill. http://www.abs-cbnnews.com/business/04/20/10/5-firms-join-bidding-philippine-sugar-import-rights.

Philippine feed millers are seeking government approval for imports of 100,000 tons of yellow corn between January and March to support the requirements of the livestock industry after typhoons damaged local crops, official documents showed. The Philippine Association of Feed Millers Inc (PAFMI) said in an Oct. 26 letter to Agriculture Secretary Proceso Alcala, a copy of which was obtained by reporters, that two strong typhoons in late September and early October had damaged the quality of corn crops, pushing up local prices. http://www.abs-cbnnews.com/business/10/31/11/ph-feed-millers-seeking-100000t-corn-imports

The Department of Agriculture may issue permits to import white onions for a limited period to address a shortage in the local supply of white onions for salads and sandwiches. In a radio interview yesterday morning, Agriculture Secretary Proceso J. Alcala acknowledged shortness of supply but added that the DA has not yet issued any permits. Alcala said that following a consultation with onion industry stakeholders, it was revealed that there is adequate supply of red onions, but there is a low stock of white onion. As such, Alcala said the DA is studying the possibility of issuing a limited permit to import white onions with the arrival of the onions to be timed just up to October and not during the expected harvest. Local onion growers however, are against the planned importation, stressing that there is still plenty of supply. They are holding Alcala to his promise to them not to issue import permits to protect the industry and encourage production. However, Alcala also sees the need of some food establishments for white onions for use in salads and sandwiches. http://www.philstar.com/Article.aspx?articleId=731888&publicationSubCategoryId=66.

⁴ Average MPS rate is the divergence of production value at domestic and border price as ratio to production value at domestic prices. Average NPR rate is divergence of production value at domestic and border price as ratio to production value at border prices. The denominator in the computation of NPR (value of production at undistorted prices) is lower than the denominator in the computation of MPS rate when commodity specific NPRs are positive, and vice verss when the latter is negative.

⁵ The Philippines places 134th out of 178 countries in the 2010 Corruption Perceptions Index (www.transparency.org).

⁶ <u>http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1304428586133/Price_Forecast.pdf</u>

	1960-70	1970-80	1980-90	1990-00	2000-08
Total crops	3.8	6.3	1.6	1.3	3.2
Palay	4.5	4.7	2.7	2.3	3.8
Corn	5.3	5.9	3.5	-0.9	6.4
Coconut	2.3	4.9	-4.9	-0.6	2.0
Sugar	4.8	2.9	-5.3	0.5	3.6
Banana	5.5	15.6	-3.0	4.4	7.1
Other crops	3.6	9.5	1.1	1.2	1.5
Livestock &					
poultry	3.2	3.0	4.7	4.9	2.2
Livestock	3.1	0.5	4.9	4.4	1.9
Poultry	3.7	9.2	4.4	5.6	2.5

Table 1: Annual growth rates of gross value added (at 1985 prices) of agriculture by commodity (percent).

Source of basic data: National Statistics and Coordination Board

	1960	1970	1980	1990	2000	2007
RCA						
All agriculture ^b	3.0	2.6	2.9	1.6	0.6	1.0
0	11(0	145.0	224.0	212.0	71 4	07.1
Coconut	116.0	145.0	224.0	212.0	/1.4	97.1
Sugar ^c	17.6	21.4	12.1	3.8	0.9	1.3
~ "8					•••	
Banana	-	4.1	29.5	23.1	10.6	32.8
Pineapple						
Canned	32.1	47.5	83.2	69.5	27.7	39.7
Fresh	-	2.8	45.2	56.2	9.4	26.5
SSR						
Rice	0.95	1.00	1.03	0.94	0.95	0.93
Com	1.00	1.00	0.02	0.02	0.01	1.00
COIII	1.00	1.00	0.95	0.95	0.91	1.00
Sugar	1.07	1.05	1.06	1.01	1.00	1.01

Table 2: Revealed comparative advantage (RCA) and self-sufficiency ratios (SSR) of majoragricultural commodities, 1960-2007

^aEstimated as the ratio of the share of a commodity group in a country's exports to that commodity group's share of world exports.

^bIncludes fisheries.

^cNote that sugar has been historically exported to the US typically at a premium 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.

^dSelf-sufficiency ratio is computed as the ratio of production to production, plus imports, minus exports.

Note: Except for 1960 and 2007, all are 3-year averages centered at year shown. Source of basic data: FAOSTAT

	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04	2005-08
Import-competing products ^a										
Rice	6	-1	-10	-18	-16	14	21	53	51	5
Corn	19	38	14	24	20	60	63	79	55	32
Sugar	18	121	-12	2	60	13	49	97	79	49
Beef	15	15	12	10	5	17	28	28	10	10
Pork	-30	14	3	-6	36	51	25	21	-8	-10
Chicken	35	67	29	28	38	43	57	42	52	46
Exportables										
Coconut	1	-9	-14	-4	-16	-9	-3	6	-1	-7
Bananas	-	-	-4	-4	-4	-1	-	-	-	-
All covered products ^a	-2	15	-6	-8	-5	16	18	38	25	
Dispersion, covered products ^b	17	30	25	22	29	30	28	28	30	

Table 3: Five-year average nominal protection rates by commodity, 1960 – 2008, in percent

a/ Weighted averages; the weights are based on the unassisted value of production.

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

Indicator	1962-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-04
All agricultural products	-1.6	13.3	-5.6	-6.6	-3.6	14.4	15.4	33	26
Trade bias index ^a	-0.03	-0.18	0.04	-0.03	-0.15	-0.31	-0.26	-0.34	-0.31
NPR, agricultural tradables NPR, non-agricultural tradables	-1.7 19	14.3 20.3	-6 16.3	-7.2 16.3	-4 12.9	15.8 11	16.7 9.9	35.7 8.6	27.9 7.3
RRA ^b	-17.4	-5	-19.8	-20.3	-14.9	4.3	6.1	24.9	19.1

Table 4: Nominal rates of protection in agricultural relative to nonagricultural industries, 1960-2004 (percent)

a/ TBI = ((1+NPRagx)/(1+NPRagm))-1 b/ RRP= ((1+NPRag)/(1+NPRnonag))-1

	1960-08	1960-85	1986-08	1960-69	1970-79	1980-89	1990-99	2000-08
MPS								
Agriculture	8,433	-2,726	21,047	3,697	-11,725	8,506	27,514	13,328
Crops	3,979	-4,884	13,998	2,432	-12,654	1,614	17,653	10,452
Rice	2	-4,354	4,926	-760	-7,883	-2,537	6,451	4,740
Corn	2,312	1,140	3,636	836	1,135	2,737	4,123	2,496
Coconut	-976	-1,642	-223	-599	-1,321	-2,579	143	-427
Sugarcane	1,264	239	2,423	2,597	-3,125	2,225	2,565	1,932
Other crops	1,377	-267	3,236	358	-1,460	1,767	4,372	1,712
Livestock & poultry	4,454	2,158	7,049	1,265	930	6,892	9,861	2,876
Cattle	403	273	550	324	308	258	795	288
Hogs	998	650	1,392	38	-271	3,972	3,817	-2,664
Poultry	3,053	1,235	5,107	903	893	2,663	5,249	5,251
MPS rate								
Agriculture	7	-3	15	6	-9	7	20	11
Crops	4	-6	15	4	-12	2	18	13
Livestock & poultry	16	14	17	12	6	27	24	7

Table 5: Annual average MPS of agriculture (P Mn in 1985 prices) and nominal protectionrate (in percent) by commodity at various time periods, 1960-2008.

Table 6: Producer support (PSE II and PSE III) and General Services Support estimates,1970 – 2008, in P Mn at 1985 prices

	1970-79	1980-89	1990-99	2000-08	1986-08
PSE II	10,853	13,109	35,829	22,657	29,870
PSE III	11,783	6,216	25,968	19,781	22,821
GSSE	2,324	3,433	9,139	8,534	6,761



Figure 1: Trends in market support of major agricultural commodities, 1960-2008 (P Bn in 1985 prices)














Figure 5: Public expenditure on agriculture by policy instrument, 1960-2008



Figure 6: Comparison of MPS, PSE I and public expenditure for agriculture (G), 1960-2008

Fig. 29a. Comparison of the market price support, PSE I (MPS net net implicit tax on fertilizer) and the public expenditure (or G) for agriculture, 1960-2008 (PBn in 1985 prices).

References (including citations in the Annex)

AGILE (2000). "Financial Options for Restructuring the National Food Authority", unpublished paper.

- Akiyama, T. and K. Kajisa (2004), "Effects of Direct Protection for Agriculture in Three Southeast Asian Countries", in T. Akiyama and D.F. Larson, *Rural Development and Agricultural Growth in Indonesia, the Philippines, and Thailand*, Washington DC: World Bank.
- Aldaba, R.M. (2005a), "Policy Reversals, Lobby Groups and Economic Distortions", Discussion Paper Series No. 2005-04, Philippine Institute of Development Studies, Makati City.
- Aldaba, R.M. (2005b), "The Impact of Market Reforms on Competition, Structure and Performance of the Philippine Economy", Discussion Paper Series No. 2005-24, Philippine Institute of Development Studies, Makati City.
- Alston, J. M. (1986), "An Analysis of Growth of U.S. Farmland" American Journal of Agricultural Economics, Vol. 86, No. 1. Pp1-18.
- Alston, J. M., C. Chan-Kang, M. C. Marra, P. G. Pardey, and T. J. Wyatt (2000), Research Returns Redux: A Meta-Analysis Of Rates of Returns to Agricultural R&D. Australian Journal of Agricultural and Resource Economics 44(2):185-215.
- Anderson, K. and Y. Hayami with associates (1986), The Political Economy of Agricultural Protection: East Asia in International Perspective, London and Sydney: Allen and Unwin.
- Anderson, K. and W. Martin (2009), "Introduction and Summary", in K. Anderson and W. Martin Distortions to Agricultural Incentives in Asia, World Bank.
- Araral, E. K. (2006), Decentralization Puzzles: A Political Economy Analysis of Irrigation Reform in the Philippines, Unpublished Phd thesis, Indiana University.
- Balisacan, Arsenio M. (1990). Fertilizers and Fertilizer Policies in Philippine Agricultural Development.
- Balisacan A.M., N. Fuwa and M.H. Debuque (2004), "The Political Economy Of Philippine Rural Development since the 1960s", in T. Akiyama and D.F. Larson, Rural Development and Agricultural Growth in Indonesia, the Philippines, and Thailand, Washington DC: World Bank.
- Ballesteros, M. and C.C. David (2010) The cost of redistributive land reform in the Philippines: Assessment of PD 27 and RA 6657. DP 2010-09. PIDS, Makati.
- Bautista, R.M. (1987), Production Incentives in Philippine Agriculture: Effect of Trade and Exchange Rate Policies, Research Report No. 59, Washington DC: International Food Policy Research Institute .
- Bautista, R. and G. Tecson (2003), "International Dimensions", in The Philippine Economy: Development, Policies, and Challenges, ed. A. M. Balisacan and H. Hill, New York: Oxford University Press.
- Borras,, S. (2004), Rethinking Redistributive Land Reform : Struggles for Land and Power in the The Hague : Institute of Social Studies : Maastricht : Shaker Publishers.
- Borrel, B., D. Quirke, B. de la Pena and L. Noveno (1994), Philippine Sugar: An Industry Finding Its Feet, Canberra, Australia: Center for International Economics.
- Bouis, H. (1982), Rice Policy in the Philippines, Unpublished Phd dissertation, Stanford University.

- Briones, R. (2011). Trade agreements, food security, and the Philippines: from import substitution industrialization to import substituting agriculture. Presented at the Asia Pacific Policy Forum on Regional Trade Agreements and Food Security, Beijing, 25-26 October.
- Byerlee, D. and M. L. Morris (1993). "Calculating Levels of Protection: Is It Always Appropriate to Use World Reference Prices Based on Current Status?" World Development, Vol.21, No.5, pp. 805-815.
- Clarete, R.L. (1991), E.O. 470: the Economic Effects of the 1991 Tariff Policy Reforms, Report prepared for the USAID, Washington, DC: USAID.
- Clarete, R.L. and J.A. Roumasset (1990), "The Relative Welfare Cost of Industrial and Agricultural Policy Distortions: a Philippine Illustration", Oxford Economic Papers 42(2).
- Clarete, Ramon L. (2008). "Options for National Food Authority", in S. Rashid. A. Gulati. And R. Cummings Jr. (eds.), From Parastatals to Private Trade: Lessons from Asian Agriculture, Oxford University Press.
- Commission on Audit (2003). "Philippine Crop Insurance Corporation", Report No. 2003-01, Performance Audit, Management Services.

(2005). "Procurement System: Department of Agriculture", Report No.2005-08B, Government-Wide Performance Audit, Management Services.

(2006), "Utilization of the Forfeited Swiss Deposits for the Implementation of the Comprehesive Agrarian Reform Program (CARP)", Report No.2006-01, Sectoral Performance Audit, Management Services.

(2008), "GMA Rice Program", Report No. 2008-, Sectoral Performance Audit, Management Services.

(1998 to 2007). Annual Audit Reports of all agriculture-related departments, agencies, and GOCCs, National, Corporate, and Local Government Audit offices.

(2005). "Audit of the P728 million GMA Farm Input Fund", National Government Audit (Cluster VI)

- Cororaton, C., E. Corong, and J. Cockburn (2010), "Philippines", in K. Anderson, J. Cockburn, and W. Martin, Agricultural Price Distortions, Inequality, and Poverty, eds. Washington: The World Bank.
- David, Cristina C. (1979) "Structure and Performance of Rural Financial Markets in the Philippines", Economics and Sociology Occasional Paper No. 589, Agricultural Finance Program, DAERS, Ohio State University.
- David, C. C. and A. M. Balisacan (1982) "An Analysis of Fertilizer Policies in the Philippines", Journal of Philippine Development, Vol. 8 (Nos 1 and 2).
- David, Cristina C. (1983). "Economic Policies and Philippine Agriculture", Philippine Institute of Development Studies: Makati City.
- David, C.C. and J.K. Huang (1993), "Political Economy of Rice Price Protection in Asia", Economic Development and Cultural Change, Vol. 44.
- David 1996
- David, Cristina C., E.R. Ponce, S.C. Halos, and C.B. Lamug (1999), "Philippine National Agricultural and Natural Resources Research System: Resource Allocation: Issues and Directions for Reform", Discussion Paper No. 99-33, Philippine Institute of Development Studies: Makati City.

- David, Cristina C. and Arlene B. Inocencio (2000). "Key Indicators for Public Expenditure in Agriculture, Natural Resources and the Environment", PIDS Discussion Paper No. 2000-26.
- David, C. et al (1998), "Philippine National Agricultural and National Agricultural and Natural Resources Research System: Resource Allocation Issues Directions for Reforms," PIDS Discussion Paper No. 99-33, Manila:Philippines.
- David, Cristina C. (2003). "Agriculture", in A.M. Balisacan and H. Hill (eds), The Philippine Economy: Development, Policies, and Challenges, New York: Oxford University Press.
 - (2006). "The Philippine Hybrid Rice Program: A Case for Redesign and Scaling Down", Research Paper Series, No. 2006-03, Philippine Institue of Development Studies, Makati City.
- David, Cristina C., P.S. Intal, and A.M. Balisacan (2009). "The Philippines", in K. Anderson and Martin, W. (ed.), Distortions to Agricultural Incentives in Asia, The World Bank, Washington, D. C.
- David, Cristina C and A. B. Inocencio (2010). "Irrigation Policy and Performance Indicators in the Philippines"
- David, Wilfredo P. (2003). Averting the Water Crisis in Agriculture: Policy and Program Framework for Irrigation Development in the Philippines, The University of the Philippines Press and Asia Pacific Policy Center.

(2004). "Water Resources and Irrigation Policy Issues in Asia" Asian Journal of Agriculture and Development, Vol 1, No. 1, pp 83-106.

- Department of Agrarian Reform (1998), "The Agrarian Situation in Coconut Lands", Policy and Planning Office, Quezon City.
- Department of Agrarian Reform (1995), "An Assessment of the Operationalization of Leasehold System in Selected Tenanted Coconut Lands, Policy and Planning Office, Quezon City.
- Esguerra, E.F. (1981). "An Assessment of the Masagana 99 Credit Subsidy as an Equity Measure", Philippine Review of Economics and Statistics", Philippine Review of Economics and Business, Vol 18.
- Esguerra, Emmanuel P. (1995). "Rural Credit Programs in the Philippines: Lessons and Policy Issues"
- Fan, S., P. Hazell, and Thorat (2000), "Government Spending, Growth, and Poverty in Rural India", American Journal of Agricultural Economics, Vol. 82 (4), pp.1038-1051.
- Ferguson, C. (1987), Returns to Irrigation Intensification in Philippine Gravity Systems, Unpublished Phd thesis, Cornell University.
- Gapasin, D., 2006. Agricultural Research, Development, and Extension. Philippines: Rural Growth and Development. Report No. 36884. East Asia and Pacific Region, World Bank: Washington D.C.
- Geron, P.S. and M.S. Casuga (2010), "Credit Subsidy in Philippine Agriculture"
- Gulati, A. and S. Narayanan (200), Subsidy Syndrome in Indian Agriculture, Oxford University Press, New Delhi.
- Gulati, A., R. Meinzen-Dick, and K. Raju (2005). Institutional Reforms in Indian Irrigation. Sage Publications, London.
- Habito, C. F., Clarete R., Pena, B. D. L, Israel, D., & Ponce, E., 2010. Final comprehensive report Technical assistance for the formulation of the successor agriculture and fisheries modernization plan. Report submitted to the World Bank.
- Hayami, Y. and M. Kikuchi (1978), "Investment Inducements to Public Infrastructure: Irrigation in the Philippines", The Review of Economics and Statistics, Vol. 6.

Hayami, Y., A. Quisumbing, and L. Adriano (1990), Toward an Alternative Land Reform Program,

Ateneo de Manila University Press.

- Hayami, J. and M. Kikuchi (2000), A Rice Village: Three Decades of Green Revolution in the Philippines, MacMillan Press (Great Britain), Barnes and Noble (U.S.A.), in association with International Rice Research Institute (Philippines).
- Institute od Agriculture and Urban Development Studies (2008), An Assessment of the Comprehensive Agrarian Reform Program and its Impact on Rural Communities: Household (Micro) Perspective, UPLB: IARDS, February.
- Intal, P. S. and J.H. Power (1991). "The Philippines", in A. O. Krueger, M. Schiff, and A. Valdes (eds.), The Political Economy of Agricultural Pricing Policy, Vol. 2: Asia, Baltimore and London: Johns Hopkins University Press.
- Intal, P. S., L.F. Cu, and J.A. Illescas, (2009), "Rice Prices and the Naional Food Authority"
- Jatileksono, T. and K. Otsuka (1993), "Impact of Modern Rice Technology on Land Prices: The Case of Lampung in Indonesia", American Journal of Agricultural Economics, Vol. 75, No. 3, PP. 652-665.
- Josling, T.E. and A. Valdes (2004), "Agricultural Policy Indicators", ESA Working Paper No. 04-04, The Food and Agriculture Organization of the United Nation.
- Kikuchi, M., A. Maruyama and Y. Hayami (2003), "Phases of Irrigation Development in Asian Tropics: A Case Study of the Philippines and Sri Lanka", The Journal of Development Studies, Vol. 39(5), pp109-138.
- Llanto, Gilbert (2007), "Infrastructure and Regional Growth", in A.M. Balisacan and H. Hill ed, The Dynamics of Regional Development: The Philippines in East Asia, Ateneo de Manila University Press.
- Llanto, Gilberto M., P.S. Geron, and C.G. Tang (1999). Directed Credit Programs: Issues and Framework for Reform, Credit Policy Improvement Program, National Credit Council, Department of Finance.
- Lopez R. and G. Galinato (2007), "Should Governments Stop Subsidies to Private Goods? Evidence From Rural Latin America", Journal of Public Economics, Vol. 91, pp. 1071-94.
- Malik, Ravinder P.S. (2008). "Towards a Common Methodology for Measuring Irrigation Subsidies". Discussion Paper, Global Subsidies Initiative, International Institute for Sustainable Development.
- Manasan, R.G. and V.S Pineda (1999), "Assessment of Philippine Tariff Reform: A 1998 Update", Unpublished paper funded by the USAID.
- Melichar, E. (1979), "Capital Gains Versus Current Incomein the Farming Sector", American Journal of Agricultural Economics, Vol 61(5). Pp. 1985-1092.
- Moya, Piedad (1981) " A Comparative Economic Analysis of Different Types of Irrigation Systems in Central Luzon, Philippines, in T. Wickham (ed) Irrigation Management: Research from Southeast Asia, Agricultural Development Council, Inc
- Moya, Piedad (1984) " Farm Level Benefit of irrigation in the Libmanan- Cabusao Irrigation System, Paper presented at the Workshop to Review Selected Research to Increase Rice Production in the Bicol River Basin Area, Camarines Sur, June 1984.
- Mullen, K., D. Orden, and A. Gulati (2005), "Agricultural Policies in India: Producer Support Estimates 1985-2002", MTID Discussion Paper No. 82, International Food Policy Research Institute.

- OECD(2011). Agricultural Policy Monitoring and Evaluation 2011: OECD Countries and Emerging Economies. OECD Publishing http://dx.doi.org/10.17871/agr pol-2011-en.
- OECD (2008), OECD's Producer Support Estimate and Related Indicators of Agricultural Support: Concepts, Calculations, Interpretation and Use (The PSE Manual), Trade and Agriculture Directorate.
- Oorthiezon, Joost (2003), Water, Works, and Wages: The Everyday Politics of Irrigation Managemant Reform in the Philippines, Orient Longman: Hyderabad.
- Otsuka, K. (1991), " Determinants and Consequences of Land Reform Implementation in the Philippines", Journal of Development Economics, Vol. 35, No. 1, pp339-355.
- Pardey, P. G., N. Beintema, S. Dehmer, and S. Wood (2006), Agricultural Research: A Growing Global Divide, Food Policy Report, International Food Policy Research Institute and Agricultural Science and Technology Indicators.
- Pasadilla, G.O. (2006), "Preferential Trading Agreements and Agricultural Liberalization" unpublished paper, Philippine Institute of Development Studies.
- Pascual-Gapasin, Dely (2006), "Agricultural Growth and Development", in Rural Growth and Development Revisited, World Bank.
- Philippines (Rep). General Auditing Office (Commission on Audit), 1955-1978, Report of the Auditor General to the President and the Congress of the Philippines on Local Governments and Provincial Hospitals, Fiscal Year ended _____.
- Pimentel, A. (2006), "A Study on the Impact of the Philippine Tariff Reform Program; An Input-Output Model, Unpublished paper, Southeast Asia Research Center for Agriculture, Los Banos, Philippines.
- Plusquellec, H. (2002). How Design, Management, and Policy Affect the Performance of Irrigation Projects: Emerging Modernization Procedures and Design Standards, Food And Agriculture Organization.
- Power, J.H. (1971), "The Structure of Protection in the Philippines", in Balassa and Associates, The Structure of Protection in Developing Countries, Johns Hopkins University, Baltimore.
- Psacharopoulos, G. (1994), "Returns to Investment in Education: A Global Update", World Development, Vol. 22 (9).
- Psacharopoulos, G. and H. A. Patrinos (2004), "Returns to Investment in Education: A Further Update", Education Economics, Vol. 12(2), pp.111-134.
- Robison, L.J., D.A. Lins, and R. Ventakaraman (1985), "Cash Rents and Land Values in U.S. Agriculture", American Journal of Agricultural Economics, Vol. 67, No. 4, pp. 794-804.
- Roumasset, James (2000). "Black-Hole Security" Working Paper No. 00-5, in Market Friendly Food Security : Alternatives for Restructuring NFA.
- Shalit, H. and A. Schmitz (1982), "Farmland Accumulation and Prices", American Journal of Agricultural Economics, Vol. 64, pp.710-719.
- Shepley, S. C., E. M. Buenaventura, D.C. Roco (2000), Review of Cost Recovery Mechanisms for National Irrigation Systems, Final Report TA 3235-PHI, National Irrigation Administration and Asian Development Bank
- Sison, Jerome F. and R. A. Guino (1984) "An Assessment of Cost and Performance of various Types of Irrigation Systems in the Philippines", Final Report submitted to the ADB for the Project Assessment of Food Demand and Supply Prospects and related Strategies for development Member Countries of the ADB, Manila, Philippines.
- Slayton, Tom (2009), "Rice Crisis Forensics: How Asian Governments Carelessly Set the World Rice Markets on Fire," Center for Global Development, Working Paper No.163.

- Small, Leslie L., M.S. Adriano, E.D. Martin, R. Bhatia, Y.K. Shim. And P. Pradhan () "Financing Irrigation Services in the Philippines" in Financing Irrigation Services: A Literature Review and Selected Case Studies from Asia, International Irrigation Management Services.
- Stads, Gert-Jan, P. S. Faylon, and L. J. Buendia (2007). "Agricultural R&D in the Philippines: Policy, Investments, and Institutional Profile", ASTI Country Report, International Food Policy Research Institute and Philippine Council for Agriculture, Forestry and Natural Resources Research and Development
- Swanson, B, B. J. Farmer, and R. Bahal (1990), "The Current Status of Agricultural Extension Worldwide" in Food and Agriculture Organization
- Tan, E.S. (1994), "Trade Policy Reforms in the 1990s: Effects of EO470 and the Import Liberalization Program", Research Paper Series No.94-11, Philippine Institute of Development Studies, Makati City.
- Tan, N.A. (1979), "The Structure of Protection and Resource Flows in the Philippines", in R.M. Bautista, J.H. Power and Associates, Industrial Promotion Policies in the Philippines, Makati City: Philippine Institute Development Studies.
- Te, Amanda (1978). An Economic Analysis of Reserve Stock Program for Rice in the Philippines,

Unpublished Phd thesis, School of Economics, University of the Philippines.

- Teruel, R., and Y. Kuroda, 2005. "Public infrastructure and productivity growth in Philippine agriculture, 1974-2000." Journal of Asian Economics 16: 555-576.
- Timmer, P. and D. Dawe (2007), "Managing Food Price Instability in Asia: A Macro Food Security Perspective", Asian Economic Journal, Vol. 21, No.1, pp. 1-18.
- Timmer, Peter (2009), "Rice Price Formation in the Short-Run and the Long-Run: The Role of Market Structure in Explaining Volatility" Center for Global Development, Working Paper No. 172.
- Umali, Dina (1990). The Structure and Performance of the Philippine Rice Marketing System, Unpublished Phd dissertation, Stanford University.
- Subbarao, K. A., U. Ahmed, and T. Teklu (1996), "Selected Social Safety Net Programs in the Philippines: Targeting, Cost Effectiveness, and Options for Reforms", Discussion Paper No. 317, Washington, D. C. World Bank.
- World Bank (2007), "Philippines: Agriculture Public Expenditure Review", Technical Working Paper No. 40493, Sustainable Development Department.
- Yao, R., Shively, G. and Masters, W. (2005), "How Successful Are Government Interventions in Food Markets; Insights from the Philippine Rice Market", Staff Paper 05-06, Lafayette: Department of Agricultural Economics, Purdue University.

ANNEX 1: DETAILS ON THE METHODOLOGY

1. Market price support

Nominal protection rates

The NPRs are computed for eight major agricultural commodities comprising nearly 80 percent of gross value added in recent years. Of these, six – rice, corn, sugar, beef, pork, and chicken – are considered import-competing; only two – coconut and bananas – are exportables.

In general, the Philippines is assumed to be a small and open economy, and thus, the country's level of trade does not affect world prices. Until recently, the country was a significant trader only in coconut products, where it has been the world's largest producer and exporter for much of the period under study. However, to a large extent, competing products such as palm oil and soybean oil may be substituted for coconut oil, which is the most important among the coconut products. Coconut oil constitutes only a small (7 percent) share of the world trade in vegetable oils.

Since 2000, the country has become the top importer of rice, accounting for 7 to 9 percent of total world rice imports in recent years. The level of rice imports by the Philippines may now be influencing the changes in the world rice price. Slayton (2008) argued that the government's frenzied buying of rice in early 2008, together with the threats of exporting countries of suspending rice exports to prevent sharp increases in their domestic prices pushed up world prices of rice. Estimates of NPRs of rice for recent years have to be adjusted to take account of the fact that the country's level of imports may now be affecting world rice price.

Border prices of agricultural crops are estimated based on the world price series reported by the World Bank.¹ For importables, the world prices are adjusted to include the cost of transport, insurance, and freight by assuming these to be at a constant 20 percent of free on board prices. Neither the country's officially recorded unit values for imports nor exports was used because foreign exchange controls, export taxes, and other taxes mean that the export unit data are significantly undervalued, particularly up to the mid-1980s. For rice, corn, and sugar, the import unit data may be either overvalued (in the case of imports by the National Food Authority) or undervalued (because private importers are seeking to lower their tariff payments by under-invoicing). There were also no imports of some importable products during various periods.

Since there were no consistent long-term world price data for pork and chicken, the import unit values for these products in Singapore are used as border prices. Although these imports may not be perfectly comparable in quality to domestically produced pork and chicken, the difference will be smaller than if the higher import unit values of Japan or South Korea were used. For beef, the NPR is simply estimated based on import tariffs, because of the wide difference in quality between the available world price and domestic price.

Rice, corn, sugar, pork, beef, and poultry are consistently classified as importables, even though there were no imports of these products during some years. In the case of sugar, the first imports occurred only in the 1990s, but, even in the 1960s and 1970s, exports of sugar were confined to the high-priced U.S. market, where the Philippines has 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 comparable to border price in the value chain of supply. For most of the agricultural commodities, we rely on the data for the commodity that is internationally traded that has undergone some light processing, rather than the data on the primary product sold at the farm-gate. Thus, we take milled rice versus palay, raw sugar versus sugarcane, frozen pork, beef, or poultry versus hog, cattle or chicken birds. In the case of sugar, the rates of the protection received by farmers and millers are the same because the revenues derived from the sale of raw and refined sugar in both domestic and U.S. markets are shared proportionately between the two by the ratio 70-30. The ratio of the farm price of palay to the retail price of rice did not change significantly over the study period, suggesting that farmers and rice millers, together with traders share proportionately in the protection accorded the rice industry. For rice, corn, pork, beef, and poultry, we assume that the NPRs of the processed products and the farm products are equivalent. In fact, import tariffs on the farm products are generally the same as the tariffs on their lightly processed products.

Aside from the major agricultural commodities specified above, we have estimated the average NPR for other, non-covered crops within the sector. In the OECD approach, that is simply assumed to be the average NPR of the covered commodities weighted by production value in domestic prices. Since agricultural policies affecting non-covered commodities often

differ from those affecting covered products, we follow the WBADI method of deriving estimates of price distortions at the border for non-covered crops, which differentiates the NPRs for exportables, non-traded, and import-competing commodities.

Price comparisons are more difficult to perform in the case of non-covered exportables, including pineapples, mangoes, abaca, and tobacco, we simply assume that the relevant NPRs is zero or equal to the export tax whenever this applies. For products that are non-traded because of prohibitive marketing costs, such as roots and tubers, the zero NPR value is assigned. Note that, as prescribed in Anderson et al (2006), a commodity is considered non-tradable if the proportion of imports and exports in the total value of production is less than 5 percent.

If 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 the NRA of the commodity as an importable, weighted by the respective proportions of the export and import values to the total traded value. For the many import-competing vegetables, fruits, and other minor crops, we assume that the NPR for the group is the same as the average NPR for covered importable products.² We also assume that the weights are one-third each for exportables, importables, and non-tradables 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 importable non-agricultural products, the NPRs are generally based on book tariff rates.³ Exceptions to the above are the lightly processed food manufacturing industries---- rice and corn milling, sugar milling and refinery, coconut oil production and refining, etc, --- where the NRAs based on price comparisons were adopted. For a number of primary industries in fishery, forestry, and mining, the NRAs from 1970 to 1985 were the applicable export taxes. Definitions of a product's tradability and other decision rules applied were the same as in agriculture. To derive the average NPRs for agriculture and subsectors, the value of production priced at free trade values were used as weights. Since the available value of production data are based on actual output prices, the free trade values were estimated by dividing these by one plus the NPR.⁴

Irrigation

Public expenditures for irrigation development reflect budgetary allocations for the construction, rehabilitation, operation, and maintenance of irrigation systems, which are spent to build and operate capital stocks. These may be treated in two alternative ways. The simpler approach is to consider them simply as part of the Government Services Support Estimate (GSSE), which most studies have done. To be consistent with the PSE framework, we estimated the annual government cost of providing (net of farmers' financial contributions) irrigation service received by farmers, which is in flow terms. Such a measure is conceptually similar to the other PSE components, and thus, may be added to the other input use support estimates to derive a more complete indicator of PSE.

Despite some data limitations, we attempted to estimate the input use support on national irrigation systems (NIS), which accounts for at least 85 percent of total public expenditures for irrigation (David and Inocencio 2010). Conceptually, this is equal to the difference between the government cost of supplying that irrigation water and the irrigation service fees paid by farmers. We focus on the financial cost of constructing, operating, and maintaining the NIS. The cost of externalities associated with the construction and operations of NIS, (e.g., the displacement of communities and destruction of flora and fauna when large reservoirs are built, soil salinization due to water logging, groundwater mining, etc.) and the opportunity cost of water when irrigation competes with other uses of water are excluded.

Estimation of annualized net government cost NIS irrigation service is a complex undertaking. It requires system level data, because each system was built at different times and is characterized by different measurement issues. Some were financed as part of multipurpose projects such as integrated area development projects. Irrigation projects may have power, watershed management, and/ or support service components where these costs need to be identified and separated. A number of projects, especially those primarily for rehabilitation are regional or nationwide in scope requiring further research to obtain system-specific project costs. Many irrigation projects, particularly the larger ones, include the construction of new and the rehabilitation of old systems, again requiring more detailed breakdown of cost. There is the question of when the capital cost of the existing infrastructure that has been rehabilitated can be considered as sunk costs.⁵

Land redistribution

Our method is predicated on market valuation of land. Since historical data on market values of agricultural land are not available, we assume that the price of land is equal to the discounted present value of the future (in perpetuity) stream of net benefits of owning land (e.g., Alston 1986; Melichar 1979; Shalit and Schmitz 1982; Jatileksono and Otsuka 1993). In turn, the annual stream of benefits can be represented by the annual rental earnings from the land (Robison, Lin, and VenKataraman 1985).

The resource transfer is estimated by the annual rental value of the land per hectare, multiplied by the number of accumulated hectares where effective ownership have been transferred to farmer beneficiaries⁶, minus the annual collection of amortization payments⁷. The rental value per hectare is estimated as the factor share of land (% land share multiplied by annual value of production) that would differ according to the crop grown on the land. Our method of estimating annual resource transfer due to land redistribution would represent the minimum, because there are other factors affecting land values, such as degree and potentials for urbanization, collateral value, and others. Data on land reform transfers is obtained from the Department of Agrarian Reform. To value farm output we use data on value of farm production per ha per year at the national level from the Bureau of Agricultural Statistics.

For redistribution of rice and corn lands under the Presidential Decree (PD) 27 issued in late 1972, the estimation is fairly straightforward. All transferred land can be assumed to be grown to rice; and that the distribution of transferred land by production environment (i.e., irrigated, rainfed, and upland) follows the national pattern. The factor share of land is assumed to be 30 percent of production value which is the typical leasehold rental on rice lands. Rentals for any second or third crop of rice are included in the yearly rentals, but not for other dry season crops, such as onions, vegetables, and others, because of lack of data. The number of accumulated hectares refers to lands on which certificates of land transfers (CLTs) have been issued. At this point, tenants have ceased paying rents to landlords, and instead made amortization payments to the Land Bank.⁸

For lands redistributed under the Comprehensive Agrarian Reform Program (CARP), the estimation of resource transfers was limited to the redistribution of private lands under the Voluntary Offer to Sell (VOS), Compulsory Acquisition (CA), and the Government Financial Institutions (GFI); that are collectively called compensable lands. No attempt was made to

estimate this for the Voluntary Land Transfer (VLT) arrangement of private lands and the distribution of public lands. According to field operation reports of DAR, "as much as 70 percent of reported lands transferred under VLT were transfers to relatives, friends, and dummies who are not legitimate beneficiaries of land reform," (Borras 2005). On the other hand, a large proportion of the distributed public lands under CARP were already under the possession of the beneficiaries even long before the start of CARP in 1987. More detailed study is required to estimate the redistributive impacts of VLTs and distribution of public lands.

Two alternative estimates of resource transfer for the GFI, VOS, and CA as a group are made. One estimate simply assumes (conservatively) that only one rainfed rice crop a year is grown on these lands; and net annual resource transfers were then computed following the same formula and factor share of land used for PD27. This is because there is no information about the actual crops grown on the redistributed lands under these arrangements collectively called compensable lands.⁹

The second estimate assumes that rice, coconuts, corn, and sugarcane are grown on the redistributed compensable lands in the following proportions: 47, 28, 17, and 8 percent, respectively. These ratios were based on the distribution of lands by crop of the sample farmer beneficiaries of CARP in 42 top provinces with the highest rate accomplishment surveyed in 2000 and 2006 by the Institute of Agrarian Reform and Development Studies. Interestingly, the estimated factor shares of corn and sugar based on different data sets (SRA) were found to be equal to 30 percent, the same as the leasehold rental we use for rice. In the case of coconut lands, which include the value of the trees, the factor share of land was higher at 65 percent.¹⁰

2. Indicators of public expenditures

Indicators of public expenditure policies and programs refer primarily to the level and composition by policy instruments of public expenditures in agriculture. Documenting and analyzing these indicators over nearly five decades from 1960 to 2008, is a difficult and complicated task. The institutional structure of the agriculture-related bureaucracy is quite complex and has been in a continual process of change. Constructing a comprehensive and consistent time-series data on public expenditures by policy instrument is further complicated by the changing budgetary structure and reporting formats. It was not until 2003 that budget-related publications at the national level became available online. Hard copies of these publications for

the period before 1987 are not complete in any of the major libraries. Indeed, copies of some of these publications for a number of years in the late 1970s and early 1980s are now missing.

Coverage and sources of data

At the national level, public expenditures for agriculture are approximated by the obligated funds (that is, liabilities legally incurred during a particular year and committed to be paid for either immediately or in the future) in support of agriculture-related policies and programs of the various government agencies as published annually in the Budget of Expenditure and Sources of Finance (BESF) by the DBM.

Up until the passage of the Local Government Code in 1991, which devolved extension and other front-line agricultural functions to local government units, governance of the agricultural sector was solely the function of the national government. By the end of 1992, about 75 percent of the DA's personnel in its regional offices were transferred to the LGUs, including all of its extension staff, most of those performing regulatory functions, and a few involved in research operations. Regional operations of attached commodity agencies for coconuts, sugar, tobacco, and fiber crops remained intact; despite the fact that these agencies perform extension and other front-line regulatory functions that should, in principle, have been devolved in LGUs. As will be shown later, however, public expenditures for agriculture continue to be spent mostly by national agencies.

Policy instrument grouping. In order to be able to analyze the trends in the level and changes in the composition of public expenditure for agriculture over almost five decades, some policy instruments had to be aggregated. Although expenditures for price stabilization by the NFA and its predecessor agencies are not considered part of public expenditures for agriculture, these are still presented and analyzed separately. The public expenditures for agriculture are then classified into five groups: (a) irrigation development, (b) land redistribution, (c) research and development, extension, and regulatory services (RDER), (d) all production support (APS) consisting of market infrastructure, rural credit and crop insurance, seeds, fertilizers, farm machineries, and postharvest equipment and facilities, and (e) other support services at the DA-OSEC.

Some differences were found between the more detailed data obtained directly from the relevant agencies, such as the DA-OSEC, NIA, and PARC, and the more aggregated data reported in the published in the GAA and the BESF. In some instances, conceptually different data have been combined to construct a long, though somewhat crude, time series estimate of public expenditures by policy instruments. Not surprisingly, therefore, the sum of our estimated expenditures by policy instrument sometimes differed from the DBM's estimated total public expenditures based uniformly on obligations of agriculture-related agencies. While some measure of inconsistency may be involved in our estimation, the trends and distributional patterns portrayed across policy instruments are, on the whole, fairly representative of the actual level and composition of public expenditures for agriculture.

Public expenditures at national level. At the national level, public expenditures for agriculture are approximated by the obligated funds (that is, liabilities legally incurred during a particular year and committed to be paid for either immediately or in the future) in support of agriculture-related policies and programs of the various government agencies as published annually in the Budget of Expenditure and Sources of Finance (BESF) by the DBM. Note that obligations are not, strictly speaking, equal to actual expenditures, though they are interchangably used in this paper. The Commission on Audit (COA) publishes audited expenditures of all government agencies, but these are not disaggregated by programs, projects, and categories that will allow classification of expenditures by policy instruments. Comparison of the two figures in the late 1970s indicate differences of less than one percent (De Leon 1983).

Obligations are funded from the total available appropriations of a government unit for any given year, which consists of the (a) new appropriations approved and published under that year's General Appropriations Act (GAA), (b) the automatic appropriations, (c) continuing appropriations, and (d) net transfers from various special funds and other government agencies.

Automatic appropriations include grant proceeds (including monetized commodity grants), revenues from taxes and licenses, earmarked customs collections such as the Agricultural Competitive Enhancement Funds (ACEF) administered at the DA, retirement and life insurance premiums of government personnel, proceeds from the sale of unserviceable equipment, and others. Continuing appropriations cover the unobligated or unreleased appropriations for maintenance and operating expenses (MOE) and capital outlays (CO) of the previous two years, and any long-term funding from special fund sources created by law. In

agriculture, net budgetary transfers to and from other agencies included special purpose funds such as the Agrarian Reform Fund, Priority Development Assistance Fund and other Congressional pork barrel, Poverty Alleviation Funds, Calamity Funds, and so forth.

A summary of all the above items for each government unit is also reported in the tables on appropriations and obligations in the National Expenditure Program (NEP) submitted yearly by the President to Congress from 1987onwards¹¹. Between 1960 and 1976, the table on appropriations and obligations was included in the BESF. No similar table could be found in DBM publications from 1977 to 1986.¹²

The BESF data on obligated funds for the DAR, ARF, and Land Bank from 1988 to 2008 were replaced by figures directly obtained from the Presidential Agrarian Reform Council (PARC), which closely monitors disbursements of all funds for the agrarian reform program from all sources. Likewise, instead of the BESF data on corporate expenditures of the National Irrigation Administration (NIA), we used figures directly obtained from the agency, which cover the total operational expenditures of the agency. ¹³ Although expenditures for price stabilization were not considered public support for the sector, we estimated a more complete measure of the governments cost NFA operations and conducted a separate analysis.

Disaggregation of public expenditures for agriculture required the use of more detailed data from the agencies concerned; even though in some cases, these may not be consistent with data used by DBM in the compilation of government obligations. In some instances also, new appropriations or planning figures were used as basis for disaggregating agricultural expenditures by policy instrument (such as in the DA's commodity programs), whenever detailed data on obligations are not available. The key is to be transparent about the sources of data and methods of estimation; and use informed judgments to determine whether and to what extent the trends and composition of public expenditures shown by the estimated public expenditures reflect reality.

Public expenditures at local level. For the local government units, public expenditure figures for agriculture and veterinary services after the 1992 devolution of extension and other related functions are based on the annual financial reports of the Commission on Audit (COA). These refer to aggregate expenditures for agricultural and veterinary services for all provinces, municipalities, and cities from 1992 up to 2003 after which data series ended; data presented from 2004 to 2008 are simple extrapolations. Better estimates can be made in the future based on

LGU unit-specific expenditure that are available at COA for the past five years. Although incomplete and the reporting LGUs varied from year to year, estimates from this database are not only preferable, further analysis of expenditures by region, income class, and other variables can be undertaken.¹⁴

Measurement issues

There are two major problems encountered in the estimation of public expenditure indicators for agriculture. The first relates to the possible understatement of public expenditures, as represented by reported obligations. The second relates to difficulties in disaggregating public expenditures by policy instrument.

Understatement of public expenditures. Obligated funds reported for GOCCs refer only to direct budgetary support from the national government. Hence, these would understate the government cost of a number of GOCCs, which obtain substantial funding from a variety of public resources as mandated by its charter. For example, the National Irrigation Administration (NIA) collects irrigation service fees, amortizations of government contributions to communal irrigation systems, and rentals of equipment purchased from appropriated funds. There are foregone tariff revenues from NFA's monopoly control of imports and tariff exemption privilege of rice, corn, and in earlier years, of wheat, soybean meal, and other food commodities. The NFA's accumulated debts from its operational losses are contingent liabilities of the government, which would ultimately have to be paid by the governments as these have already far exceeded recoverable assets and unlikely to be repaid from future earnings.

While we have been able to estimate the full government cost of NIA and NFA operations in this study where understatement is most significant, the public expenditures for the QUEDANCOR, Sugar Regulatory Administration (SRA), Fiber Industry Development Authority (FIDA), and other commodity agencies are still represented only by their reported obligated funds.

For earlier years, expenditures were underestimated by the exclusion of the portion of the fertilizer and pesticide subsidies supported through the Social Pricing and Development Adjustment Fund administered outside agriculture (de Leon 1983). For rural credit, only the administrative costs, and not the eventual losses of the Agriculture Guarantee and Loan Fund that promoted small farmer lending by rural banks, the ACA, and other government financial

institutions are reflected in the obligations of the DA. In recent years, the research and development expenditures by the PCARRD, UPLB, and perhaps also other SCUs will be understated by the amount of external grants coursed through their respective "private" foundations which are not reported as part of their obligated funds.¹⁵

Disaggregating by policy instruments. From 1960 to 1976, the BESF reported obligations at a disaggregated level, similar to the detailed breakdown (by program and activities) of new appropriations in the GAA, which enabled the estimation of public expenditures by policy instrument¹⁶. By 1977, however, obligations were reported only at an agency or sub-agency level. Except for a few agencies, which primarily perform a single function, such as the NFA for price stabilization, Fertilizer and Pesticide Authority (FPA) and National Meat Inspection Service (NMIS) for regulatory services, or Philippine Rice Research Institute (PhilRice) and Philippine Carabao Center (PCC) for research and development (R&D), most agencies perform multiple functions. Commodity agencies such as the PCA, SRA, NTA, and FIDA undertake R&D, extension, technical and market regulations, and market promotions.¹⁷

Outside the attached agencies and GOCCs, all other obligated funds of the Department of Agriculture (DA) are combined as a total amount under the Office of the Secretary (DA-OSEC). The obligations under the DA-OSEC cover all the programs of the bureaus and other offices within its central office and regional offices; and nearly all of local and foreign funded projects, including capital outlays for irrigation by the NIA. Most bureaus and offices directly under the DA-OSEC perform multiple functions including provision of production support, R&D, extension, inspection and other regulatory services, market promotion and other support services. Even the functions of the DAR, which was originally limited to land redistribution and tenure regulations, has been broadened to include delivery of support services since the enactment of the Comprehensive Agrarian Reform Program in 1987.

Other data sources. In order to derive estimates of public expenditures by policy instruments, data from a variety of sources have been used to supplement the BESF data. Public expenditures for capital outlays in irrigation and corporate activities of the NIA were obtained directly from the agency's Year-end Reports, Annual Reports, and corporate records. The use of these data sources enabled the complete accounting of irrigation investments and corporate expenditures of NIA, which was not possible when relying simply on the published BESF and

GAA data. Specifically, the irrigation components of multi-purpose projects such as the series of Agrarian Reform Communities Project, Palawan Integrated Development Project, and the like, as well as all other funds for irrigation transferred from special funds and other agencies were covered. To a large extent, expenditures for irrigation investments could be detailed by system, which was necessary for the estimation of the annualized cost of irrigation service for the indicator of producer support. Finally, corporate expenditures included all the sources of public resources as mandated by its charter (collections of irrigation service fees, amortization payments for communal irrigation projects, management fees, etc), unlike the NIAs obligations published in the BESF which included only the insignificant national government's direct budgetary contributions for the agency's operations.

From 1987 onwards, the detailed breakdown of expenditures for agrarian reform into land redistribution and beneficiary development (further broken down into credit, market infrastructure, and others), were also obtained directly from the Office of the Presidential Agrarian Reform Commission (PARC).

For the expenditures on other policy instruments that cannot be identified from the obligated funds by agency after 1977, we had to rely primarily on the General Appropriations Act (GAA), which specify new appropriations by program and activities and locally and foreign-funded projects where each of these so-called line items can be classified by policy instruments. This was the case for the expenditures of the DA's Office of the Secretary, bureaus, and regional offices, except for the appropriations for NIA's capital outlay. Expenditures for R&D and extension by the SCUs outside of the UP System were also based on the GAA because the obligated funds reported in the BESF are not disaggregated by function.¹⁸ In the case of the UPLB, research and extension expenditures were obtained directly from the University, because new appropriations in the GAA are reported for the UP System as a whole.

Limitations of GAA. The use of new appropriations to represent public expenditures is subject to several limitations. First, new appropriations may differ significantly from obligations. Note that for certain agencies, the total available appropriations (TAA) may be far higher than the new appropriations under the GAA; while reported obligations may be significantly lower than TAA. From 1987-2008 for example, new appropriations as a percentage of TAA averaged 71 percent (ranged from 50% to 95%) for the DA-OSEC. For the National Agriculture and

Fishery Council (NAFC) which administers the proceeds from foreign commodity grants, this ratio has been much lower, averaging 16 percent and ranging from 4 to 100 percent.

Meanwhile, the absorptive capacity of the DA-OSEC as indicated by the percentage of obligated funds to TAA averaged only 82 percent (ranging from 66% to 100%), caused mainly by delays in the expenditures of major capital outlays such as irrigation and other infrastructure that requires a complicated process of bidding and contracting. The apparent low absorptive capacity is typically caused by the late release of authority to spend by the DBM, as disbursements for personnel salaries and operating budget of regular programs and activities are prioritized.

Second, the appropriations for several offices, including the Bureau of Animal Industry, regional offices, etc., are not clearly itemized by function. Hence, their appropriations are classified as combined R&D, extension, and regulations (RDER). Although appropriations in some commodity agencies such as the FIDA may be disaggregated by function, we opted to use the data on obligated funds for all commodity agencies and simply classify them as RDER because of the significant divergence between new appropriations and obligations in these agencies for most of the period under study.

Third, a significant portion of new appropriations in the GAA as well as automatic appropriations and budgetary transfers from special funds or other agencies are in the nature of lump-sum funds (e.g., new appropriations for the rice, corn, high value crops, and livestock commodity programs), Congressional pork barrel funds, the ACEF, and others. In addition, a number of major local and foreign-funded projects are multi-purpose such as integrated area development projects, the Agrarian Reform Communities Project, and others. In both cases, these appropriations (and obligations available for foreign funded projects) cannot be readily classified according to specific policy instruments.

In the case of commodity programs such as the Ginintuang Masaganang Ani (GMA) rice, corn, high value crops, and livestock, we disaggregated the lump-sum appropriations by policy instruments based on distribution ratios derived from detailed financial plans for each of these commodity programs as prepared by their respective offices at the DA. For the ACEF and NAFC's commodity grants, only the list of approved projects and their amounts are available, but not the schedule of their disbursements. Thus, we used this information to characterize their

allocation by policy instrument in the text but was unable to derive a time series breakdown of their expenditures.

3. Concluding remarks

In this report we have explained how to apply the MEAP-CDP methodology to arrive at a set of policy indicators for agricultural support and public expenditure for agriculture. The methodology identifies data sources, and the procedures for processing the data in order to arrive at the policy indicators. As long as the source data is available on a regular basis, then updates of the policy indicators can also be made available regularly.¹⁹

This is a purely technical recommendation; the organizational set-up for ensuring funding and sustainability of the MEAP-CDP activity is another matter. Initially the stage of periodic monitoring of support indicators for agriculture may be implemented on a pilot phase, to demonstrate the value of such an on-going activity for budget planning and evaluation. Towards the end of the pilot phase the issue of organizational mainstreaming and sustainability can be revisited.

¹ (*default*)/*MEAP data files*/*Final_price_NRA_trade_series.xls*, beginning from column E for sheets labeled rice, corn, sugar, copra, coconut oil, beef, pork, and chicken.

² Despite the supposed removal of quantitative trade restrictions on all agricultural commodities except rice, nontariff barriers appear to be significant in the case of many commodities, such as vegetables, fruits, and meat. Price comparisons are difficult to perform for 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 effect the increased imports of a commodity that may not be grown in the country may have on the price of a highly substitutable product that is produced domestically.

³ To the tariffs in the computation of NPRs, we have added the differences between the indirect tax on domestically produced goods and and the indirect tax on imported products imposed from 1960 up to the early 1980s. While the tax rates on imports and the tax rates on exports were the same in most cases, the taxes were effectively greater in the case of imports because the tax base for imports was the tariff- inclusive price, augmented by a percentage mark-up.

⁴ NPRs are found in *(default)/MEAP data files/MPSupdated.xls*, sheet "NPRlinked". MPS calculations found in sheet "MPSlinked". [NPRs reported in final report tables are computed in a weighted average scheme documented in files in the custody of Dr. Cristina David.]

⁵ Expenditures of national irrigation projects were drawn from two main sources namely NIA annual reports for pre-1989 years and the NIA year-end reports for irrigation expenditures from 1989 onwards. Irrigation expenditures were summarized in *(default)/MEAP data files/Irrigation/CAP EXP.xlsx*, sheet "Main file". Profiles of irrigation systems from the NIA corporate planning division were summarized in *(default)/MEAP data files/Irrigation/NIS CHARAC.xlsx*. Data contained in the CAP EXP and NIS CHARAC files were used in computing for the Irrigation

support estimates in *(default)/MEAP data files/Irrigation/NIS CAP SUBS.xlsx*. Final computations were done in sheet "MEAP Summary 1970 to 2008".

⁶ Refers to the value of yearly transfers. See *(default)/MEAP data files/resource transfer_updated 27April10_MMB.xlsx* starting from column AZ for PD27 and column BB for CARP. CARP includes CA, VOS and GFI.

⁷ (default)/MEAP data files/ resource transfer_updated 27April10_MMB.xlsx, "land share in production" sheet, row 46 column BS-BX. Net resource transfer is equal to yearly transfer minus amortization.

⁸ (default)/MEAP data files/ resource transfer_updated 27 April10_MMB, "CARP-Multi-crop sheet" Column N, Row 34

⁹ (default)/MEAP data files/ resource transfer_updated 27April10_MMB.xlsx, Column BB-value of yearly transfers of CA, VOS and GFI, combined.

¹⁰ (default)/MEAP data files/ resource transfer_updated 27April10_MMB.xlsx "CARP-Multi-crop sheet"Column N, Row 34

¹¹ Data on Public expenditure for agriculture summarized in *(default)/MEAP data files/Public expenditure/public expenditure on agriculture.xlsx:* "Mtotal sheet". This is drawn from *(default)/MEAP data files/NEAPOA1987-2008 complete-summarized- combined items.xlsx:* sheet "TO". Values in sheet "TO" is drawn from total obligations per agency (see other sheets in the same file) which were encoded directly from the National Expenditure Program (NEP) reported by the DBM.

¹² Data on expenditure on agriculture (GA) from 1960 to 1986, refer to *(default)/MEAP data files/ Public expenditure/public expenditure on agriculture.xlss* sheet "Total 1960-1986 current"

¹³ (default)/MEAP data files/ Public expenditure/public expenditure on agriculture.xlsx, "Mtotal" sheet

¹⁴ For the estimates for public expenditures at local government units, see *(default)/MEAP data files/ Public expenditure/public expenditure on agriculture.xlsx:* "Mtotal" sheet column AW to AZ

¹⁵ These foundations are technically private and non-profit. Thus, they do not have to abide by government civil service and COA rules, but the members of their boards mostly ex officio officials of the government agency.

¹⁶ Obligations at a disaggregated level reported by the BESF found in *(default)/MEAP data files/ Public expenditure/BESF restructured Final*

¹⁷ See *(default)/MEAP data files/ Public expenditure/BESFagriculture* for encoded obligations reported at an agency or sub-agency level drawn from BESF. [Cannot replicate. Best guess as to the source of figure]

¹⁸ Raw data encoded in *(default)/MEAP data files/ Public expenditure/GAADA1987-2008-subtotals-11092009* "AbrWKGAA DA&AFMP_current (2)"sheet restructured in subsequent sheets and summarized in sheet 3. [Final calculations done in final file with Dr. David]

¹⁹ [Note that the method as described in this report can be replicated; the exact final figures, due to data turnover problems, are not immediately replicable. It is anticipated though that any re-calculation would not result in a significant change in the analysis and discussion.]

ANNEX 2.1: THE NATIONAL FOOD AUTHORITY

The National Food Authority is one of the most important policy instruments of the government with respect to agricultural price policy and food security, principally of rice and earlier also of corn. Its mandate is to stabilize farm prices remunerative to rice farmers and retail prices affordable to consumers. It is also expected to respond immediately (within 48 hours) to ensure rice supply (or stabilize rice prices within two weeks) during emergencies and calamities¹. To achieve these ends, the NFA has monopoly control over international trade in rice (corn and other food commodities in earlier years), conducts domestic market (procurement and distribution) operations, and manages buffer stock of rice.

1. Government cost of NFA operations

Direct budgetary appropriations (equity contributions and/or subsidy) through the GAA, corporate funds derived mainly from profits from imports of rice, corn, and other commodities, and corporate borrowings guaranteed repayment by the government finance the NFA operations². Thus, the government cost of NFA operations consists of the (a) direct budgetary support; (b) foregone tariff revenues associated with its monopoly control of imports coupled by tariff exemption privileges; and (c) the accumulated debts or liabilities, net of increases in the value of assets, which are contingent liabilities of the national government³.

Estimation issues. As reported by DBM, public expenditures for NFA (i.e., its obligations), do not fully cover all the relevant government cost of the operations of the agency. Moreover, the extent by which the reported annual obligations of the agency reflects the total government cost of its operations varied as the sources of funds and the components included in its estimation changed over time. The obligated funds of the NFA generally include expenditures funded under the GAA (as equity infusions or subsidy) and budgetary transfers from other agencies or special funds. Since 1999, a so-called tax subsidy, which is equal to the book tariff rate of 50 percent multiplied by the c.i.f. value of rice imports, has been included to represent foregone tariff revenues of the government⁴.

Note that the tax subsidy does not reflect actual foregone tariff. Under a regime of quantitative trade restrictions or NFA's monopoly control on rice and other imports, foregone

tariff should be computed based on the nominal protection rate (percent difference in domestic and border price at the same point in the value chain) and not on the book tariff. The NPR represents the tariff rate necessary to induce the private sector to import at the same level as the NFA to achieve its price stabilization goal. If the book tariff were to be actually levied on rice imports, the private sector would not have imported rice at the same level as the NFA. Indeed, the private sector may not have even imported any rice at all in the mid-1970s and 2008 when world prices were very high (NPRs were negative), because the world price would likely have been higher than the domestic equilibrium price. In this case, there is no foregone tariff; instead, a subsidy on imports would have been required to induce the private sector to import rice at the same level undertaken by NFA.

We estimated two alternative measures of annual government cost of NFA operations and their components from 1987 to 2008, which replace the tax subsidy with the estimates of foregone tariff revenues of rice and corn and add the change in liabilities net of change in assets. The first estimate of government cost (NFA A) is the sum of net obligations, foregone tariff revenues of rice and corn, and change in liabilities; while NFA B subtracts the change in the value of assets from NFA A. Direct budgetary support or net obligations typically represent the financial cost of NFA operations to the government. We argue, however, that foregone tariffs are actual costs because these could have been collected without changing the level of NPR by simply using variable tariffs, instead of conferring to NFA monopoly rights on rice and corn importations without having actually to pay any tariffs. Although the change in liabilities or net liabilities are not actual payments by the government but just liabilities incurred in those years, the government will likely have to ultimately pay these contingent liabilities.

Similar estimates for earlier years could not be undertaken because of the unavailability of the agency's financial statements and data on its imports and selling prices of wheat, soybean meal, and other commodities besides rice and corn necessary to estimate their nominal protections rates. Since the early 1970's, government support to NFA has been provided largely through its monopoly imports, tariff free, of corn, wheat, soybean meal, and other food commodities. The average NPR for rice during this period was negative and the government hardly made any budgetary appropriations to the agency. By the early part of 1986, the new Aquino government limited NFAs monopoly rights and tariff exemptions to the importations of rice and corn.

Whereas the reported liabilities of the agency are generally accurate, the reported total values of assets are likely to be significantly overstated. From 15 percent up to nearly 50 percent of the total value assets are primarily "paper assets". Up to the early 2000, these were mostly contingent assets established in the balance sheet to explain the cash shortages due from former agency officers and defaulting contractors, which though under litigation are mostly uncollectible⁵. The other paper assets are its so-called long-term investments. Prior to 2002, this was chiefly the value of stocks of the Food Terminal, Inc. (P 502 million) transferred to the agency from the defunct Human Settlements Development Corporation, but is actually worthless because of the corresponding obligation at the Development Bank of the Philippines. Starting 2003, this included the seven-year Zero Coupon Bonds totaling P16.5 billion issued by the Bureau of Treasury to NFA for use as collateral for the agency's loans from commercial banks, to extend its borrowing capacity beyond the ceiling on government guarantee.

Based on the comments and observations of the COAs Annual Audit Reports, the accuracy of the values of other major components of assets appears to be highly doubtful and likely to be substantially overstated. The inventories of domestically procured palay and imported rice, the single biggest component of assets (averaging 25% over the whole period) are generally overvalued. The ratio of damaged stocks is usually understated. Contrary to standard accounting practice, the value of inventories routinely included dispersal expenses of imported rice beyond the first terminal warehouse. Except in 2007 and 2008, the 50 percent tariff supposedly levied on rice imports (which is simply an accounting construct cancelled out by a corresponding tax subsidy) has been included since 1999. The fact that the huge inventories of imported rice accumulated in 2008 could not be sold without incurring heavy losses (COA AAR 2008) clearly indicates that the reported value of inventories is way above their current market value.

Although of lesser importance, accounts receivable may also overstate the collectible amounts due to inclusion of dormant accounts, recording errors, and general laxity in collection of receivables. Book values of buildings, machineries, and equipment would tend to be higher than their market value. Given the average share of cash and cash equivalent assets and land to total asset of only 10 to 12 percent, the true value of NFAs assets may likely constitute only 40 to 50 percent of reported value of total assets. Because of the unreliability of the annual changes in

reported assets, we focus our analysis of the estimated government cost of NFA operations on NFA A.

Estimates of government cost of NFA. Table A2. 1 presents the two alternative estimates of government cost of NFA disaggregated by its components at current prices from 1987 to 2008. Figure A2.1depicts their values in 1985 prices. Figure A2.2 compares the trends in real terms of the obligated funds, NFA A, and NFA B. Figure A2.3 shows the trends of the NFAs liabilities and assets in real terms. Table A2.2 shows NFA financial indicators at current prices.

After the abolition of the NFA's monopoly rights on importation of wheat and other food commodities in early 1986, the agency had to rely mainly on the government's direct budgetary support or net obligations to cover expected losses in its market operations until the early 1990s. This change in funding source was a deliberate policy shift in part to make the government cost of NFA operations more transparent and in part to limit the extent of its operations. There was also a concerted effort to reduce the agency's liabilities. An exception was in 1991 when the NFA had to increase borrowings in 1990 to finance the importation of nearly 600,000 mt of rice or about 13 percent of total supply to fill the expected shortfalls in production and the higher domestic procurement of palay to help farmers cope with losses due to poor weather conditions.

In a number of these early years, foregone tariffs, which would reflect profits from importations as source of funding, were positive though relatively small. This is due both to low (sometimes negative) NPRs and relatively small imports of rice during these years, as foregone tariffs for rice were significant only in 1990 and 1993. NPRs for corn have been generally higher than in rice throughout the past two decades, but imports were also much smaller.

The total government cost increased sharply from 1995 to 1998 and declined somewhat until 2007 with values ranging from P 3.2 billion to nearly P 18 billion in current terms. As world rice and corn prices soared in 2008, NFA increased rice imports to 17 percent of total supply. NPR dropped to -14 percent, and foregone tariffs on rice importation reached an unprecedented P -10 billion. Moreover, support price to farmer was increased and the ratio of palay procurement rose to 4 percent of domestic production, up from an average of only one percent in the previous five years. As a consequence, the government cost of NFA operations funded mostly by corporate borrowings reached nearly P60 billion pesos.

Since 1994, direct budgetary support to NFA has declined in real terms and as ratio to total government support. By contrast, the relative importance of foregone tariffs, especially from rice importations, has risen. Between 1995 and 2002, the share of foregone tariffs to total government cost ranged from a low of 25 percent to a high of 84 percent. As world prices of rice and corn began to climb in 2003 and the difference between domestic and border price narrowed (or NPRs declined), so did the contribution of foregone tariffs in government cost decreased down to -17 percent in 2008.

With declining profits from rice importations (or foregone tariffs), NFA operations have increasingly become dependent on corporate borrowings and the agency's balance sheets sharply deteriorated. From 2004 to 2008, financial expenses rose from P 3.2 million to P 6.4 billion in 2008, and are now greater than the cost of personnel and other operating and maintenance cost. In 2008, liabilities increased by P65 billion, as outstanding liabilities reached a record high of P133 billion. Assuming the true value of assets to be only about half of recorded assets, the government's contingent liability for NFA is at least P 100 billion.

Unless world price of rice drops dramatically in the next year or two such that foregone tariffs or profits from imports correspondingly increase, these contingent liabilities will ultimately have to be paid by taxpayers. World rice (and corn) prices may fall, though international analysts do not expect the low \$ 200 per mt prices experienced in the past to be achieved in the next few years (Timmer 2008). Furthermore judging from past experience, the liabilities of NFA continued to increase, despite the relatively high foregone tariffs during the period of low world prices (1995 to 2006). While the very high government cost of NFA in 2008 may be an exception, the average government cost of NFA operations will continue to be in the range of P 15 billion, unless liabilities are drawn down to reduce financial expenses and market operations become much more efficient.

From 1987 to 2008, the estimated annual government cost of NFA operations as measured by NFA A has been on the average about a third of public expenditures for agriculture (Figure A2.4). In 2008 when the high world rice prices led to negative foregone tariffs, the government cost of NFA operations (NFA A) funded almost solely by corporate borrowings was even slightly above the total public expenditures for the agriculture. After subtracting the overstated value of total assets, the government cost of NFA operations (NFA B) still amounts to nearly half of total spending for the sector.

These estimated annual government cost of NFA operations exclude the outstanding value of liabilities as of the end of 1986 that now equals to P 58 billion in 2008 prices. Even after subtracting around half of the corresponding value of assets then, net liabilities of about P 32 billion in 2008 prices remains a contingent liability of the government.

2. Benefits from NFA operations

NFA market operations, however, have generally served the interests of consumers, rather than farmers. Recent econometric analysis of rice market integration by Intal (2009) undertaken as part of this research project indicates that NFA domestic rice procurement was largely ineffective in influencing farm level prices regionally and nationally. This is consistent with the earlier finding of Umali (1990) that "NFA paddy procurement continued to exhibit minimal influence on farm prices". Indeed, the inefficient management of rice importing and buffer stock operations often led to abnormal seasonal price fluctuations (Bouis 1982; David 1996; Clarete 2008). Umali (1990) also found that the NFA's domestic market operations widened, rather than narrowed regional price differences; regional rice markets were intertemporally price-efficient; paddy-trading and retail-level markets were competitive; and the structure of the milling industry and government policy creating barriers to entry worked against increasing competition at the mill level.

Yao, Shively, and Masters (2005) regressed NFAs intervention variables (either change in NFA stock or change in its procurement or selling price) to changes in monthly farm or retail price at both regional and national levels. Intal (2009) similarly estimated regression equations for both the farm price and retail price at national and regional levels, but using the level of NFA procurement or distribution in addition to the change in NFA stocks as intervention variables. Both studies show that the impact of NFA interventions at the national level had been small, if any. In contrast to the YSM study, Intal's results suggest that NFAs interventions have had an effect on the retail prices on the consumer side, rather than at the procurement or production side. With a few exceptions, the regional analysis did not find statistically significant impact on either farm or retail price.

The question is whether and to what extent poor consumers benefit from NFAs implicit subsidy arising from its lower (than market wholesale price) selling price to traders and preferred

buyers. Although distributors of NFA rice is supposed to be sold at lower than market retail price, hardly any queuing by consumers or rationing device by retailers can be observed except in a few instances such as the lean seasons of 1995 and 2008. This is because traders comply by simply selling low quality rice at the controlled price, while selling at commercial prices the better quality rice purchased from the NFA (Roumasset 2000). In fact, recent COA Annual Audit Reports (2007, 2008) noted that the agency's efforts to distribute rice through preferred sellers, such as farmer cooperatives and small traders, appear to be unsuccessful. Many preferred sellers transfer their distribution (including import) rights for a price, by issuing special power of attorneys to large traders instead of undertaking the tasks themselves. Evidently, traders and not poor consumers may have largely captured the rents created by the NFA's policy of selling rice at less than market wholesale price.

Available studies indicate that only around 50 percent of the subsidies normally reach the intended poor beneficiaries (Balisacan 1995; Subbarao, Ahmed, and Teklu 1996). Given estimates for the early 1990s that the NFA incurred a cost of P 2 to P 3 for every peso of subsidy delivered to a consumer, a 50 percent leakage doubles (P 4 to 6) the cost of transferring income to the poor via the NFA rice distribution. Subbarao et al (1996) also pointed out the mistargeting of NFA rice by comparing its regional distribution to those of poor households. For example, between 1991 and 1993, Metro Manila and Cagayan Valley received 34 percent of NFA rice; and yet these regions accounted for less than 3 percent of total food poverty in the country. By contrast, the population of Southern Tagalog, Bicol, Central Visayas, Northern and Southern Mindanao, which accounted for 62 percent of total food poverty, obtained only 29 percent of NFA rice.

Undoubtedly, the NFA's monopoly control over rice imports has been responsible for maintaining a relatively stable annual average domestic price compared to the more volatile world price of rice, as evidenced by the significantly lower coefficient of variations of domestic price compared to world price of rice shown in an earlier section. We contend, however, that adopting a variable tariff regime and relying on the private sector to undertake all domestic and international market operations can minimize the impact of world price instability, at the same time attaining the same or desired measure of price protection⁶. Such a shift in choice of policy instrument used to achieve price policy objectives will not only save scarce budgetary resources spent for the costly NFA market operations, it will increase government revenues from tariff

collections. These higher revenues can then be more efficiently reallocated towards productivity-enhancing public investments in the agricultural sector and better targeted subsidies for rice consumption (perhaps in cash rather than in rice) of poor households, especially during times of high world prices of rice. Moreover, it will remove the opportunities for rent seeking (or corruption) that inevitably exist at various levels of NFA operations---direct government importation, distribution of import permits, bulk sales of rice, and so forth.

				Increase Foregone			e		
	Obligations	Tax	Net	in	Increase	tariffs		NFA A	NFA B
		subsidy	obligations	liabilities	in assets	Rice	Corn		
1987	1,169	-	1,169	-1,176	-2,645	-	100	93	2,738
1988	1,050	-	1,050	-159	-574 -104 31		31	818	1,391
1989	1,635	-	1,635	-102	-1 -39 240		240	1,735	1,736
1990	929	-	929	-994	2,815	481	553	969	-1,846
1991	996	-	996	2,873	1,536	-	-	3,870	2,333
1992	1,532	-	1,532	-2,248	-3,318	1	2	-714	2,604
1993	1,961	-	1,961	-1,384	-760	578	1	1,157	1,917
1994	2,675	-	2,675	-3,606	-1,501	2	2	-926	575
1995	1,392	-	1,392	-114	438	1,208	747	3,234	2,796
1996	1,216	-	1,216	-47	2,526	5,364	1,011	7,544	5,018
1997	1,524	-	1,524	2,719	3,654	3,956	1,057	9,256	5,602
1998	1,504	-	1,504	9,828	9,524	4,665	1,558	17,556	8,032
1999	5,015	3,356	1,659	2,528	409	3,910	633	8,731	8,323
2000	1,729	-	1,729	1,389	-2,756	3,770	2,018	8,906	11,662
2001	2,628	1,848	780	2,970	777	4,540	681	8,971	8,194
2002	961	-	961	7,612	3,593	6,619	769	15,961	12,367
2003	10,742	9,732	1,010	8,022	-748	2,994	170	12,197	12,945
2004	4,937	3,931	1,005	3,722	-3,342	1,800	128	6,655	9,997
2005	12,941	12,021	920	13,593	8,344	1,895	1	16,408	8,065
2006	4,829	3,911	918	13,843	-446	2,928	194	17,882	18,328
2007	16,635	13,926	2,709	-2,007	-1,522	5,941	550	7,193	8,715
2008	41,101	37,172	3,929	64,650	31,775	-9,987	-	58,593	26,818

Table A2. 1: National Food Authority's obligations, 1987-2008 (P Bn current price)

Notes:

Net obligations is obligations net of tax subsidy

Foregone tariffs = NFAs imports, valued at the difference between domestic and border price of rice

NFA A is the sum of net obligations, increase in liabilities, and foregone tariffs

NFA B is NFA A minus the increase in assets.

Source of basic data: BESF of DBM and notes to financial statements in annual audit reports of COA.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
					_	_			
Net operating losses	-5.5	-1.8	-5.1	-7.6	11.3	18.0	-15.8	-17.3	-36.8
Liabilities	20.9	23.8	31.5	39.5	43.2	56.8	70.6	68.6	133.3
Short-term Long-term	17.3 2.0	20.8 1.7	28.6 1.6	31.1 5.1	31.2 10.1	34.8 17.9	52.7 16.5	50.9 16.5	104.3 25.1
Assets	19.8	20.5	24.1	23.4	20.0	28.4	27.9	26.4	58.2
Fixed (eqpmt,land, etc) Cash/securities Other current assets Other assets	1.5 2.2 12.4 3.6	1.7 1.9 13.5 3.5	1.5 2.1 16.8 3.6	1.4 2.4 12.2 7.4	1.4 2.2 7.4 9.1	1.5 1.5 11.6 13.8	1.5 1.6 13.0 11.9	1.7 1.2 10.6 12.9	$ 1.7 \\ 2.0 \\ 40.4 \\ 14.1 $
Net worth									
Assets-liabilities Fixed&liquidassets-	-1.1	-3.3	-7.3 27.8	-16.1	23.2	28.4	-42.7	-42.2	-75.1
naunues	-1/.2	-20.3	-21.0	-33.7	39.0	33.0	-07.0	-03.7	129.0

Table A2.2: Selected financial indicators of the	NFA.	2000-2008
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Source of basic data: Budget, Expenditures, and Sources of Funds (BESF)







Figure A2.2: Alternative estimates of NFA expenditures, 1980 - 2008

Note: NFA is obligated funds, NFA A is NFA plus change in liabilities, NFA B is NFA B minuts change in assets, 5-year moving average.








Endnotes

¹ The NFA have also sometimes engaged in financing postharvest facilities and equipment for the LGUs and private sector and direct distribution of rice and other food commodities, but these remained a relatively small part of its program of activities.

 2 At least 95 percent of NFA operations relate to importations and domestic market operations in rice. Although to a much smaller extent, it is also involved in similar activities in corn and occasionally in sugar. In addition, it is engaged in financing of postharvest equipment and facilities, research in food quality and postharvest issues, and other activities. However, it has not been possible to separate the expenditures for these activities in the financial accounts.

³ Budgetary support to NFA also include the advances net of any repayments (or net lending) sometimes paid by the Bureau of Treasury for the agency's loan amortization. However, this forms part of the long-term liabilities of NFA and thus, is reflected in the change in liabilities in our accounting of the government cost of its operations.

⁴ In the agency's financial statement, an expenditure for tariff is recorded as part of the cost of sale, but then cancelled out through the issuance of an equivalent tax subsidy by the Department of Finance.

⁵ In recent years, these amounts were excluded from the value of assets and instead reflected as capital deficiency. ⁶ This shift to variable tariffs has been recommended repeatedly by Philippine economists since 1986 (David et al 1986; Clarete, et al 1992; David 2003; Clarete 2008). Given a substantially deeper and more stable world rice market than in the mid-1960s up to the early 1980s, Timmer and Dawe (2007) have also recently suggested that variable tariffs can be an effective alternative policy instrument for achieving domestic rice price stability in Asian importing countries at lower cost than use of parastatals.

MEAP: RICE PRICES AND THE NATIONAL FOOD AUTHORITY

Ponciano Intal, Jr., Leah Francine Cu and Jo Anne Illescas¹

Introduction

The National Food Authority (NFA) is one of the most important policy instrumentalities of the Philippine government with respect to agricultural price policy and food security. Despite its name, the government-owned and controlled corporation deals primarily with rice, the country's foremost food grain which accounts for the largest share of the food basket of the average (but especially of the poor) Filipino consumer. At the same time, rice is a major agricultural commodity accounting for a significant share of farmers in the country. Many of the rice farmers are also poor.

NFA is tasked to stabilize the price of rice consistent with farm prices that are remunerative to the country's rice farmers and retail prices reasonable enough for the country's consumers. Also, it is mandated to respond immediately (within 48 hours) to ensure supply of rice during emergencies and calamities and stabilize rice prices within two weeks in the calamity-stricken areas to levels prior to the calamity or emergency (Coffrey International Development, 2007, p.27).

Clearly, the mission of NFA is daunting and almost a recipe for failure. To a large extent, this is because NFA is tasked to address potentially conflicting objectives for consumers and rice farmers. At the same time, the organization has to be agile to be responsive in times of calamities, spread out geographically to meet rice supply and demand pressures all over the country (in the light of a relatively inadequate infrastructure and logistic system in the country), and efficient enough to be competitive with the private sector in the provision of rice marketing services.

Not surprisingly, NFA's performance over the years has been extremely mixed. The basic issue is whether the society's investment in NFA has been worth it given the resources put into the corporation.

¹ Professor of Economics and students respectively, De La Salle University-Manila

If not, what can be done to address the fundamental concerns being pursued by NFA, which are rice price stability and food security.

The paper examines the performance of NFA during the past decade or so, examines why and presents policy recommendations accordingly.

Price Stabilization and Food Security: Some Analytics

Virtually all countries have intervened in the market pricing of food grains to promote price stability. The most common method of intervening is the use of buffer stock usually in tandem with trade policies (see Islam and Thomas, 1996, pp1-2). The Philippines is no exception to this. In developing countries, the management of the buffer stock is usually handled by a government instrumentality. In the Philippines, it is the National Food Authority that has the mandate to manage the country's buffer stock of rice, the country's key food grain.

There is some political logic to price stabilization of basic food commodities like rice. Rice accounts for the largest share of the food basket of poor and near poor Filipinos. And food costs constitute the largest portion of the Filipinos' overall budget. Finally, a significant share of Filipinos hovers near the poverty line. Thus, large hikes in the price of rice can push a large number of Filipinos into poverty unless the price hike happens together with a corresponding increase in their household incomes (which is likely unlikely especially for poor urban consuming households). Similarly, rice farmers are the most numerous farmers in the country, and a large proportion of them is poor or near poor. Thus, significant price falls of palay, especially during the peak harvest season, have significant adverse impact on the incomes and poverty status of the rice farmers, especially because most of them do not have the wherewithal to hold off the sale of their harvest due to credit and storage constraints. Both the poor and near poor rice consumers and the rice farmers are major voting constituencies in the country.

The importance of rice price stabilization is even more highlighted in a paper (2002) by the DAI Food Policy Advisory Team in Indonesia, probably mainly authored by Peter Timmer, for Indonesia's BAPPENAS. The paper emphasizes that food price stability, especially rice price stability, is a critical element of what is the East Asian approach to food security. Specifically, the approach that can be

termed "growth mediated food security" consists of rapid economic growth that benefits the poor combined with food price stability. This is food security at the macro level wherein "policymakers have an opportunity to create the aggregate conditions in which households at the "micro" level can gain access to food on a reliable basis through self-motivated interactions with local markets and home resources" (p.23). Rapid economic growth is the long run solution to food security through the Lorenz curve, because at the resulting much higher per capita income, the share of food expenditures to total family expenditures declines dramatically and therefore significant price swings of rice prices would only have minor adverse welfare effects. In the short run however, it is the relative price stability of food, especially rice, which gives the sense of food security to households. Food and rice price stability can have macroeconomic benefit through possibly less overall inflation rate and less variable overall inflation rate, which would likely lead to improved investment climate and higher rate of investments thereby engendering a more robust economic growth rate.

For countries with relatively large population like the Philippines or Indonesia, food (rice) security has a large element of the drive for self-sufficiency because of the relative thinness of the world rice market as compared to the world wheat or corn markets. Global rice trade volumes are only about a fifth of global trade in wheat; and the ratio of internationally traded rice is only about 5 percent of world production as compared to about 20 percent for wheat (and 15 percent for corn). This relatively thin market has meant that historically world rice prices have tended to be more unstable that world wheat prices. As a result, rice importing countries have tended to insulate their domestic markets from the volatility of world rice prices. (See DAI, 2002, pp.31-33.)

Three nuances of price stabilization. There are three nuances of price stabilization that are of interest. The **first** is the most politically cogent, which is that when there is an emergency or calamity, the supply of rice is restored and the price of rice stabilized the soonest possible. Where the transportation and warehousing infrastructure is not well developed, a calamity or emergency leads to private hoarding and possible sharp hikes in the price of rice, which will aggravate further the emergency condition. Thus, government intervention to restore rice supplies and temper price hikes during the emergency is needed. This is done primarily through a strategic rice reserve for such eventualities and stored at various locations in the country for quick response. In addition, the government tends to become more vigilant with respect to its regulations against hoarding of basic commodities during emergencies in affected areas.

Note also that government intervention through the provision and activation of an emergency rice reserve addresses both the first nuance of price stabilization, and probably more importantly, that of food security during emergencies.

The **second** nuance of price stabilization is to temper the seasonal variation of the price of rice within a year. Given that rice is consumed continuously and regularly the whole year round while domestic production is seasonal, there is inevitably some seasonal variation in the price of rice such that it is lower during the harvest season and higher during the lean season. The market allows for the seasonal price variation in order to pay for the storage and handling services of traders so that there is some domestic supply even during the lean season. Tempering this seasonal variation in the price of rice means that the price of rice, especially palay, is higher than the market price would be without government intervention during the harvest season (which rice farmers with marketable surplus would like) while the retail price is lower than the market price without government intervention during the lean the market price without government intervention during the harvest season (which rice farmers with marketable surplus would like) while the retail price is lower than the market price without government intervention during the harvest season (which rice farmers with marketable surplus would like).

That there is seasonal variation in the price of rice both at the farm gate and at the retail level over the course of a year does not necessarily call for possible government policy intervention as such. This is because the seasonality of rice price is a known reality and is therefore incorporated in the pricing information that shapes expectations and decisions of rice farmers (especially) and even possibly of rice consumers (hopefully). What gives policy salience with respect to the second nuance of price stabilization is that the volume of rice production is uncertain due to weather and pest factors among others. This means that farm prices can spike up or register large droops during harvest season due to such production uncertainties, thereby immediately affecting the incomes and welfare of rice farmers accordingly. Such production shocks can also affect the consumer market and the consumer price down the road if there is no appropriate inventory management response either in terms of inventory drawdown (or increase) and/or imports (or exports) of rice.

To effect the second nuance of price stabilization, the government tempers the seasonal variation of the price of rice primarily through the purchase of palay during harvests and the sale of rice especially during the lean months. In case there is an overall shortage of rice for the whole year, the government

would need to import rice to augment domestic purchases primarily for the lean season. This is essentially what the National Food Authority does in its price stabilization mission.

It needs to be emphasized though that what NFA does is also what the private sector does in rice trading. The private sector purchases rice during harvests, sells to consumers all year round, and if allowed by the government and is profitable, imports rice to meet domestic supply shortfalls. In either the NFA or the private sector, resources are expended for the cost of domestic purchases, storing, transporting, processing, importing or exporting, and selling. The challenge is to ensure that the marketing margin is reasonable enough in order for the traders to have reasonable profit but at the same it is not too high at the expense of consumers. The marketing margin must be enough to pay for the cost of all marketing related costs plus reasonable profits (on the average in the course of several months or years) in order to make the provision of marketing services sustainable. In short, the trading, storing, transporting and processing stage needs to be as efficient as possible in order to minimize the marketing margin

If the government intervenes in the marketing stage through a government corporation such as the National Food Authority, the challenge is to minimize the subsidy cost (if any) of government intervention in the rice marketing stage consistent with the price stabilization and food security concerns of the country. Heavy subsidization by the government in the marketing stage can have distortionary effects on the rice marketing system. The most long lasting adverse effect is that unclear and haphazard interventions by the government entity lead to business uncertainty which discourages the private sector to invest adequately in facilities, systems, and relationships needed for greater efficiencies in the rice marketing system. There are some economies of scale in the marketing system. The better integrated the system is and the more adequate facilities are, the lower the cost per unit of rice marketed would be, which can potentially benefit either the consumers (through lower retail prices) or the farmers (through higher farm gate prices) or both.

It needs to be pointed out that the **economic basis** for government intervention in the marketing system is far less apparent in the second nuance of price stabilization than in the first nuance. In terms of efficiency considerations, the possible basis for government intervention is that there are significant inefficiencies in the private rice marketing system either because of possible lack of competition or because the private sector does not have the wherewithal to invest in the appropriate facilities and

systems for efficient rice marketing (which presumably the government intervention would address). There is an implicit assumption therefore that the government instrumentality involved in rice marketing (e.g., National Food Authority) would be more efficient and have better facilities than the private sector. If in fact the government instrumentality is **ex ante** expected to be less efficient than the private sector and therefore needs to be subsidized, then the basis for government intervention (for this second nuance of price stabilization) is purely for **non-economic or political** reasons.

The **third** nuance of price stabilization is that the domestic price of rice is more stable than the world price of rice; that is, government intervention is such that domestic rice price for consumers is more stable than the world price of rice. In a completely open rice economy, the domestic price of rice would largely follow the gyrations in the world price of rice adjusted for changes in the exchange rate (as well as possible changes in the tariff rate on rice, which tends to be constant or are changed very infrequently or change very little over time, and international shipping costs for rice). Domestic supply and demand gaps are addressed through export and import of rice. Government intervention in the third nuance of price stabilization rests on the assumption that the gyrations in the world price of rice are too large for political comfort in the domestic arena; thus, the need for government intervention in order to shield the domestic economy somewhat from the presumably volatile world price of rice.

Assuming that there is some basis for de-linking the domestic rice price from the world rice price movements, the government has two alternative approaches for doing so. The **first approach** is for the government to still rely on the private sector to import and export rice but where the tariff on rice is adjusted to counteract the movements in the world price of rice. In this case, domestic price stabilization is undertaken through a variable tariff system such that the import tariff on rice is decreased when the world price of rice is high and is correspondingly increased when the world price of rice is low. In this intervention strategy, the government can rely fully on the private sector in rice trading with respect to imports and exports. The government does not have to expend resources to support a government instrumentality like the National Food Authority to undertake domestic price stabilization relative to world prices. Indeed, the government can potentially even earn from this approach through the tariff revenues from levies on imported rice.

The **second approach** is to have a government entity like the National Food Authority managing buffer rice stock and having the sole (or dominant) authority to import and export rice. In this case, de-linking

domestic price from the world price of rice is determined solely on the pricing decisions of the government entity in the domestic market(s). The second option entails a lot more resources from the government as compared to the first option. The choice of the second option stems from a specific price stabilization strategy, which is the reliance on a government buffer stock policy managed by a government instrumentality like the National Food Authority. A corollary of the buffer stock strategy is that the government would rely on importing and exporting by the government instrumentality instead of on the use of variable tariff rates on private importation or exportation of rice. Implicit in this government preference for the second option is the assumption that the private sector has less leverage vis-à-vis foreign exporter-suppliers (or foreign importer-buyers as the case may be) or that it has less resources—financial or otherwise--than the government to undertake import and export of rice. Both presumptions do not seem to be compelling because international rice trading is primarily commercial involving substantially the private sector in the export countries (e.g., Thailand) and because the private sector has in fact greater financial wherewithal than the perennially financially strapped Philippine government. The more likely reason for the Philippine government not relying on the first approach to domestic price stabilization via the private sector trading cum variable tariff is that the second approach is the logical extension to the international trading arena of the buffer stock-cum-price stabilization strategy relying on a government instrumentality in the domestic economy.

Requirements for effective public buffer stock management. In their review of the experiences of developing Asian countries in price stabilization through buffer stock management in tandem with the use of trade policies, Islam and Thomas (1996) state the following as the conditions for a successful and effective program, quoting verbatim (p.2):

- 1. The buffer stock agency must have an assured, flexible access to adequate financial resources since its requirements cannot be predicted.
- 2. The buffer stock agency must be in control of the timing of its purchases and sales. Inappropriate timing would detract from its ability to influence market prices.
- 3. Public stocks must be properly managed. Cost-effective purchases and sales must be made and stocks must be rolled over frequently to avoid spoilage in storage.
- 4. Timely and efficient management is also essential to avoid counter-speculation, when traders, lacking confidence in the public agency, refrain from buying in times of surplus and buy rather than sell in times of shortage.

5. If publicly held reduce or substitute for private storage, the success of the public effort is compromised. Policies should encourage private trade; otherwise the cost of public stock will be higher.

In summary, there is some compelling basis for the government to intervene in rice distribution in times of calamities and emergencies. The intervention is primarily through the maintenance of an emergency reserve. The economic basis for the government to intervene in rice marketing in order to temper the seasonal variation in rice prices rests ultimately on the presumption that the private sector is less efficient and effective in providing the needed marketing services from the farm to the consumer than the government agency. Similarly, the economic basis for the government to intervene through the public management of a buffer stock plus the control of imports and exports of rice rests on the presumption that this is a more expeditious and effective way of stabilizing domestic rice prices relative to world rice prices rather than the reliance on the private sector to undertake the appropriate importing and exporting of rice together with the imposition of flexible and variable tariffs (and negative tariffs or subsidies where appropriate). However, as the lessons of the developing countries in managing buffer stock cum trade policies for price stabilization of food grains indicate, the conditions in order to have an effective and efficient public agency managing the buffer stock are extremely stringent indeed.

Rice Prices

Domestic and international prices and price stabilization. Table 1 presents the average annual deflated prices of rice for the whole Philippines at the farm, wholesale and retail levels during the 1990-2008 period.. The data are deflated using the consumer price index for the Philippines with 1994 as the base year. **Table 1** shows that the period 1990-2008 is characterized by two notable price spikes; i.e., 1995-1996 and 2008 with the highest being during the 1995-1996 period. Nonetheless, excluding the two price spikes, the real price of rice has largely been relatively stable without any pronounced secular trend.

As will be discussed later in the paper, the price spike in 1995-1996 was largely domestic in origin while the price spike in 2008 was global (but where nonetheless the Philippines played a significant role as the world's largest rice importer during the year). Excepting the two price spikes, the relative stability of the real price of rice is consistent with the price stabilization concern of the Philippine government. However, as will be discussed later, the price spikes are to some extent endogenous to the decisions and operations of the government's rice intervention strategy through the National Food Authority.

Table 2 compares the international price of rice and the Philippine wholesale rice price. The international price is represented by the f.o.b. Bangkok price of Thai rice, 35 % brokens. This is likely of a lower quality than the average Philippine rice by the 1990s, although this is what may be relevant for the provision of rice reserve for emergencies as well as the rice for the poor. (The lower the percentage of rice brokens is, the higher the quality. Cristina David uses an average of the price of Thai rice 15% brokens and Thai rice 35% brokens in her computations of the nominal rate of protection. However, this is essentially a synthetic price, not a real market price.) Nonetheless, the prices of the Thai rice of different percentage of rice brokens tend to move together. Because the Philippines imports much of its rice for the Philippine domestic rice price. However, the series starts in 1998 only and is intermittent (i.e., there were some months when there were no published export quotes). Thus, for longer period analysis, the Bangkok price at 35% is used in the paper (there is no series for 25% brokens for Bangkok rice). There is a strong correlation in the movement of prices of the Vietnam export quotes and Bangkok f.o.b. price, as reflected in the following regression:

Ln PV = 1.107 + 0.878 Ln PB(6.3) (46.7)

Adjusted R squared	=	0.95
RSME	=	0.056
Ν	=	118

Where

PV	=	Vietnam export price in US dollars
PB	=	Bangkok F.O.B. 35 % brokens in US dollars

Table 2 shows that the world price of rice in US dollar terms declined somewhat in the early 1990s, then shot up in 1995 to resume a gradual price decline until it reached bottom in 2001, after which there was a secular rise in the price capped by a sharp peak in 2008. Thus, the world price of rice during the 1990s and the 2000s can be characterized by two price cycles with price peaks in 1995 and in 2008. The pattern of Thai fob rice price in dollar terms is similar to the pattern of rice price movements domestically, which seems to suggest that domestic prices follow international prices. However, what matters for the domestic market is the peso value of the imported rice (and adjusted for handling and transport costs). Because the peso-US dollar rate changed substantially during the period, with major depreciation episodes during 1997-2004 before a significant peso appreciation in 2007, the pattern of the international price of rice in peso is heavily muted by the exchange rate changes. What comes out is a pronounced secular rise in the price of international price in peso terms during the period, highlighted by the sharp rise in 2008.

Figure 1 puts in starker relief the significant difference in the movement of the international price of rice in peso terms and of the domestic price of rice. Specifically, the domestic price of rice (in terms of the wholesale price and even of the farm price) was very much higher than the international price in peso terms (and adjusted for transport and handling costs) during the 1990s, especially in the early 1990s when the implicit nominal rate of protection of domestic rice was much more than 100 percent. The nominal rate of protection remained high in the latter 1990s, measuring more than 50 percent, but declined dramatically by 2004 to about 10 percent or less as the foreign price of rice started substantial rise while domestic prices continued to decline secularly since 1996 albeit very slowly. Indeed, as the rise in the international price of rice gathered further steam while domestic prices remained relatively stable until 2007, the nominal rate of protection turned zero or negative during 2005-2008. **Figure 1** also shows the Vietnam rice export price beginning 1998. The discussion above remains the same for the Vietnam price as the international referent price. (**Appendix Figures A.1 and A.2** show the yearly comparison between the Philippine wholesale price and Thailand export price (35 % brokens) and Vietnam export prices (25% brokens) respectively in peso terms and adjusted for transport and handling on a monthly basis.)

 Table 2 and Figure 1
 are all at current prices; i.e., not deflated. They bring out most forcefully the implicit major objective of the government's rice price policy, which is apparently one of rice price

stability at current prices. The government has largely succeeded in its objective during the period despite significant gyrations in the exchange rate and in the world price in dollar terms. The exceptions include 1995-1996, which had political impact in the sense that the sitting administration's senatorial team did not fare well during the elections in part because of the sharp rise in the price of rice. The price peak in the domestic market in the mid-1990s is primarily determined by domestic factors. Indeed, David (1997) attributes the 1995-1996 price peak as primarily a result of policy failure. The other exception is the recent "global rice crisis" of 2008, which some analysts view was partly caused by the overreaction of both the major exporting (e.g., India, Vietnam, Thailand) and importing (read: Philippines) countries to a tightening global rice situation as reflected by the secular rise in the world price of rice since 2003.

Below are regressions of the Philippine wholesale price of rice on the Bangkok export price (35 % brokens) for 1990-1998 and selected sub-periods, where PP is the Philippine wholesale price of rice and PT is the Bangkok f.o.b. price in peso terms and where the numbers in parentheses are the t-values:

1990-2008

In PP =	10.796	-	0.111 ln PT				
	(60.4)		(-5.7)				
ŀ	Adjusted R squared	=	0.13 ;	F	=	32.4	
F	RMSE	=	0.102;	Ν	=	218	
1990 -	1996						
In PP =6.545 +		0.37	0.370 ln PT				
	(11.5)		(5.8)				
ŀ	Adjusted R squared	=	0.28;	F	=	33.1	
F	RMSE	=	0.103; N	=	84		
1997 - 2	2008						
Ln PP =	11.325	-	0.168 In PT				
	(52.9)		(-7.4)				
A	Adjusted R squared	=	0.29;	F	=	54.7	

	RMSE		=	0.074; I	N	=	134	
1990 –	1994							
In PP	=	11.567	-	0.204 In	РТ			
		(17.3)		(-2.7)				
	Adjuste	ed R squared	=	0.10;		F	=	7.3
	RMSE		=	0.07;		Ν	=	60
1994 –	1996							
In PP =	=3.81	+	0.676 l	n PT				
		(3.9)		(8.2)				
	Adjuste	ed R squared	=	0.65;		F	=	66.7
	RMSE		=	0.07;		Ν	=	36
1997 -	2000							
In PP =9.801 +		+	0.005 l	n PT				
		(19.801)		(0.1)				
	Adjuste	d R squared	=	-0.02;		F	=	0.01
	RMSE		=	0.058; I	N	=	48	
2001 –	2004							
In PP =10.546 -			0.091 l	n PT				
		(61.2)		(-4.9)				
	Adjuste	ed R squared	=	0.33;		F	=	24.4
	RMSE		=	0.02;		N	=	48

The regression results above indicate that Philippine wholesale rice prices moved somewhat against the Bangkok export price for the whole 1990-2008 period, primarily during the 1997 – 2008 sub-period and most especially during the years since 2001. As will be shown later in the paper, the years since 1997 can be characterized by the greater effort of the National Food Authority towards rice price stabilization

as reflected in the rise of its rice stock and in the expenses for rice operations during the period. This appears to show the political importance given by the government to rice price stability after the results of the senatorial elections in the mid1990s; in short, rice is a political commodity in the country.

Table 2 and Figure 1 also show that the very high nominal rate of protection of the early 1990s eventually turned into a negative rate of protection by the mid 2000s. This remarkable shift in the nominal rate of protection has tremendous impact on the National Food Authority's operations and budget. The very high rate of protection could provide NFA some buffer on its finances (i.e., NFA could import rice cheaply and sell it at a much higher price domestically) in much of the 1990s. However, the pursuit of rice price stability domestically in the face of soaring international price in peso terms, which resulted in the sharp drop in the nominal rate of protection and the eventual turn to negative rate of protection, could only be done through heavy government subsidies of NFA operations.

Similarly, **Table 1 and Figure 1** suggest that the implicit policy bias of the Philippine government during the 1990-2008 period has been an overriding focus on rice consumers through rice price stability especially since the latter 1990s. The support to rice farmers through some reasonable rate of protection was largely a secondary corollary to the pursuit of rice price stability in the context of the changing international market conditions for rice.

National and regional rice prices, marketing margins and price volatility.

Figures 2 to 4 show the pattern of average annual farm, wholesale and retail prices of rice from 1990 to 2008 by region. The figures suggest the following:

- 1. Rice prices tend to move reasonably closely among the regions.
- Farm gate prices seem to be more volatile than retail prices, and possibly even than wholesale prices.

The last observation that farm gate prices tend to be more volatile than retail or even wholesale prices is corroborated by **Table 3a** which shows the standard deviation of (deflated) farm gate, wholesale and retail rice prices for the whole country annually during 1990-2008 and by **Table 3b** which presents the

standard deviation estimates at the regional level during the period. (**Appendix** Tables **A.1.a-A.1.c** present the standard deviation estimates per year.) The tables show that the standard deviation measure for farm gate prices is higher than those of wholesale prices and retail prices except most notably in 1995 when retail prices zoomed up. The table also suggests that wholesale rice prices tend to be more volatile than retail prices.

This pattern on relative price volatility among farm, wholesale and retail prices is probably not surprising because the storage function of the private sector is meant partly to help stabilize prices at the wholesale and retail levels. At the same time, the stability in the price of rice at the retail level is precisely the key objective of government intervention in rice marketing through buffer stock management. Thus, the greater stability in the price of rice at the retail level by the normal storage function of traders as well as by government interventions in rice marketing. The challenge is to determine whether indeed the government intervention was the dominant factor for the greater stability of the price of rice at the retail level.

Figures 5-7 show the monthly pattern of (deflated) farm gate, wholesale and retail prices of rice for the period 1990-2008. The tables show that prices are clustered within a narrow band, except for a few years most notably 1995, 1996 and 2008. As the tables indicate, rice prices shot up in the latter 1995 and early 1996 before gradually declining by the latter 1996; similarly, there was a sharp rise in the price of rice during the second and third quarters of 2008 before declining afterwards. Those three years of markedly different pattern of the movement of the price of rice are related to the sharp price increases that were noted earlier during 1995-1996 and the year 2008. Excepting the three outlier years, the clustered prices suggest that there is some seasonality in the prices of rice, more pronounced for farm prices (with lower prices in the last quarter of the year) and less so for retail prices (although rice prices tend to rise somewhat during the third quarter of the year).

The clustering of prices in **Figures 5-7** is also evident among regions. For the most part, there is strong correlation between regional wholesale prices and Manila wholesale price during much of the period. Nonetheless, the correlation is not hard and fast; indeed, there are significant annual variations as well as differences in the extent of price correlation among the regions vis-à-vis Manila (see **Tables 4**). Two-thirds of all the regions have correlation coefficients with Manila wholesale rice price of at least 0.90 and the rest in the 80 percent. The lower correlation coefficients are largely in Mindanao. The same

apparent weaker linkage between Mindanao wholesale prices and Manila prices is echoed in the results of regressions of regional wholesale prices on wholesale price of Metro Manila and on the previous month's regional wholesale price (see **Table 5** and **Appendix Table A.2**). The tables show that the long run coefficient is close to one (1) in most regions of Luzon and Visayas (and interestingly, ARMM) but the long run coefficients for most Mindanao regions hover in the 70s percent. It is possible that the long distance between Manila and Mindanao is a factor such that shortages and surpluses among Mindanao regions are mainly handled within the island and perhaps from Western Visayas, and not from Luzon. This likely allows for some de-linking of Mindanao prices from Manila prices.

From **Tables 4a and 4b** there also seems to be indication also that the correlation improves especially during periods of high price increases. This is probably not at all surprising because the shortage of domestic supply at the national level ultimately reverberates into the whole rice marketing system across the country.

Figure 8 presents the ratio of wholesale price of rice in the various regions of the country to the wholesale price of rice in Metro Manila. **Figure 8** brings out interesting insights. The *first one* is that a number of the regions have lower wholesale prices than in Metro Manila while a few others have higher wholesale prices than Metro Manila. The regions which have largely higher wholesale prices than Metro Manila (e.g., ARMM, CALABARZON, Eastern Visayas, and Central Visayas) tend to have mainly rice deficit provinces. Similarly, those regions which have lower wholesale prices than Metro Manila tend to have more provinces that are either self-sufficient or are surplus provinces in rice. The result is probably not surprising among rice deficit regions in the sense that Metro Manila is the main domestic market and therefore the transport and storage facilities are geared more for the main market called Metro Manila. Note however that a number of the rice deficit regions are poor regions, which means that the comparatively higher price of rice in the poor but rice deficit regions will have more adverse effect on the relatively poor regions.

The *second* interesting insight is that the ratios of regional wholesale rice prices to Metro Manila's wholesale rice price jump up and down during the period. This suggests that there does not seem to be a strong correlation between the regional wholesale price and the Manila wholesale price of rice in the short run. This result is well corroborated by both the elasticities from regression results in **Tables 5** and the correlation coefficients in **Tables 4a and 4b. Table 5** shows the results of the natural logarithm of

the deflated regional price as a function of the natural logarithm of the deflated Manila wholesale price and the one period-lagged logarithm of the deflated regional wholesale price. The results show that there is not that strong relationship between the Manila wholesale price and the regional price in the short run (i.e., within a month) but that there is strong relationship in the long run. **Appendix Table A.2** presents the regression results more starkly. The annual correlation coefficients vary substantially, with a few cases of even negative correlation between regional wholesale prices and the Manila wholesale price. Over the 1990-2008 period, however, the correlation coefficients between the regional wholesale prices and the Manila wholesale price are very high, in many cases in the 90 percent range. There is some regional variation. The regions with the strongest price correlation with Manila are Regions 3 (Central Luzon), 4 (Southern Luzon) and 5 (Bicol), which are essentially the neighboring regions of Manila, as well as Region 7 (Central Visayas), which is another key rice deficit area. The regions with the weakest price correlation with Manila during the 1990-2008 period are the Mindanao regions, except for ARMM which is somewhat surprising given the high transport and logistics cost of moving goods between ARMM and Metro Manila.

A comparison of the volatility of rice prices during the 1990-2008 period with those of the 1974-1986 and 1957-1963 periods indicates that seasonal variation during the 1990s and 2000s was less than during the 1970s and the 1980s, which in turn was also less than during the 1957-1963 period (see **Table 6**). Umali (1990, p. 194) attributes the lower seasonal price variation in the 1970s and 1980s as compared to the late 1950s and early 1960s to (a) the shift of rice production from rain-fed to irrigated water systems, (b) government rice distribution since NFA was"... relatively successful in defending the rice ceiling price during the period 1974 to 1986" (p.194), and (c) improvements in internal transport. The greater price stability of rice in the 1990s and 2000s is likely similarly caused by (a) more even rice production, (b) improvements in internal transport, and (c) government rice distribution. Especially since the late 1990s as the National Food Authority expanded its rice buffer stock.

Prices, Marketing Efficiency and Policy

The ratios of farm price to wholesale price, wholesale price to retail price and farm price to retail price during 1990-2008 by region are presented in **Figures 9-11** respectively. The figures indicate that the wholesale to retail price ratio was relatively stable over the period while the ratio of farm price to

wholesale price declined somewhat from the mid-1990s until the early 2000s before inching up again, although to a level that was still lower than in the early 1990s. The result begs for some explanation. One is that macroeconomic variables play a big role. Specifically, storing and transporting rice entails costs including financial costs. Higher interest rates lead to higher inventory costs, and, other things being equal, to higher marketing margin. Nominal interest rate largely declined secularly during the period while the real interest rates was more volatile with no clear pattern in the early 1990s but largely secularly declined since the late 1990s except for a sharp rise in 2007 (see **Figures 12a and 12b**.). **Figures 12a and 12b** juxtapose the annual average ratio of farm price to wholesale price with the nominal and real interest rate declined secularly during the 1990s but the two diverged in the 2000 with the nominal interest rate declined secularly during the 1990s but the two diverged in the 2000 with the nominal interest rate declining further overall while the ratio of farm price to wholesale price inched up. The pattern in the 2000s is more consistent with the ex ante expectation of an inverse relationship between the two. However, that the two were positively correlated in the 1990s suggest that there are other factors, perhaps more important, that influence the ratio of farm price to wholesale price.

The ratio of farm price to the wholesale price and the ratio of farm price to the retail price are the indirect measures of marketing margin. The lower the ratios are, the higher is the marketing margins are. Although low ratios may indicate market inefficiency, there are likely other factors that can lead to the low ratios. In this regard, it would be useful to compare the Philippine ratios for rice with those of other countries (see **Table 7**). It is apparent from the table that government intervention plays a significant part in the determination of farm price, with an impact on the ratio of farm price to wholesale price. This is exemplified by India where is the ratio is equal to 1 or even slightly higher, suggesting that farm price and/or wholesale price is heavily subsidized so much so that the ex post ratio does not capture the cost of marketing. Similarly, the ratios for Thailand during 1996 and 2000 are suggestive of heavy government intervention, probably a high farm support price that masked the true cost of marketing. Clearly, in these cases, macroeconomic factors such as interest rates will have no bearing on the ex post ratio of farm price to the wholesale price. **Table 7** seems to indicate that Philippine marketing margins are lower than for Bangladesh and possibly Indonesia but higher than Thailand. In both Bangladesh and Indonesia, the marketing margin appears to be increasing while the margin in the Philippines has declined as a proportion of the wholesale price in recent years.

In view of the above discussion, it is not feasible to use the ratio of the farm price to wholesale (and correspondingly, the ratio of farm price to the retail price) to examine the relative efficiency of the rice marketing system as well as the impact of government intervention on rice marketing and rice prices. To examine the above, the paper uses two regression models that have been used to determine the efficiency of the rice price system and the impact of government policies on rice prices. The two regression models are the so-called Ravallion-type models used by Umali (1990) and the regression models utilized by Yao, Shively and Masters (2005). The use of the two models is deliberate in that comparisons could be made with the authors' results and therefore provide a longer run and hopefully more robust evaluation of the rice marketing system and government policies.

Ravallion Regressions. Ravallion regressions can be used to test market integration between marketing levels, and thereby provide indication of the efficiency of the market system.; Umali (1990) may be the first to use Ravallion regressions to examine the Philippine rice marketing system. This paper follows Umali in part to compare her results for the 1970s and 1980s with the findings of the paper which focuses on the 1990s and the early 2000s, thereby providing insights into the evolution and effectiveness of the Philippine government interventions in the rice industry over the past few decades. Geographically separated markets are integrated when prices in the said markets "...move together in response to stimuli from changing demand and supply and other economic conditions." (Farruk as quoted by Umali (1990, p.143). The faster and more accurate prices in the said markets react to such stimuli, the more integrated they are. (Ibid.) Informational, infrastructural and logistic, and policy barriers will reduce the degree of integration of markets. As a result, markets become less efficient as mechanisms for the allocation of scarce resources. At the extreme where markets are not interlinked at all, gluts or deficits in one market could not be readily be addressed by the appropriate movement of goods and services to and from other markets. The end result is lower social welfare to the whole economy. Market integration can be horizontal within the same marketing chain (say the wholesale markets of a given commodity like rice in various regions of the country) or vertical between marketing or processing levels situated in various locations of the country (e.g., farm, wholesale, retail). The degree of market integration can differ in the short run from the medium or long term, with the expectation that markets tend to be more interlinked and integrated in the medium/long term as against in the short term.

Following Umali (1990), the Ravallion regression equations used to test for market integration between levels (i.e., farm, wholesale and retail) are as follows:

$$PF_{it} = \alpha_{i}PF_{it-1} + \beta_{i0}(PW_{it} - PW_{it-1}) + (\beta_{i0} + \beta_{i1})PW_{it-1}$$

$$+ \lambda_i NFA_i$$

$$PR_{it} = \eta_i PR_{it-1} + \gamma_{i0} (PW_{it} - PW_{it-1}) + (\gamma_{i0} + \gamma_{i1}) PW_{it-1}$$

where

PF = farm price of rice (in milled rice equivalent), deflated

PW = wholesale price of rice, deflated

PR = retail price of rice, deflated

NFA = NFA intervention variable

i = indicates region

The farm price regression equation above states that farm price in a given region is a function of last period's farm price in the region, the change in the current period of the wholesale price in the region, last period's wholesale price in the region, and an NFA intervention variable. The intervention variable used is the ratio of NFA procurement to the annual regional rice output. Estimates were done using monthly data and quarterly data. When the quarterly data is used, the NFA intervention variable is the ratio of NFA procurement in the region during the quarter to the rice output of the region during the same quarter.

Similarly, the retail price regression equation above states that the retail price is a function of last period's retail price, changes in the wholesale price, and last period's wholesale price. As an initial hypothesis, no NFA intervention variable is included in the equation on the presumption that NFA intervenes through the wholesale market, which is already captured in the wholesale price of rice. In the actual estimation, the retail price regression was estimated without and, for the national level estimates, with NFA intervention variable (i.e., ratio of NFA distribution to total rice consumption). The rationale for the inclusion of an NFA intervention variable is that the agency also has retail segment,

albeit very small, that seems to be popular with the sitting Philippine president (their names tend to be emblazoned in this retail component of NFA). There are no quarterly or monthly regional rice consumption that the authors are aware of; hence, it is not possible to test the "with NFA" regressions.

The Ravallion regression equations for farm prices were estimated for the whole year and by season (i.e., main harvest season, dry season, and off season) given the pronounced seasonality of rice production and of farm prices. This suggests that the implicit assumption of constant marketing margins in the Ravallion model may not be met in using monthly data that do not consider the seasonality of rice production.

The Ravallion regression estimates can be used to determine whether or not there is market integration in the short run as well as to estimate the degree of market integration (see Umali, 1990, for an extended discussion). Short run full market integration between farm and wholesale markets, as strictly construed, means that the changes in the wholesale price during the current month are fully reflected in the farm price; that is:

$$\beta_{i0} = 1; \quad \beta_{i1} = 0; \quad \alpha_i = 0$$

Similarly, for the retail market and the wholesale market, short run full market integration requires:

$$\gamma_{i0} = 1; \gamma_{i1} = 0; \eta_i = 0$$

Short of full market integration, it is worth examining the degree of integration between markets; in effect, the relative importance of past local and reference prices and of policy variables. Timmer's Index of Market Connection (IMC), drawing from the values of the coefficients of the Ravallion regression estimates, provides a measure of the degree of market integration. The Index of Market Connection is determined as follows:

IMC =
$$\alpha_i / (\beta_{i0} + \beta_{i1})$$

The formula above is for the farm to wholesale market integration. A similar formula for the index of market connection between the retail and wholesale markets can be constructed. The correspondence between the degree of market integration and the value of IMC is as follows:

IMC	= 0		implies	$\alpha i = 0$	full integration b	etween farm and wholesale
					markets	
IMC	<	1		high marke	t integration betwee	n farm and wholesale markets
IMC	>	1		low market	integration betweer	n farm and wholesale markets
IMC	=	∞		implies β _{i0}	$= 0 = \beta_{i1}$	markets segmented

Table 8a and Table 8b present the farm –wholesale market integration results for the whole year using monthly data and quarterly data. **Table 9** presents the corresponding index of market connection for the farm-wholesale market integration results of **Tables 8a and 8b. Appendix Tables A.3.a** – **A.3.c** present the farm-wholesale market integration results using monthly data by production seasons. The production seasons are dry season (February to May), off season (June to September) and harvest season (October to January).

Virtually all the farm-wholesale market integration results using monthly data in **Table 8a** show that there is *weak market integration* between the farm level and the wholesale level in much of the country. In short, it is the past local farm prices that primarily determine the current farm prices. However, when quarterly data is used, the results in **Table 8b** show a completely different picture. Specifically, the quarterly results show that there is *strong market integration* in virtually all the regions except ARMM and marginally Eastern Visayas. The contrast between the monthly results and the quarterly results is best shown by the index of market concentration in **Table 9**: while the regression results using monthly data show IMC values of more than 1, and in a few cases at very high levels of more than 3, the regression results using quarterly data show IMC values very much lower than 1 with the exception of ARMM and marginally, Eastern Visayas (and the whole Philippines). In short, what the *Ravallion regression results suggest is that price adjustments at the farm level vis-à-vis the wholesale level takes more than one month, but largely within one quarter, to complete.*

Umali's (1990) Ravallion regressions used monthly data. Like the results in **Appendix Tables A.3.a-A.3.c**, Umali's results show weak farm-wholesale market integration in virtually all of the country. Umali did not have quarterly results; hence no comparison could be made with the paper's results. Nonetheless, it is likely that the conclusion of farm price adjustment taking longer than one month but largely finishing within a quarter was also prevailing during the 1970s and the 1980s. This is just a reflection of the still inadequate infrastructural facilities in the country. Indeed, as the country's rice granaries are moving further away from Manila to such regions as Cagayan Valley and the Cotabato basin, the demands of the rice marketing system on the country's infrastructure has become greater while at the same time that the quality of infrastructure in the more far flung areas of the country leaves much to be desired.

The Ravallion regressions involving the retail price of rice by region are shown in **Tables 10a and 10b and Appendix A.4.a – A.4.c.** Like in the case of farm prices using monthly data, the regression results show weak long run market integration between the wholesale markets and the retail markets in the various regions of the country. The results seem to suggest that it takes more than a month for prices to adjust fully to stimuli coming from the wholesale market.

Regression results and effectiveness of NFA intervention. The weak market integration between various market levels may not always be due to structural factors such as the quality of infrastructural facilities in the regions and between regions. It can also be due to government intervention in the rice marketing system. Indeed, a key point of market intervention of the government is to temper the price movements in the market to be more consistent with the price stability and food security objectives of the government.

The big question is whether indeed such weak market integration implied by the Ravallion regression results do arise because of government intervention. In the farm-wholesale market integration regressions, a government intervention variable is included. The intervention variable for the farm-wholesale regressions is either the ratio of NFA procurement in the region during the month to the annual output of rice of the given region (for the regressions with monthly data) or the ratio of NFA procurement in the region during the same quarter (for the regressions with quarterly data). The analytic framework for Ravallion regressions at the retail level is that no government intervention variable needs to be included because much of NFA intervention in

the rice market is done primarily at the wholesale level, which presumably means that the actual wholesale price of rice already incorporates the effect of NFA intervention.

The Ravallion regression results at the farm level regionally or nationally as well over the whole period or by season shown in **Tables 8a and 8b and Appendix Tables A.3.a** – **A.3.c** indicate that for the most part NFA intervention did not significantly influence farm prices especially. Where the NFA intervention variable is statistically significant, the sign of the coefficients was of the wrong, or more precisely, opposite of the presumptive impact of such NFA intervention on farm prices. *What the Ravallion regression estimates at the farm level indicates is that NFA domestic rice procurement was largely ineffective* in influencing the farm level prices regionally and nationally.

This finding is largely consistent with the finding of Umali (1990) that "...NFA paddy procurement continued to exhibit minimal influence on farm prices. Region 3 during the wet and off-season and Region 1 and 8 during the dry season displayed NFP coefficients that were statistically significantly different from 0 and negative. This may be due to the fact that although NFA made large purchases of paddy in these regions, the amount purchased was not sufficient to prevent farm prices from falling. Government intervention at the farm level was only effective in Region 6 during the dry season. Region 6 in the dry season showed a statistically significant and positive coefficient for NFP of 0.636" (p. 166).

Similar to the explanation of Umali, the negative relationship between NFA procurement and farm prices is indicative of the failure of the NFA intervention from preventing farm prices to fall.

The Umali dissertation is primarily on the (structure and) price performance of the Philippine rice marketing system, and only secondarily on the performance of Philippine rice price policy and NFA interventions. The Yao, Shively and Masters (2005) paper is specifically about the question of how successful the Philippine government is in its intervention in the country's rice market. As in the case of the Umali dissertation, the analysis relies on the estimation of price formation regressions that include government intervention variables. This paper also estimated the Yao, Shively and Masters (YSM) regressions with a slightly different time frame in order to further examine the impact of NFA interventions on the Philippine rice markets.

The YSM regression equation at the regional level is as follows (see Yao, Shively and Masters, 2005, p.5):

 $\Delta P_{it} = \alpha_i T_i + \beta_{it} NFA_i + \Sigma_{ijt} DM_{ijt} + \Sigma \theta_{iht} DY_{iht}$

where

ΔP	=	change in the monthly price of rice (farm or retail)				
т	=	unit step time trend				
NFA	=	NFA intervention variable, either the change in the NFA stock or change				
		in the NFA pur	chase or	change in sales	price	
DM	=	dummy for mo	nths			
DY	=	dummy for yea	r			
i	=	region; j	=	month; h	=	year

The YSM regression at the national level modifies the intervention variable and includes additional policy instruments (see Yao, Shively and Masters, 2005, p.5):

+

 $\Delta Pit = \alpha T + \beta NFA_{t} + \Sigma j DM_{jt} + \Sigma_{h} DY_{ht}$ $\gamma I_{t} + \eta \Delta R_{t} + \theta (I \times \Delta R)_{t}$

where

NFA	=	changes in aggregate stock or target price of NFA
I	=	binary number where 1 is for years with rice importation, 0 otherwise
ΔR	=	change in international price of rice (Bangkok f.o.b.)
Ix ΔR	=	interaction term

The regression results of Yao, Shively and Masters show that, at the national level, government intervention through changes in NFA stock and in the support price have statistically significant effect on the farm price at the national level, the first negatively and the other positively. The positive relationship between changes in the support price and the farm price is expected. The authors consider the negative relationship between the changes in NFA stock and the change in the farm price as reasonable in that NFA does much of its purchasing during the "peak harvest months" of September and October when the

farm price is low. Nonetheless, a stricter interpretation of the regression result is that an increase in the NFA rice stock (presumably through higher procurement) will reduce the farm price, which is contrary to expectations.

An alternative interpretation of the negative relationship in Yao, Shively and Masters is that the increase in the NFA stock of rice leads to lower farm price because the increase in stock was largely from imports, which suggests that there is poor timing in the arrival of imports such that the imports occur during the harvest season. This alternative interpretation appears to be more consistent with some view that, due to delays in the release of funds to NFA, actual importation is delayed to the point that part of the rice imports arrive during the harvest season thereby dampening the price of rice at the farm level.

The international variables in the Yao, Shively and Masters regressions are not statistically significant. The authors attribute this to the very small percentage that imports play in the domestic rice market. While feasible, this interpretation is not compelling because in an open economy, prices are determined at the margin which will be the import price. The more robust explanation for the statistical insignificance of the international trade variables is that the level of protection of the domestic rice is large, which in effect insulates the domestic rice market from the variations in the international rice market.

Thus, the most robust finding of the national level analysis of Yao, Shively and Masters is the positive impact of the government support price or purchase price of rice on the market farm price. However, as the authors point out, the impact on the farm price is very small, almost negligible. Moreover, the increase in the support price also increases the retail price. Thus, overall, the net welfare of the increase in support price is negligible indeed.

In their regional analysis, Yao, Shively and Masters indicate that NFA stock draw downs of rice was effective in lowering the retail rice prices in Regions 1, 4., 5, 9, and 12; that producer support price program benefited Regions 4,6, 10, 12 and 13; and that NFA rice stock increases (implying rice procurement) benefited Region 4. Thus the results of the regional analysis suggest that the impact of NFA intervention is mixed among the regions, with different regions benefiting from the various intervention measures, except for Region 4 which seems to be the most benefited of all. This varied impact on the regions may explain the muted impact of the NFA interventions at the national level.

This paper estimated the YSM regressions for both the farm price and the retail price, nationally and by region. In the regressions in the paper, however, the NFA intervention variable used is the level of NFA procurement or distribution in addition to the change in NFA stocks. This is because procurement or distribution is the more direct measure of NFA intervention, rather than the change in stock which can be due to imports also. Tables 11 and Appendix Tables A.5.a-A.5.d present the results. The national level results show that NFA distribution helped temper retail prices but that NFA procurement did not influence farm prices. The regional regressions show that only a few regions benefited from the interventions. Thus, on the rice procurement side, it is essentially Region 4 that benefited from it (using quarterly data) in terms of a resulting increase in the farm price while NFA procurement in Regions 6 and 13 did not prevent the fall in the farm price of rice (using quarterly data). On the retail and rice distribution side, only Regions 1 and 4 benefited from the NFA distribution through lower retail prices. The regression results suggest that NFA interventions (in terms of procurement or distribution) did not have statistically significant effect on the farm or retail prices of the other regions. The national level analysis also suggests that international prices did not have statistically significant impact on local prices, which is consistent with the historically high protection rate for rice and the apparently overriding price stabilization objective of the Philippine government, as was discussed earlier in the paper.

Like the results of the Yao, Shively and Masters paper, the results of the regressions indicate that the impact of NFA interventions is muted at the national level and that only a few regions benefited perceptively (in terms of statistically significant impact on local prices) from the NFA interventions. In contrast to the Yao, Shively and Masters paper, the results of the regressions in the paper suggest that, at the national level, it is in the retail and consumer side that NFA interventions have had an effect rather than at the procurement and production side. This is probably more consistent with the revealed bias of the Philippine government towards domestic (nominal) rice price stability in the face of volatility in the international rice prices to the point that the ex post high nominal rate of protection in the early 1990s was totally eroded by the mid 2000s.

In summary, the regression results in Umali (1990), Yao, Shively and Masters (2005) and this paper point out that NFA interventions have not been overwhelmingly successful. At best, the impact was small; it was also mixed across regions. Indeed, for many regions, NFA interventions did not have statistically significant impact on their farm or retail prices.

A further look at rice prices and NFA interventions. It may be useful to look at the issue of the impact of NFA interventions on rice prices beyond regression results. One approach is to juxtapose the ratio of the farm price in a region to the national average farm price with the ratio of NFA procurement of rice to the region's rice output. This juxtaposition is shown in the series of regional graphs in **Figure 13**. The presumption here is that the farm price of a region would be higher than the national average farm price if NFA procures more of the region's output (i.e., NFA rice procurement in the region as a ratio of the region's rice output is high).A corollary to the previous statement is that the ratio of the region's farm price to the national average farm price increases as the ratio of NFA rice procurement in the region is the region to the total regional rice output increases.

The series of graphs in **Figure 13** use annual data to make the patterns crisper and clearer. (Graphs involving monthly data were also prepared.) As the graphs suggest, there appears no correlation between the ratio of farm price to the national average farm price and the ratio of NFA procurement to the region's rice output. In a number of cases, the relationship even appears perverse; that is, the farm price ratio declines as the NFA procurement ratio rises or that the farm price ratio increases as the NFA procurement ratio declines. Examples of such perverse relationship are Eastern Visayas and Western Visayas during 1998-2002 as well as Southern Tagalog and the Zamboanga Peninsula during 1999-2002. There are also examples where variations in the NFA procurement ratio have no bearing on the ratio of the regional farm price to the national average farm price; e.g., ARMM. In short, the series of graphs in **Figure 13** suggest that NF**A** procurement has been largely ineffective in influencing the regional farm price relative to the national average price.

What can explain for the failure of NFA procurement to impact on the farm price? A likely reason is the value of the percentage on the right hand of the graphs. As the graphs show, the ratio of NFA procurement to the regional output is very small, almost negligible in some cases. The highest ratio is at Region 4 with more than 10 percent in some years, followed by Regions 5, 3, 12 and ARMM at more than 5 percent in some years. In some cases, the procurement ratio is a miniscule less than 1 percent (Eastern and Central Visayas). Thus, the NFA is a very small and (given the volatility in the procurement ratio) inconsistent player in the rice purchasing business. Even if a substantial portion of the regional output is effectively not traded and is for the own consumption of the farmers themselves, the numbers

nonetheless point out to an NFA that buys so small a share of regional (tradable) output to be able to effectively determine local prices instead of the local rice traders. Given the numbers, it is more the local traders that determine local prices at the farm level.

Figure 14 is a series of graphs that relate the ratio of regional retail and wholesale prices to the average national retail or wholesale prices with the regional distribution bias of NFA distribution of rice. The NFA distribution bias is measured by the share of a region to the total NFA distribution of rice as a ratio of the region's share if all regions have equal share of NFA distribution. Regions with NFA distribution bias measure much greater than 1 are the regions that are given priority by NFA in its distribution strategy of rice. Not surprisingly, Manila has a particularly high measure of NFA distribution bias. The other regions where NFA appears to give particular emphasis in its rice distribution are Southern Luzon (Calabarzon and Mimaropa), Central Luzon (at times), Bicol (at times) and Central Visayas (at times). Suplus regions like Cagayan Valley and Socksargen are expectedly given less emphasis by NFA. Interestingly, much of Mindanao is given less priority by NFA in its distribution of rice. The reasons can be because Mindanao is relatively self-sufficient (although some provinces have low self-sufficiency ratios) and in part due to the relatively lower population density of the Mindanao regions as compared to the more industrialized National Urban Beltway area (Central Luzon, Metro Manila and Calabarzon).

In the series of graphs in **Figure 14**, it is apparent that in some regions there is some negative relationship between the NFA distribution bias and the ratio of the regional retail or wholesale price to the national average price, at least in some years during the period. Specifically, the regional price ratio tends to be lower when the NFA distribution bias increases. This is apparent for Regions 1, 4B, 5, 6, 7 and 8. The case of Metro Manila appears to be more reactive behavior for NFA in the sense that when the Manila retail or wholesale price rises significantly relative to the national average, NFA becomes more focused on Metro Manila by raising its distribution bias towards Metro Manila. This apparent reactive behavior is consistent with the bias by the government for rice price stability, especially in such a politically important region like Manila. The results in **Figure 14** seem to corroborate the apparent greater focus of NFA towards the rice consumer during the latter 1990s and the 2000s, as was discussed earlier in the paper.

Summary and an apparent puzzle. In summary, the regression results of Umali (1990), Yao, Shively, and Masters (2005) and this paper indicate that NFA interventions in the rice market, primarily

through the domestic purchase of (rough) rice and distribution of milled rice sourced domestically and abroad has not been a resounding success in affecting the price of rice at the farm level and at the retail level. Indeed, the findings are that the impact had been very small if at all. The graphical juxtapositions also suggest that NFA procurement relative to the regional rice output has been largely ineffective in influencing the price of rice at the farm level.

However, this apparent small, even negligible, impact of NFA intervention in the rice market (as drawn from the regression results) flies in the face of the apparent success of the Philippines in maintaining a relatively stable price of rice domestically as compared to the more volatile international price during the 1990s and the 2000s, at least up until recently. The apparent success of the country in maintaining a relatively more stable rice price has been done primarily through NFA. Similarly, the graphical juxtaposition of the relative regional retail prices with NFA distribution bias suggests that NFA regional distribution bias affects the relative regional retail price in some regions of the country, and that to some extent, there appears to be some bias for relative price parity (in the sense that sharp rises in the relative regional prices are addressed through the corresponding increase in the regional bias in NFA's rice distribution). This is consistent with the apparent overriding bias of NFA and the government for rice price stability and parity all over the country.

Thus, the big question and a puzzle arises: how can NFA which seems to have been largely ineffective in its rice purchase and distribution functions be largely effective in ensuring relatively greater rice price stability (in nominal terms) in the domestic market than the international market during the 1990s and the 2000s?

The answer is likely because of NFAs use of its dominant power to import rice. Specifically, it appears that the volume of NFA rice imports had been largely consistent with the natural growth of demand based on population growth and income growth taking into consideration the domestic output. In effect, the implicit bias is to import, in the face of the projected demand and domestic output, just enough to maintain domestic prices. In effect, NFAs import decisions determine the overall rice price in the country. At the same time, because the share of imports to total output is small and its domestic purchase increasingly miniscule, NFA has not had significant impact on local rice prices as against the private rice traders.

However, if the above analysis of the apparent NFA puzzle is correct, that is , that it is primarily the international trade "monopoly" of NFA that mattered in affecting overall relative rice price stability in the country, then **the current NFA is potentially redundant**! *This is because the same result can be gotten through the use of flexible or variable tariff but relying on the private sector traders to do the importing or exporting.* This approach does not cost much; in fact, the approach could earn income for the government as long as the government is willing to follow the long term trend of the world rice price as the basis for the long term price in the domestic market, with appropriate adjustment for tariffs and exchange rate changes. In view of the nearly zero nominal rate of protection in recent years and given the pressures for tariff reduction of commodities in regional trade agreements, the country will have little choice but to follow the long term trend of the world price of rice for its domestic price unless the government is willing to provide substantial subsidy to rice farmers and rice consumers. It is likely that this approach of relying on the private sector for international trading and on the use of a variable tariff to temper the domestic effect of changes in the world rice price could generate significant cost savings for the government than the current approach under NFA.

The Cost of NFA: Too Much for So Little?

The National Food Authority is a substantial component of the national budget for the agriculture sector as well as of the whole government corporate sector. For example, for the period 1998-2005, the direct subsidy to NFA (and excluding contingent liabilities from NFA's borrowings) averaged about Php 4.5 billion per year. This is equivalent to 37.4 percent of the average annual expenditures of the Department of Agriculture under the Office of the Secretary (where virtually all the major production programs of the Department including those of the regions are lodged). The average annual subsidy to NFA during the period is also equivalent to 186 per cent of the average annual expenditures of ALL the attached agencies of the Department of Agriculture. The national fiscal transfers to the NFA during the 1998-2005 dwarfed the total fiscal transfers of ALL of the other government corporations under the Department of Agriculture, including the National Irrigation Administration, Philippine Coconut Authority, National Crop Insurance Corporation, and the Philippine Rice Research Institute. In short, the National Food Authority has loomed large in the overall budget for the agricultural sector in the country. This large role of NFA in the agricultural budget was even heightened during the past three years when the government subsidy of the NFA increased much further as the government attempted to temper domestic rice prices in the face of sharply rising world rice prices during 2007-2008.

Table 12 shows the profit and loss statement of NFA; **Table 13** shows NFA's balance sheet and **Table 14** presents the sources and uses of funds of NFA. The three tables are all interrelated. As the profit and loss statement shows, NFA has been largely losing in its operations, thereby requiring subsidies from the national government to survive. The balance sheet data in **Table 13** shows an essentially bankrupt corporation, with a negative net worth. As such, the only way that NFA could borrow funds if such borrowings are guaranteed by the national government. It is probably not surprising that the borrowings of NFA are virtually domestic credits as it is more difficult and costly for a bankrupt corporation to borrow internationally.

The large fiscal cost of NFA stems from both policy imperatives and operational inefficiency. The policy imperatives are intimately linked to the price stabilization objectives of the government. Specifically, one key policy mandate is to "buy high and sell low". The mandate of "buy high" is obviously geared for domestic purchases of rice although NFA has relied a lot on imports to beef up its rice stock. Up until the early 1990s when the nominal rate of protection of rice was high, the reliance on imports could be a mechanism for NFA to generate internal funds by "buying low" from a foreign country and "sell high" in the domestic market. However, as the nominal rate of protection dropped sharply with the sharp rise in the world price of rice in the 2006-2008 precisely, maintaining the domestic price of rice necessitated large fiscal subsidies by the national government. Thus, not surprisingly, the deficits of NFA in recent years were huge. During the 2000-2005 period, NFA's deficit accounted for 31 percent in 2002 and 43 percent in 2005 of the total deficit of all the (monitored) government corporations (World Bank, 2007, Table 10, p. 14).

The other major reason for the fiscal cost of NFA is operational inefficiency. The Coffrey International Development Report "Review of the National Food Authority's Operational Efficiency and Effectiveness" (March 2007) lays out many of the important operational issues that virtually assure that NFA operations are substantially higher than the competing private sector. Drawing from the Report, the following are note worthy:

- 1. NFA's stock turnover is only 4 times a year as compared to about 21 times a year for the private sector. This means, other things being equal, higher inventory financing and storage costs and higher rate of deterioration of stock which adds up to higher overall inventory unit costs compared to the private sector.
- 2. Poor financial management information system, lack of integrated logistics-related information system and out of date/inadequate computer facilities have led to ineffective monitoring of stocks and operations, serious backlogs in reconciliations of financial and inventory statements, inadequate use of financial statements pro-actively for management decisions, and to overall loose controls, both financial and physical. The result is wastage and lower operational efficiency.
- Overstaffing and government bureaucratic rules prevent a more flexible deployment of staff consistent with the ebb and flow of rice trading in various parts of the country. The result is higher administrative costs than necessary.
- 4. Policy constraints (e.g., forward contracts not feasible) and bureaucratic processes (e..g, emphasis on IAC recommendations on volume of imports) leads to tight importing window for NFA and generally higher rice contract prices than the world price, even adjusted for freight cost.
- 5. The corporation has a weak equity base. As a result, it relies a lot on borrowings to finance a significant part of its operations. This means a growing interest cost as a drag to its overall financial performance.

The Report brings out other operational and organizational issues facing NFA; e.g., NFA's management structure and corporate governance leave much to be desired.

The upshot of the discussion above is that given the policy constraints (e.g. pricing, import procurement), organizational and governance inadequacies, and operational weaknesses, it is not surprising that the National Food Authority is a major money losing government corporation.

It must be noted that the experience of the National Food Authority is not unusual among public instrumentalities tasked to undertake price stabilization functions of basic commodities in developing countries. Even one of the more successful NFA-type institutions in the developing world, BULOG (Badan Ulrusan Logistic Nasional or National Food Logistics Agency) of Indonesia, had to rely at some point on substantial implicit subsidies from the government through subsidized interest rates on its outstanding credits with Bank of Indonesia (Indonesia's Central Bank) then later the Bank Rakyat Indonesia as well as relatively higher price paid for BULOG's rice delivered to the government's military and civil servants. The BULOG experience also shows that it is not easy to manage transitory surpluses and deficits in the face of weather-related production shocks as well as global price shocks. (See DAI, 2002.) And in the early 2000s, the agency was rocked with a series of financial scandals called Bulogate I, Bulogate II and Bulogate III, in part linked to Bulog's finances being partly used for election purposes (Guerin, 2003).

Are NFA's losses and the government subsidies worth it? Given the results of the previous sections that indicate that NFA's domestic rice purchasing and distribution interventions have not been effective in influencing farm prices and only mildly effective in influencing consumer prices at best, it can be concluded that the cost of NFA has been too much for so little benefit.

If NFA as it is now is expensive and ineffective, what is the way forward?

The Way Forward and Policy Implications

There are essentially two alternative options to undertake price stabilization for basic commodities; to wit:

- 1. Rely primarily on a government instrumentality like an NFA but managed better as well as given more operational leeway than the current NFA; and
- 2. Rely more on the private sector to undertake the rice trading and use variable tariffs or explicit subsidies to influence private sector behavior consistent with the government's price stabilization objectives

For the first option, given that NFA is virtually bankrupt, the current approach to government intervention relying on NFA as it is currently operated does not appear to be viable and sustainable simply because the agency cannot continue to finance operational losses from continued borrowing with an ever increasing interest and debt payment (Coffrey International Development Report , 2007). Thus, if the government were to continue to pursue Option 1 as its primary means of stabilizing rice prices, then NFA has to be recapitalized at the same time that substantial policy and bureaucratic
changes in the national government and operational improvements at NFA have to be made. *These* changes and improvements are spelled out in the Coffrey International Development Report (2007).

The experiences and lessons from BULOG are also relevant for the revitalized NFA in this regard. Specifically, BULOG explicitly compared the cost of price stabilization with the benefits from price stabilization, as a significant factor determining their operational strategy. An important by - product of this mindset is the pursuit of "self-sufficiency on trend" instead of every year as a means of reducing cost to BULOG. This means that international trade is used to minimize storage costs for BULOG. BULOG also ensured that the marketing margins were wide enough to make it profitable for the private sector. This suggests that the government views the private sector as central to the rice marketing system, such that price distortions have to be minimized as much as possible. (See DAI, 2002.)

With respect to Option 2, given that NFA is virtually bankrupt, it is also unrealistic to expect that NFA can be operated as if it were a private corporation unless there is a massive infusion of equity into a new and revitalized NFA. However, it is not at all clear and compelling that indeed a massive equity infusion into NFA is enough to make it competitive with the private sector in the rice trading business, unless it is allowed to operate as a private corporation altogether. If NFA were to operate as a private firm however, it can be argued why not just rely on the private sector in the first place to do the rice trading but with clear regulatory regime and price stabilization intervention approaches? Unless, of course, there are indications that there is a possibility of collusion among private sector traders, in which case the government's agency provides competitive pressure to the private sector.

As discussed earlier in the paper, there are three nuances of price stabilization; i.e. a more stable domestic price relative to the world price, lower seasonal price variability, and prevention of sharp price spikes and fast resumption of supply chain after a calamity strikes an area. Of the three, the prevention of sharp price spikes and fast resumption of the supply chain during a calamity or disaster is the most compelling reason for government intervention in the rice market. More stable domestic prices relative to the global crises remain an important political imperative for the Philippines. The least compelling reason for government intervention in the rice marketing industry is to reduce seasonal price variability, in part because there is yet no compelling evidence of either a rice trading monopoly or a rice trading monopsony in the country.

A cursory look at rice trading in Asia indicates that rice trading is left to the private sector in capitalist countries that are net exporters (e.g., Thailand) or in high income countries where the share of rice in total family expenses is miniscule (e.g., Singapore, Japan, Korea, Hong Kong). (Countries like rice exporting Vietnam or Myanmar are best viewed as transitional economies in this regard, as government corporations play a significant role in the rice trading sector as well as in many sectors of the economy.) Indonesia and the Philippines are the two major developing East Asian countries that are net rice importers (although Indonesia has been a marginal exporter at times in recent years) and which have a large population of rice consumers and rice farmers. So far, the high political salience of rice has meant that the governments had to have a government entity (i.e., either NFA or BULOG) that has to be engaged in rice trading, both as a seller and as a buyer. A key reason behind this is the deep concern about the thinness of the global rice market and the volatility of world rice prices, which can bring unwanted rise in the volatility of domestic rice prices and the possible attendant spill - over effects on wages and other sectors of the economy as well as on the political stability of the country.

It may be noted that historically the Philippines and Indonesia have been the two biggest rice importers in the world, so much so that their buying behavior affects world rice prices. (The latest example was the buying spree of the Philippines –the world's largest importer at present--in early 2008 that led to some extent to the skyrocketing of world rice prices at that time.) It must also be noted though that neither NFA nor BULOG have been very successful in this regard: in either case, there were instances when the agency got caught flatfooted with unexpected shocks in the international rice market as well as in the domestic market.

In view of the deep concern about the global rice market and the overriding emphasis on price stability domestically, a key issue is how can a purely private rice trading system ensure domestic price stability as well as reliability of supply for a primarily rice importing country like the Philippines? In principle, domestic price stabilization vis a vis global price variability can be done in a straightforward manner through a variable tariff system, wherein the tariff is reduced when the world price increases beyond a target price and the tariff is increased if the world price of rice decreases to a level below a target price. What is needed here is that the process of tariff rate changes for rice imports has to be less bureaucratic than it is now (with public hearings, etc.) and that it can be done anytime when it is needed, unlike today that the tariff changes need to be done through Congress unless the legislature is in recess, in which case the President can issue the tariff change executive order. This will clearly require a law that

exempts the changes in the tariff rates of rice from the current strictures on rate setting; in effect, Congress cedes its inherent power to set the tariffs on rice imports.

The private sector can likely provide supply reliability if there is much greater policy certainty of its involvement in the international rice trade. Indeed, the private sector needs to be allowed to import (or export as the case may be) as is warranted in order to address domestic supply and demand mismatches as well as to manage rice inventory and thereby reduce cost. Unlike NFA that cannot undertake long term contracts with exporters, the private sector can, which would likely lead to greater certainty in supply of rice. The greater policy certainty allowing the private sector to trade internationally in rice could encourage private investments in logistic facilities as well as business relationships domestically and internationally. In this respect, international rice trading need not be much different from the importation (and domestic trade) of, say, wheat flour and yellow corn which are currently all handled by the private sector in the country.

The country's emergency rice reserves can be handled by (an appropriately scaled down) NFA or even by the private sector for the government. The emergency rice reserves can be expected to be primarily for the poor and near poor who would be particularly hard hit by price hikes in case of calamities. Thus, the rice stock can likely be of lower quality (i.e., higher brokens) which fetches lower price internationally. Although the private sector can manage the storage function for the government for the emergency reserves, it is likely that a scaled down NFA would have greater political salience because it still signals the government can have control over the strategic reserves especially in cases of emergency or calamity. Moreover, national and local agencies and officials are involved in the distribution of rice reserves during emergencies; hence it may be more expeditious to have the reserves under the control of a government instrumentality like a scaled down NFA.

Because rice stocks deteriorate over time unless there is high turnover, the scaled down NFA may need to have also a very limited market presence in the low quality market in the more depressed areas of the country to allow it to have a turnover of its rice stocks.

In summary, what seems to be the most sensible course of action is to trim down NFA's focus towards primarily the management of the strategic reserves, monitoring of the global rice market that will help

the government decide on the appropriate tariff on rice imports, and monitoring or regulating the private sector to prevent collusion and monopoly at the local level.

The trimmed down NFA has one significant impact, which is the reduction in the budget spent by the government on NFA subsidies. The amount that is released can be used more productively for more productivity enhancing agricultural functions like agricultural research and development, irrigation investments and improvement of facilities to monitor implementation of standards by the private sector. Studies have shown that the returns from agricultural research and development are particularly high, yet the Philippines lags behind competitor countries like Thailand and Malaysia and China in terms of the overall investment in agricultural research and development. Moreover, much of the R & D funding has been in rice, which is not quite surprising given the high political salience of rice in the country. Nonetheless, the country has large potentials in other agricultural crops and even fisheries, e.g., tropical fruits, mariculture. However, research and extension funding has been low and inadequate and the quality of support R & D institutions leaves much to be desired especially because other countries in the region have been investing a lot more than the Philippines for so long.

In short, playing catch up with the rest of the countries in the region would require substantial amount to build the human and physical capacity to undertake research, development and extension effectively. In the light of the tight budgetary constraint facing the Philippines, it is the realignment of funds from the hitherto large subsidies of the National Food Authority that will provide the significant leeway for the needed substantial increase in investments in agricultural R & D as well as other productivity enhancing investments in the sector (including farmer education, demonstration farms, and farm to market roads).

The above mentioned way forward of a trimmed down NFA to handle emergency reserves, much greater reliance on the private sector in tandem with a variable tariff system to handle overall domestic rice price stabilization, and the reallocation of much of the subsidies to NFA toward productivity enhancing investments like agricultural research, development and extension would likely result to a more sustainable macro-level self-sufficiency in the country. This is because the proposed way forward addresses the two critical elements of macro level self-sufficiency; i.e., relative price stability of the major food grain and the higher earning potentials of farmers who are among the poorest in the country.

REFERENCES

- Coffrey International Development (2007). Philippines: PEGR Reform Agenda R003-A-01. *Review of the National Food Authority's Operational Efficiency and Effectiveness*. Final Report, March 2007.
- DAI Food Policy Advisory Team (2002). Food Security in an Era of Decentralization:
 Historical Lessons and Policy Implications for Indonesia. Working Paper No. 7. Indonesian
 Food Policy Program, February. Accessed. <u>http://pdf.usaid.gov/pdf_docs/PNADE883.pdf</u>

David, C. (1997). *Food Policy: Its Role in Price Stability and Food Security*.Discussion Paper Series 97-11. Philippine Institute for Development Studies, May.

- Guerin, B. (2003) "Indonesia's Bulog Rises Again". Asia Times Online, August 23. <u>Http://www.atimes.com/atimes/Southeast_Asia/EH23Ae04.html</u>
- Islam, N. and S. Thomas (1996). Food Price Stabilization in Developing Countries: Issues and Experiences in Asia. Food Policy Review No. 3. Washington D.C., International Food Policy Research Institute,
- Umali, D. (1990). *The Structure and Price Performance of the Philippine Rice Marketing System*. Ph.D. dissertation. Stanford University.
- World Bank (2007). *Philippines: Agriculture Public Expenditure Review*. Technical working paper of the Rural development, natural resources and environment sector unit of the East Asia and Pacific Region of the World Bank, June.
- Yao, R., Shively, G. and Masters, W. (2005). *"How successful are government interventions in food markets: insights from the Philippine rice market"*. Staff Paper 05-06.
 Lafayette: Department of Agricultural Economics, Purdue University, May.

Veen	Farm Gate	Wholesale	Retail
rear	Price	Price	Price
1990	16.24	19.53	21.02
1991	13.69	16.94	18.60
1992	12.74	16.29	17.87
1993	13.38	17.36	19.08
1994	13.23	17.68	19.37
1995	15.22	20.55	22.30
1996	15.89	22.10	24.14
1997	14.66	20.31	22.32
1998	14.06	19.16	20.96
1999	12.59	18.15	19.92
2000	12.95	17.77	19.45
2001	11.77	16.49	18.19
2002	12.34	16.55	18.16
2003	11.95	16.08	17.75
2004	12.06	15.85	17.45
2005	12.36	16.12	17.63
2006	11.67	15.51	17.08
2007	12.17	15.93	17.43
2008	14.08	19.23	21.10

Table 1: Rice Prices in the Philippines, (in constant 1994 prices)

Table 2. Rice: International Price and Philippine Wholesale Price

	(a)	(b)	(a*b*1.2)	
			Bangkok 35%in	
	Bangkok	PHP/USD	PHP - Adjusted	Philippine
Year	fob 35%	Exchange	for Transport	wholesale
	in USD	Rate	and Handling	Price
			Costs	
1990	201.98	28.00	5883.14	19,555.00
1991	223.80	26.67	7381.12	16,973.00
1992	217.20	25.32	6652.96	16,274.00
1993	192.12	27.79	6258.66	17,340.00
1994	219.06	24.15	6932.42	17,664.00
1995	290.63	26.21	8975.91	20,441.00
1996	275.63	26.29	8670.41	22,099.00
1997	246.65	37.17	8644.81	20,320.00
1998	250.22	39.07	12292.84	19,190.00
1999	210.17	40.62	9845.95	18,154.00
2000	167.02	49.90	8812.44	17,777.00
2001	149.01	51.79	9122.93	16,492.00
2002	170.73	53.52	10572.07	16,554.00
2003	178.13	55.45	11586.22	16,085.00
2004	223.17	56.18	15010.28	15,856.00
2005	262.08	53.61	17323.34	16,120.00
2006	272.25	49.47	16765.77	15,507.00
2007	300.25	41.74	16583.12	15,933.00
Sep-2008	635.00	48.09	35579.46	19,193.00

Year	Farmgate	Wholesale	Retail	Average
1990	0.76	0.55	0.36	0.56
1991	1.04	0.85	0.72	0.87
1992	0.76	0.78	0.78	0.77
1993	0.66	0.92	0.93	0.84
1994	0.56	0.57	0.48	0.54
1995	1.54	2.81	3.28	2.54
1996	1.94	1.16	0.90	1.33
1997	0.84	0.48	0.41	0.58
1998	1.07	0.35	0.33	0.58
1999	0.87	0.43	0.35	0.55
2000	0.87	0.43	0.35	0.55
2001	0.49	0.25	0.21	0.32
2002	0.75	0.46	0.51	0.57
2003	0.64	0.37	0.28	0.43
2004	0.80	0.45	0.35	0.54
2005	0.92	0.57	0.43	0.64
2006	0.70	0.25	0.15	0.36
2007	0.58	0.34	0.34	0.42
2008	2.15	2.13	2.25	2.17

Table 3a: Standard Deviation of Philippine Deflated Rice Prices, by Year

Table 3b: Standard Deviation of Deflated Rice Prices for the Whole Period, 1990-2008, by Region

Dogion	Farm Gate	Wholesale	Retail
Region	Price	Price	Price
Philippines	1.70	2.06	2.20
NCR	NA	2.29	2.42
CAR	2.17	2.25	2.30
1	2.19	2.29	2.33
2	2.02	2.11	2.24
3	2.01	2.28	2.43
4-A	2.09	2.84	3.04
4-B	2.14	2.32	2.47
5	1.86	2.25	2.66
6	2.01	2.16	2.21
7	1.67	2.38	2.83
8	1.71	2.15	2.19
9	1.65	1.94	2.03
10	1.51	1.98	2.04
11	1.56	1.92	2.02
12	1.91	2.10	1.93
13	1.50	1.70	1.78
ARMM	1.75	2.38	2.31

Region	Whole Period	1995	2000	2004	2008
CAR	0.72	0.96	0.62	-0.78	0.92
1	0.92	0.96	0.83	0.27	0.95
2	0.95	0.96	0.56	0.22	0.96
3	0.92	0.95	0.92	0.80	0.95
4-A	0.95	0.86	0.79	0.78	0.98
4-B	0.97	0.94	0.85	0.45	0.93
5	0.93	0.94	0.14	0.29	0.96
6	0.95	0.89	0.53	0.69	0.97
7	0.99	0.97	0.87	0.11	0.96
8	0.75	0.95	0.92	0.22	0.96
9	0.90	0.95	0.83	0.07	0.75
10	0.95	0.96	0.83	0.35	0.78
11	0.90	0.96	0.74	0.28	0.96
12	0.83	0.93	0.74	0.49	0.92
13	0.91	0.86	0.72	0.31	0.94
ARMM	0.88	0.93	0.79	0.38	0.92

 Table 4: Correlation
 Coefficients of Regional Wholesale Price with Manila Wholesale Price

Note: The years 1995, 2000, 2004 and 2008 are indicative of the estimates, which were done on a yearly basis.

Dogion	Short	Long
Region	Run	Run
CAR	0.26	0.99
1	0.27	1.1
2	0.31	0.96
3	0.41	1.04
4-A	0.29	1.22
4- B	0.35	1.02
5	0.36	1.01
6	0.21	0.86
7	0.34	0.99
8	0.33	0.94
9	0.16	0.78
10	0.30	0.81
11	0.20	0.74
12	0.17	0.77
13	0.21	0.72
ARMM	0.25	1.07

 Table 5: Short Run and Long Run Elasticity of Regional Wholesale

 Prices with Manila Wholesale Price

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2

	I able	o: Standar	u Deviation	1 of Paddy	Rice Price,	, in Selecte	u Regions	
Dogion		Farm Gate		Who	lesale		Retail	
Region	1957-1963	1974-1986	1990-2008	1974-1986	1990-2008	1952-1963	1974-1986	1990-2008
1	5.21	3.36	2.19	4.29	2.29	4.57	3.46	2.33
3	6.47	4.10	2.01	3.26	2.28		1.43	2.43
4-A	5.78	3.29	2.09	7.69	2.84	4.31	4.34	3.04
4-B			2.14		2.32			2.47
6	7.50	7.04	2.01	5.28	2.16	3.78	3.26	2.21
8	4.48	2.99	1.71	3.12	2.15	2.16	2.20	2.19
10		2.09	1.51	2.31	1.98		2.31	2.04
11	3.12	4.18 ^a	1.56	2.10 ^a	1.92	2.69	1.07 ^a	2.02
12	5.53	3.43	1.91	4.04	2.10	2.89	2.78	1.93
		^a 1978-8	6					

Table 6: Standard Deviation of Paddy Rice Price, in Selected Regions

Source: Umali, (1990), Table 5.1 p.195

Notes:

The Mindanao regions are somewhat different from the earlier periods with the addition of CARAGA. CARAGA's standard deviations are even lower than those of the other Mindanao regions.

Table 7: Ratio of farm price to wholesale price (in milled rice terms), selected countries

	Bangladesh	India	Indonesia	Philippines	Thailand
1985	0.73	0.71	0.71	0.80	0.76
1986	0.75	0.74	0.57	0.75	1.06
1987	0.72	0.81	0.56	0.84	1.15
1988	0.72	0.77	0.73	0.78	0.94
1989	0.74	0.67	0.75	0.94	0.77
1990	0.76	0.71	0.77	0.84	0.85
1991	0.76	1.03	0.81	0.77	0.83
1992	0.88	1.02	0.73	0.76	0.80
1993	0.76	0.99	0.70	0.76	1.08
1994	0.67	0.95	0.71	0.71	0.99
1995	0.75	1.06	0.69	0.75	0.98
1996	0.66	1.05	0.70	0.72	1.11
1997	0.54	0.79	0.72	0.72	0.84
1998	0.57	0.77	0.56	0.72	0.60
1999	0.62	0.96	0.66	0.69	0.98
2000	0.59	1.00	0.68	0.73	0.99
2001	0.57	0.95	0.68	0.71	0.97
2002	0.62	-	0.63	0.75	0.95
2003	0.54	-	0.58	0.74	1.01
2004	0.75	-	0.73	0.74	0.93

1 4010 041 144	, amon i	11051 0001		onenny i			, usej	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fphil^	freg1	freg2	freg3	freg4a	freg4b	freg5^	freg6
Farm price, previous pd.	0.780^{***}	0.539***	0.709***	0.659***	0.636***	0.495***	0.554***	0.656***
	(0.0753)	(0.0896)	(0.0607)	(0.0688)	(0.0915)	(0.0920)	(0.0702)	(0.117)
Wholesale price, previous pd.	0.0637	0.211*	0.113	0.0845	0.150	0.262***	0.216***	0.117
	(0.0746)	(0.0954)	(0.0664)	(0.0708)	(0.0816)	(0.0584)	(0.0619)	(0.122)
Change in wholesale price	0.607^{***}	1.003***	0.663***	0.736***	0.291	0.950***	0.887^{***}	0.853***
	(0.170)	(0.171)	(0.105)	(0.172)	(0.209)	(0.102)	(0.145)	(0.179)
Ratio of Procurement and Prod'n	-7.065	-50.28*	-26.91	-16.88	-18.23*	-15.48*	-17.14	-31.82
	(15.75)	(20.69)	(19.74)	(17.36)	(7.285)	(6.999)	(15.43)	(35.76)
dum9596	0.386	0.950**	0.564	0.799^{*}	0.360	0.745**	0.432	0.648**
	(0.210)	(0.296)	(0.290)	(0.318)	(0.356)	(0.279)	(0.259)	(0.219)
dum9799	0.136	0.238	0.263	0.265	0.0752	0.269	0.0984	0.289
	(0.158)	(0.244)	(0.213)	(0.245)	(0.257)	(0.245)	(0.185)	(0.154)
cons	1.682**	2.818^{*}	1.933*	3.116**	2.020^{*}	1.823*	1.485	2.382***
	(0.590)	(1.172)	(0.842)	(1.058)	(0.860)	(0.780)	(0.756)	(0.706)
N	156	156	156	156	156	156	156	156
adj. R^2			0.859		0.840			0.903
Durbin's alternative test for autoco	orrelation							
chi2			1.682		2.957			3.601
Prob > chi2			0.1946		0.0855			0.0578

Table 8a: Ravallion	Regressions:	Monthly H	Farm Price ((Robust)

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	freg7	freg8^	freg9	freg10	freg11	freg12^	freg13	farmm
Farm price, previous pd.	0.624***	0.403*	0.526***	0.617***	0.503***	0.620***	0.503***	0.534***
	(0.0829)	(0.161)	(0.0800)	(0.0808)	(0.135)	(0.0875)	(0.103)	(0.0764)
		**	**					***
Wholesale price, previous pd.	0.0415	0.338**	0.265**	0.173*	0.302*	0.193*	0.284*	0.253***
	(0.0550)	(0.108)	(0.0979)	(0.0767)	(0.132)	(0.0926)	(0.110)	(0.0725)
	***	***	***	***	***		***	
Change in wholesale price	0.370	0.570	0.874	0.685	0.707	0.817	0.894	0.179
	(0.0997)	(0.147)	(0.177)	(0.142)	(0.0990)	(0.0786)	(0.155)	(0.132)
	150 1	1010			- 001		100 1***	10.40
Ratio of Procurement and Prod'n	-4/8.4	-184.9	-111.9	-45.77	7.801	-17.32	-1859.1	-18.48
	(294.3)	(101.0)	(37.45)	(33.46)	(13.27)	(9.506)	(444.8)	(9.378)
dum0506	0 424	0.145	0.0716	0.140	0 222	0.502**	0.262	0 627
dum9596	0.424	0.145	-0.0/16	0.149	0.332	0.592	0.363	-0.637
	(0.333)	(0.314)	(0.340)	(0.214)	(0.244)	(0.202)	(0.296)	(0.358)
dum0700	0.0751	0.181	0.0867	0.115	0.152	0.376**	0.123	0 3 3 0
dum9799	(0.224)	(0.285)	(0.255)	(0.102)	(0.152)	(0.140)	(0.203)	(0.263)
	(0.224)	(0.285)	(0.233)	(0.192)	(0.105)	(0.140)	(0.203)	(0.203)
cons	4 221***	1 190	1 385	1.747^{*}	0.870	1 814**	1 232	1 448
	(1.071)	(1.039)	(1.160)	(0.844)	(0.784)	(0.568)	(0.982)	(0.863)
N	156	156	156	156	156	156	156	156
adi R^2	0 595	120	0 755	0.808	0.832	150	0.806	0.606
Durbin's alternative test for autoco	rrelation		0.755	0.000	0.052		0.000	0.000
chi?	0 202		0 338	0.008	0.017		1 817	0.290
Proh > chi2	0.6534		0.5612	0.0281	0.80/8		0.1777	0.5905
$r_{100} - c_{1112}$	0.0334		0.3012	0.9281	0.0948		0.1///	0.5905

Standard errors in parentheses p < 0.05, p < 0.01, p < 0.001`Newey-West HAC Standard Errors

		1	on Reg	055101156	vuar it	iiy rain	111100 ()	NODUS ()
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fqphil	fqregl	fqreg2	fqreg3	fqreg4a	fqreg4b	fqreg5	fqreg6
Farm price, previous pd.	0.0682	0.170	0.102	0.266	0.130	0.105	-0.103	0.0381
	(0.0993)	(0.108)	(0.116)	(0.114)	(0.0990)	(0.146)	(0.148)	(0.161)
Wholesale price, previous pd.	0.608^{***}	0.668***	0.696***	0.457***	0.457***	0.668***	0.735***	0.713***
	(0.0736)	(0.116)	(0.111)	(0.107)	(0.0806)	(0.118)	(0.0977)	(0.121)
Change in wholesale price	0.730***	1.159***	0.947***	0.789***	0.570***	0.775***	0.811***	0.946***
	(0.154)	(0.151)	(0.149)	(0.130)	(0.0615)	(0.0537)	(0.0981)	(0.139)
Ratio of Procurement and Prod'n	-10 33	-2 041	-12 62	-11 27	-7 908***	-6 391**	-2 738	-13 74**
	(5.721)	(2.801)	(7.648)	(7.873)	(2.051)	(1.964)	(2.453)	(4.982)
cons	1 554	0 288	0.522	2 146	3 261**	-0.0406	0 379	0.690
	(0.926)	(1.313)	(1.196)	(1.352)	(0.978)	(0.703)	(0.691)	(1.044)
Ν	52	52	52	52	52	52	52	52
adi R^2	0.860	0.827	0.816	0 755	0.848	0 903	0.847	0.883
Durbin's alternative test for autoc	orrelation	0.027	0.010	0.755	0.010	0.905	0.017	0.005
chi?	0.043	0.009	0.203	2 733	0.538	0.048	0.170	0 447
Proh > chi2	0.8357	0.009	0.6526	0.0983	0.632	0.8266	0.170	0.5030
	(9) fareg7	(10) fareg8	(11) fareg9	(12) foreg10	(13) foreg11	(14) foreg12	(15) foreg13	(16) faarmm
F	0.199	141ego	141eg9	141eg10		0.02.41	141eg15	0.2(5**
Farm price, previous pd.	(0.128)	(0.405)	(0.127)	(0.1294)	-0.0550	(0.0341)	(0.185)	0.305
	(0.128)	(0.161)	(0.127)	(0.122)	(0.223)	(0.117)	(0.160)	(0.120)
Wholesale price, previous pd.	0.208^{**}	0.374**	0.514***	0.377^{***}	0.812***	0.850^{***}	0.566***	0.247***
	(0.0683)	(0.110)	(0.0855)	(0.0838)	(0.173)	(0.108)	(0.128)	(0.0652)
Change in wholesale price	0.333*	0.398***	0.744***	0.714***	0.752***	0.792***	1.038***	0.314*
0 1	(0.131)	(0.0735)	(0.124)	(0.0943)	(0.106)	(0.0789)	(0.0836)	(0.140)
Ratio of Procurement and Prod'n	-117.3	-20.17	-22.98**	-8.299	0.333	-5.554***	-373.4***	-1.665
	(83.10)	(11.49)	(7.446)	(5.993)	(1.691)	(1.434)	(45.62)	(1.565)
cons	7.097***	0.578	2.611	2.116	-0.970	-0.962	0.335	3.524**
_	(1.366)	(0.972)	(1.345)	(1.170)	(0.743)	(0.543)	(1.180)	(1.147)
N	52	51	52	52	52	52	51	52
adj. R^2	0.341	0.800	0.669	0.727	0.804	0.931	0.783	0.554
Durbin's alternative test for autoco	rrelation							
Durbin's alternative test for autoco chi2	rrelation 0.213	3.811	0.462	0.015	0.007	0.913	3.814	0.145

Table 8a: Ravallion Re	gressions: Quarter	lv Farm Pr	ice (Robust)

Standard errors in parentheses p < 0.05, p < 0.01, p < 0.001

Region	Monthly	Quarterly	α
Philippines	6.00	1.12	n.s
1	2.00	0.25	n.s
2	3.53	0.15	n.s
3	4.06	0.58	**
4-A	3.58	0.28	n.s
4- B	1.49	0.16	n.s
5	2.03	0.14	n.s
6	2.87	0.04	n.s
7	9.60	0.92	n.s
8	1.11	1.08	*
9	2.18	0.17	n.s
10	3.92	0.77	**
11	1.45	0.07	n.s
12	1.84	0.04	n.s
13	1.87	0.31	n.s
ARMM	3.39	4.00	***

Table 9: Index of Market Concentration (IMC) of Farm Gate to Wholesale Market, byRegion

Notes:

$$IMC = \frac{\alpha}{\beta_0 + \beta_1}$$

* p < 0.01, ** p < 0.05, *** p < 0.10

Table Iva. Ravanion Regressions. Monthly Retain Trees (Robust)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			
	rphil	rmm^	rcar	rreg1^	rreg2	rreg3	rreg4a	rreg4b	rreg5^			
Retail price, previous pd.	0.596***	0.673***	0.683***	0.758***	0.616***	0.667^{***}	0.831***	0.670***	0.731***			
	(0.0866)	(0.111)	(0.0620)	(0.0463)	(0.0605)	(0.0649)	(0.0430)	(0.0443)	(0.0585)			
****	0 405***	0.004**	0.210***	0.005***	0 411***	0.225***	0.170***	0.044***	0 221***			
wholesale price, previous	0.43/	0.324	0.310	0.225	0.411	0.335	0.1/9	0.344	0.321			
pd.	(0.0889)	(0.104)	(0.0609)	(0.0440)	(0.0643)	(0.0621)	(0.0467)	(0.0454)	(0.0621)			
Change in wholesale	0.890***	0 577***	0.815***	0.953***	0.899***	0 976***	0.873***	0 783***	0.957***			
nrice	(0.0721)	(0.130)	(0.0733)	(0.0668)	(0.0770)	(0.0297)	(0.0605)	(0.0442)	(0.144)			
price	(0.0721)	(0.150)	(0.0755)	(0.0000)	(0.0770)	(0.02)7)	(0.0005)	(0.0112)	(0.144)			
dum9596	0.0327	0.275	0.157	0.161	-0.00214	0.182	0.0140	0.128	0.0969			
	(0.0565)	(0.212)	(0.161)	(0.0932)	(0.0883)	(0.117)	(0.0754)	(0.0842)	(0.149)			
dum0700	0.0160	0.0470	0.0260	0.120*	0.0529	0.102*	0.0507	0.0704	0.0576			
dum9/99	-0.0160	0.0470	-0.0360	0.129	-0.0328	0.103	0.0507	0.0794	-0.0376			
	(0.0350)	(0.126)	(0.0627)	(0.0510)	(0.0535)	(0.0515)	(0.0695)	(0.0591)	(0.0797)			
cons	0.0980	0.698	0 548	0.617**	0 134	0.477	0.0903	0.267	-0 349			
_cons	(0.183)	(0.567)	(0.332)	(0.217)	(0.223)	(0.247)	(0.154)	(0.20)	(0.487)			
N	227	(0.307)	(0.332)	227	227	227	227	227	(0.487)			
$\frac{1}{1}$	227	221	227	221	227	227	227	227	221			
adj. K	0.995		0.978		0.982	0.993	0.991	0.990				
Durbin's alternative test	for autoco	orrelation										
chi2	0.243		1.940		1.699	3.369	1.173	0.484				
Prob > chi2	0.6223		0.1637		0.1924	0.0664	0.2788	0.4865				

$1 a \mu \alpha 1 \nu \alpha 1 \nu \alpha 1 \alpha 1 \alpha 1 \alpha 1 \alpha 1 \alpha 1 \alpha 1$	Table 10a: Ravallior	Regressions:	Monthly	Retail Prices	(Robust
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	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	rreg6	rreg7^	rreg8	rreg9	rreg10	rreg11	rreg12	rreg13	rarmm
Retail price, previous pd.	0.845***	0.832***	0.617***	0.673***	0.654***	0.612***	0.538***	0.754***	0.648***
	(0.0467)	(0.0388)	(0.0832)	(0.0689)	(0.0567)	(0.0451)	(0.0662)	(0.0468)	(0.0636)
Wholesale price, previous	0.186***	0.226***	0.353***	0.336***	0.373***	0.435***	0.461***	0.294***	0.360***
pd.	(0.0477)	(0.0449)	(0.0745)	(0.0700)	(0.0559)	(0.0416)	(0.0416)	(0.0510)	(0.0653)
Change in wholesale	0.947***	0.702***	0.929***	0.805***	0.779***	0.880***	0.731***	0.866***	0.831***
price	(0.0956)	(0.0760)	(0.103)	(0.0465)	(0.0584)	(0.0728)	(0.0826)	(0.0832)	(0.0550)
dum9596	-0.0612	-0.203	0.268^{*}	0.132	-	-0.0351	-0.169	-0.155	-0.0489
					0.00817				
	(0.153)	(0.132)	(0.113)	(0.0953)	(0.114)	(0.123)	(0.140)	(0.102)	(0.108)
dum9799	0.00885	-0.216**	0.0554	-0.0200	-0.0888	-0.0237	-0.0904	-0.0919	-0.248**
	(0.0968)	(0.0718)	(0.0609)	(0.0541)	(0.0686)	(0.0707)	(0.0795)	(0.0585)	(0.0776)
cons	-0.124	-0.631*	1.071**	0.259	0.0935	-0.217	0.820	-0.426	0.405
—	(0.521)	(0.300)	(0.391)	(0.274)	(0.345)	(0.437)	(0.654)	(0.404)	(0.261)
Ν	227	227	227	227	227	227	227	227	227
adj. R^2	0.971		0.976	0.984	0.976	0.978	0.975	0.979	0.986
Durbin's alternative tes	t for autoco	rrelation							
chi2	0.024		0.644	1.860	1.452	0.565	1.157	3.072	0.844
Prob > chi2	0.8767		0.4224	0.1727	0.2282	0.4521	0.2820	0.0796	0.3584

Monitoring and Evaluation	of Agricultural Policy	Indicators: Annex 2.2
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	Table	10b: Rava	allion Re	gressions	: Quartei	rly Retail	Prices (R	lobust)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	rqphil^	rqmm^	rqcar^	rqreg1^	rqreg2^	rqreg3^	rqreg4a^	rqreg4b^	rqreg5^
rqphilp	0.751^{***}	0.788^{***}	0.864^{***}	0.678^{**}	0.715 ^{***}	0.878^{***}	0.646^{**}	0.697^{***}	0.692**
	(0.154)	(0.216)	(0.148)	(0.204)	(0.156)	(0.0989)	(0.199)	(0.160)	(0.207)
wanhiln	0 262	0 223	0.150	0.328	0 289	0.128	0 359	0 309	0 320
" Ipinip	(0.154)	(0.221)	(0.146)	(0.203)	(0.157)	(0.100)	(0.201)	(0.163)	(0.208)
wqphilch	0.975^{***} (0.0260)	0.992 ^{***} (0.0116)	0.992^{***} (0.0121)	0.992 ^{***} (0.0118)	0.965 ^{***} (0.0303)	1.001 ^{****} (0.00675)	0.945 ^{***} (0.0605)	0.954^{***} (0.0424)	0.973 ^{***} (0.0240)
_cons	-0.226 (0.179)	-0.175 (0.201)	-0.232 (0.144)	-0.0896 (0.0886)	-0.0549 (0.133)	-0.101 (0.0676)	-0.0614 (0.123)	-0.0775 (0.175)	-0.192 (0.147)
$\frac{N}{\text{adj. }R^2}$	75	75	75	75	75	75	75	75	75
<u>_</u>									
	(10) rqreg6^	(11) rqreg7^	(12) rqreg8^	(13) rqreg9^	(14) rqreg10^	(15) rqreg11^	(16) rqreg12^	(17) rqreg13^	(18) rqarmm^
rqreg5p	0.534^{*}	0.845^{***}	0.649***	0.673***	0.561**	0.479	0.450	0.777^{***}	0.720^{***}
-	(0.209)	(0.0912)	(0.111)	(0.183)	(0.212)	(0.279)	(0.255)	(0.125)	(0.185)

	Table 10b: Ravallion	Regressions:	Quarterly	Retail Prices	(Robust)
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0.496* 0.185 0.357** 0.336 0.461^{*} 0.538 0.581^{*} 0.239 0.290 wqreg5p (0.205) (0.0993) (0.114)(0.183) (0.203)(0.272)(0.256) (0.126)(0.186) 0.974*** 0.979^{***} 0.972*** 1.000*** 0.904*** 0.962*** 0.935*** 0.985*** 0.987*** wqreg5ch (0.0435) (0.0385) (0.0202)(0.00428)(0.0720)(0.0370) (0.0637) (0.0156) (0.0210) -0.272 -0.0865 -0.339 -0.254 -0.466 -0.555 -0.136 -0.462 -0.156 _cons (0.413) (0.418) (0.143)(0.151) (0.475)(0.322)(0.373) (0.232)(0.122) 75 75 75 75 75 75 75 N 75 75 adj. R^2

Standard errors in parentheses p < 0.05, p < 0.01, p < 0.001^Newey-West HAC Standard Errors

	(1) rphilch^	(2) fphilch^
ne	0.00109	0.000639
	(0.000674)	(0.00107)
stphil	-0.00000184 [*] (0.000000876)	
procphil		0.00000132
-		(0.00000191)
bkkch	-0.0000261	0.0000250
	(0.0000948)	(0.0000818)
lumjan	-0.818**	
	(0.305)	
lumfeb	-0.711*	0.0552
	(0.342)	(0.146)
lummar	-0.692*	-0.149
	(0.341)	(0.154)
umapr	-0.696*	-0.0502
	(0.339)	(0.144)
ummay	-0.631	-0.118
-	(0.323)	(0.141)
lumjun	-0.602*	-0.0524
5	(0.286)	(0.140)
lumjul	-0.303	-0.190
	(0.268)	(0.156)
lumaug		-0.489**
		(0.183)
umsep	-0.588*	-1.267***
	(0.236)	(0.177)
lumoct	-1.143***	-0.788***
	(0.310)	(0.190)
dumnov	-1.158**	-0.407*
	(0.346)	(0.166)
lumdec	-0.859**	-0.0409
	(0.326)	(0.149)
dum91	-0.274**	-0.120
	(0.0907)	(0.150)

Table 11: YSM Regressions: Farm and Retail. Philippines

V	(1)	(2)
	(1) rnhilah∆	(∠) fnhilah∆
hum02	0.0280	0.120
1011192	(0.0389)	(0.139)
	(0.0927)	(0.158)
lum93	0.155	0.168
	(0.115)	(0.157)
		. ,
um94	-0.0706	0.132
	(0.116)	(0.123)
um05	0.251	0.410
umys	(0.472)	(0.216)
	(0.472)	(0.210)
um96	-0.0570	-0.110
	(0.202)	(0.219)
	0.100	0 115
/ לוווג	-0.109	(0.113)
	(0.117)	(0.144)
um98	-0.00628	-0.00264
	(0.0776)	(0.161)
	0.0201	0.0270
11199	-0.0381	-0.0378
	(0.100)	(0.150)
um00	-0.0405	0.0368
	(0.0842)	(0.167)
um01	-0.121	0.0202
	(0.107)	(0.161)
m02	0.00259	0.0719
11102	(0.0809)	(0.160)
	<pre></pre>	()
1m03	-0.0794	-0.0104
	(0.0897)	(0.155)
1m04	-0 0480	0.0653
анну т	(0.0935)	(0.165)
	(0.0955)	(0.100)
um05	0.0840	0.0533
	(0.0954)	(0.220)
ang	0.715*	0 1 2 0
cons	(0.713)	(0.128)
	203	203
lj. R^2	0.210	0.417
urbin-Watson statistic	1.924528	1.969824

Table 11: Shively Farm and Retail Philippine Level - Continued

Standard errors in parentheses $p^* < 0.05$, $p^{**} < 0.01$, $p^{***} < 0.001$ ^Prais-Winsten AR(1) regression

Region	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Philippines	0.76	1.04	0.76	0.66	0.56	1.54	1.94	0.84	1.07	0.87	0.87	0.49	0.75	0.64	0.80	0.92	0.70	0.58	2.15
NCR	N/A																		
CAR	0.83	0.85	1.57	1.39	0.76	1.97	2.42	1.35	0.82	1.54	1.17	0.79	0.66	0.78	0.93	1.09	0.99	0.73	2.58
1	0.58	1.60	1.05	0.99	1.07	2.79	3.10	1.07	1.02	1.16	1.04	0.94	0.94	1.00	1.15	1.11	0.85	0.69	1.78
2	1.45	0.87	1.03	0.94	0.73	2.15	2.71	1.15	1.25	1.42	1.43	0.74	1.24	0.90	1.15	1.16	0.63	0.83	2.71
3	0.50	1.06	0.36	1.01	1.03	2.41	3.06	0.94	0.92	1.17	0.91	0.55	0.91	1.00	1.11	1.01	0.98	1.05	2.65
4-A	0.78	1.41	0.68	0.95	0.87	2.24	2.80	0.77	0.94	0.88	1.00	0.92	0.61	0.24	0.62	0.57	0.71	0.48	2.51
4-B	0.99	0.95	0.78	0.97	0.82	2.98	1.59	1.21	1.61	0.71	0.75	0.49	0.55	1.09	0.78	1.14	0.68	0.85	2.03
5	1.15	1.18	0.99	0.92	0.45	1.78	1.89	0.82	1.01	1.00	0.97	0.68	0.45	0.97	1.35	0.94	0.69	0.43	1.92
6	1.62	1.63	1.32	1.18	0.95	1.63	1.92	1.31	1.65	0.59	1.05	0.62	1.03	1.17	0.73	1.43	1.11	1.02	1.58
7	1.02	2.20	1.17	0.72	0.51	1.22	1.19	1.13	1.11	0.94	1.67	0.85	0.81	0.86	1.58	1.45	0.95	0.85	2.19
8	0.77	1.06	1.29	1.34	0.59	2.14	1.69	0.80	1.34	0.63	1.04	0.37	0.18	0.23	0.71	0.82	0.30	0.79	1.64
9	1.61	1.43	1.55	0.86	0.83	1.16	2.24	0.71	1.67	0.81	0.98	0.58	0.92	0.50	1.36	1.33	0.99	0.99	2.02
10	1.37	1.07	0.96	0.63	0.75	1.30	1.68	0.68	1.13	0.76	0.69	0.91	0.89	0.58	1.56	0.78	0.83	0.67	2.02
11	0.71	0.87	0.95	0.77	0.83	1.52	1.47	0.59	1.06	0.56	0.99	0.66	0.94	0.46	1.56	1.12	0.71	0.56	2.03
12	1.10	1.45	1.48	0.74	0.88	1.44	1.50	0.72	1.21	0.83	1.22	0.56	1.11	0.99	1.40	1.19	1.01	1.09	1.94
13	0.48	0.75	0.61	0.34	0.70	1.50	1.64	0.81	1.01	0.71	0.94	0.55	1.37	0.58	1.67	1.16	0.50	0.51	1.78
ARMM	0.61	0.98	0.65	0.50	0.89	1.19	1.17	1.27	1.59	0.72	0.57	0.56	1.08	0.95	1.17	0.87	1.34	0.62	2.92
Philippines	0.76	1.04	0.76	0.66	0.56	1.54	1.94	0.84	1.07	0.87	0.87	0.49	0.75	0.64	0.80	0.92	0.70	0.58	2.15

Table A.1a: Standard Deviation of Rice Farm Gate Prices (Deflated), by Region

			1 4010	110100	Stante		e i lati		nee	mores			enace	<i>a)</i> , <i>v</i> j	1105101				
Region	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Philippines	0.55	0.85	0.78	0.92	0.57	2.81	1.16	0.48	0.35	0.43	0.43	0.25	0.46	0.37	0.45	0.57	0.25	0.34	2.13
NCR	0.82	0.55	0.84	1.44	1.46	3.44	2.01	0.54	0.46	0.25	0.29	0.16	0.52	0.25	0.50	0.29	0.17	0.81	2.27
CAR	1.27	0.52	0.29	1.61	0.50	3.84	0.80	0.80	0.24	0.54	0.44	0.26	0.74	0.21	1.00	0.29	0.16	0.68	2.08
1	0.72	0.90	0.42	1.60	0.68	3.52	1.20	0.91	0.34	0.39	0.43	0.43	0.39	0.20	0.12	0.54	0.44	0.69	2.42
2	0.65	0.50	0.50	0.90	0.63	3.13	1.24	0.65	0.28	0.62	0.60	0.19	0.72	0.55	0.61	0.44	0.13	1.41	1.73
3	0.35	0.61	0.38	1.56	0.34	3.49	0.76	0.35	0.28	0.33	0.35	0.20	0.43	0.28	0.38	0.53	0.12	0.31	2.04
4-A	0.27	0.88	0.66	0.55	0.21	4.03	1.00	0.48	0.81	0.40	0.32	0.27	0.29	0.31	0.49	0.41	0.12	0.60	1.90
4-B	0.33	1.01	0.47	1.12	0.34	3.99	0.75	0.46	0.27	0.26	0.28	0.36	0.29	0.48	0.41	0.97	0.26	0.54	2.00
5	0.61	1.14	1.00	1.52	0.54	3.28	1.73	0.43	0.38	0.71	0.41	0.29	0.35	0.35	0.23	0.60	0.23	0.50	2.09
6	1.51	1.18	1.01	1.55	0.51	2.63	1.58	1.29	1.02	0.48	0.93	0.49	0.79	0.68	0.44	1.28	0.81	0.82	1.95
7	0.54	1.16	1.14	1.06	1.27	3.21	1.48	0.56	0.49	0.69	0.66	0.36	0.45	0.28	0.44	0.65	0.27	0.40	2.43
8	0.89	0.84	1.55	1.01	0.77	3.12	1.37	0.36	0.42	0.42	0.42	0.34	0.39	0.31	0.44	0.28	0.18	0.31	2.27
9	1.01	0.91	0.85	0.58	0.95	1.85	1.15	0.49	0.70	0.38	0.50	0.13	0.26	0.38	0.68	0.74	0.31	0.21	2.73
10	0.96	1.42	1.29	0.72	1.06	2.32	1.21	0.49	0.61	0.71	0.64	0.35	0.90	0.47	0.58	0.58	0.36	0.38	2.64
11	0.69	0.97	1.25	0.53	0.78	2.26	1.25	0.85	1.04	0.73	0.85	0.46	1.29	0.88	1.21	1.10	0.57	0.48	2.96
12	0.85	1.30	1.69	0.43	0.94	1.76	1.28	0.82	0.75	0.60	0.57	0.63	1.33	1.11	1.45	1.45	1.06	0.90	2.84
13	0.58	1.16	1.19	0.51	1.08	1.55	0.91	0.76	0.50	0.31	0.44	0.29	0.80	0.48	0.78	0.53	0.19	0.24	2.85
ARMM	0.43	1.22	1.24	0.82	1.02	2.54	1.22	0.38	0.37	0.26	0.55	0.30	0.23	0.39	0.55	0.22	0.39	0.56	2.20

Table A.1b: Standard Deviation of Rice Wholesale Prices (Deflated), by Region

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Philippines	0.36	0.72	0.78	0.93	0.48	3.28	0.90	0.41	0.33	0.35	0.35	0.21	0.51	0.28	0.35	0.43	0.15	0.34	2.25
NCR	0.49	0.55	0.56	1.08	0.54	3.52	0.34	0.39	0.59	0.18	0.41	0.22	0.30	0.20	0.45	0.25	0.16	0.58	2.23
CAR	0.76	0.64	0.39	1.43	0.57	3.74	1.03	0.50	0.22	0.34	0.37	0.25	0.63	0.10	0.56	0.37	0.18	0.83	2.12
1	0.67	0.67	0.35	1.61	0.68	3.94	1.13	0.62	0.19	0.39	0.37	0.48	0.39	0.25	0.32	0.29	0.30	0.37	2.43
2	0.61	0.65	0.33	1.24	0.58	3.61	1.10	0.56	0.32	0.40	0.48	0.16	0.94	0.36	0.33	0.30	0.18	1.26	1.91
3	0.27	0.56	0.39	1.59	0.35	3.64	0.79	0.30	0.27	0.26	0.36	0.22	0.48	0.35	0.30	0.29	0.18	0.40	2.17
4-A	0.45	0.53	1.20	0.46	0.27	4.28	0.65	0.37	0.72	0.36	0.48	0.38	0.40	0.32	0.53	0.33	0.11	0.73	1.87
4-B	0.32	0.56	0.42	1.17	0.29	4.15	0.57	0.26	0.42	0.23	0.28	0.26	0.26	0.28	0.26	0.81	0.13	0.38	1.98
5	0.36	1.07	1.16	1.55	0.43	5.03	1.68	0.28	0.64	0.48	0.29	0.25	0.24	0.34	0.25	0.61	0.21	0.36	1.85
6	1.80	0.99	0.77	1.34	0.43	3.46	0.98	0.94	0.58	0.32	0.78	0.33	0.73	0.68	0.57	1.10	0.55	0.60	1.92
7	0.54	1.63	0.60	0.84	1.11	3.24	1.53	0.42	0.24	0.47	0.60	0.28	0.42	0.14	0.29	0.57	0.09	0.39	2.39
8	0.78	0.50	1.51	0.67	0.78	3.39	1.45	0.49	0.40	0.47	0.38	0.34	0.57	0.33	0.37	0.24	0.19	0.22	2.34
9	0.70	0.84	1.06	0.42	1.18	1.89	0.97	0.36	0.58	0.39	0.54	0.24	0.34	0.29	0.62	0.60	0.23	0.25	2.63
10	0.57	1.20	1.05	0.73	1.03	2.60	0.76	0.24	0.57	0.49	0.58	0.20	0.75	0.36	0.49	0.30	0.19	0.17	2.91
11	0.59	1.02	1.48	0.74	0.72	2.49	0.83	0.59	0.78	0.41	0.50	0.34	1.51	0.75	1.13	0.71	0.33	0.29	3.30
12	0.54	0.81	1.33	0.62	0.68	2.00	0.92	0.60	0.70	0.57	0.67	0.25	0.96	0.71	1.03	1.13	0.56	0.61	3.17
13	0.45	1.02	1.45	0.45	0.82	1.70	0.76	0.63	0.44	0.35	0.36	0.27	1.01	0.45	0.71	0.28	0.15	0.16	3.08
ARMM	0.39	1.07	1.18	0.57	0.79	2.70	1.16	0.26	0.28	0.36	0.24	0.31	0.25	0.30	0.59	0.18	0.33	0.43	2.62

Table A.1c: Standard Deviation of Rice Retail Prices (Deflated), by Region

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	lncar	lnreg1	lnreg2	lnreg3	lnreg4a	lnreg4b	lnreg5	lnreg6
Natural Log Wholesale NCR	0.263***	0.268^{***}	0.315***	0.412***	0.293***	0.346***	0.361***	0.213***
	(0.0325)	(0.0283)	(0.0360)	(0.0255)	(0.0277)	(0.0319)	(0.0366)	(0.0462)
Natural Log, Wholesale Previous Pd.	0.735***	0.756***	0.672***	0.602***	0.760***	0.660***	0.643***	0.753***
	(0.0320)	(0.0265)	(0.0367)	(0.0252)	(0.0232)	(0.0314)	(0.0353)	(0.0448)
cons	-0.00763	-0.0860	0.0149	-0.0461	-0.145***	-0.0256	-0.0360	0.0760
_	(0.0534)	(0.0455)	(0.0473)	(0.0331)	(0.0368)	(0.0443)	(0.0443)	(0.0702)
N	227	227	227	227	227	227	227	227
adj. R^2	0.930	0.952	0.941	0.972	0.975	0.951	0.951	0.878
Standard errors in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$								
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Inreg7	Inreg8	Inreg9	Inreg10	Inreg11	lnreg12	Inreg13	lnarmm
Natural Log Wholesale NCR	0.336***	0.331***	0.547***	0.297***	0.198***	0.167***	0.208***	0.248***
	(0.0355)	(0.0306)	(0.0747)	(0.0350)	(0.0371)	(0.0450)	(0.0288)	(0.0300)
Natural Log, Wholesale Previous Pd.	0.663***	0.648***	0.231***	0.635***	0.730***	0.782***	0.711***	0.768***
	(0.0350)	(0.0327)	(0.0641)	(0.0408)	(0.0422)	(0.0439)	(0.0369)	(0.0281)
cons	0.00582	0.0588	0.636***	0.203***	0.194*	0.127	0.219***	-0.0484
_	(0.0492)	(0.0482)	(0.184)	(0.0583)	(0.0762)	(0.0778)	(0.0655)	(0.0439)
N	227	227	227	227	227	227	227	227
adj. R^2	0.940	0.939	0.398	0.909	0.843	0.852	0.880	0.955

Table A2: Regressions of Regional WP on Manila WP and Previous Regional WP

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

		Table A.Sa.	Kavailioli Keg	iessions. Mont	my raim i ne	e (Dry Season)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fphil	freg1	freg2	freg3	freg4a	freg4b	freg5	freg6
Farm price,	0.673***	0.770***	0.655***	0.606***	0.411**	0.440^{**}	0.714***	0.695***
previous pd.	(0.103)	(0.0895)	(0.0870)	(0.144)	(0.140)	(0.139)	(0.158)	(0.107)
	· · · ·	× /	· /		· /	× /	· /	× /
Wholesale	0.205^{*}	0.132	0.248^{**}	0.235	0.427^{**}	0.356**	0.172	0.165
price,	(0.0906)	(0.0896)	(0.0817)	(0.137)	(0.125)	(0.111)	(0.125)	(0.101)
previous pd.	× ,						~ /	
1 1								
Change in	0.759^{***}	0.657^{***}	0.294	0.132	1.085^{**}	0.905^{**}	0.630^{*}	0.646^{***}
wholesale	(0.207)	(0.178)	(0.183)	(0.560)	(0.369)	(0.274)	(0.239)	(0.172)
price	× ,						~ /	
1								
Ratio of	-19.58	-23.92	-27.67	-18.18	-13.51	-13.82	-8.670	-111.4
Procurement	(20.00)	(41.31)	(20.87)	(27.38)	(24.02)	(16.51)	(12.97)	(74.20)
and	× ,						~ /	
Production								
dum9596	0.239	0.444^{*}	0.542	0.720	-0.0312	0.469	0.252	0.612^{*}
	(0.169)	(0.216)	(0.284)	(0.367)	(0.467)	(0.335)	(0.352)	(0.240)
dum9799	-0.0463	0.0486	-0.0523	-0.0893	-0.455	0.181	0.00114	0.234
	(0.139)	(0.161)	(0.209)	(0.304)	(0.415)	(0.279)	(0.251)	(0.182)
_cons	0.895	1.134*	0.865	1.480	0.0816	1.121	0.546	1.466
	(0.524)	(0.506)	(0.744)	(1.019)	(1.089)	(1.004)	(0.929)	(0.752)
N	52	52	52	52	52	52	52	52
adj. R ²	0.973	0.977	0.948	0.906	0.871	0.891	0.905	0.957
Durbin's alterna	tive test for autoo	correlation						
chi2	0.275	1.997	0.415	0.810	0.947	3.580	0.142	0.342
Prob > chi2	0.6001	0.1576	0.5195	0.3682	0.3304	0.0585	0.7065	0.5588

Table A 3a: Pavallion Pogressions: Monthly Farm Price (Dry Seeson)

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

	1 80	ne A.sa: Kaval	non Regressio	ns: Monthly Fa	irm Price (Dry	Season) - Con	iinuea	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	freg7^	freg8^	freg9	freg10	freg11	freg12	freg13	farmm^
Farm price,	0.870^{***}	0.510***	0.573***	0.720^{***}	0.361*	0.491**	0.383**	0.594***
previous pd.	(0.154)	(0.0982)	(0.139)	(0.106)	(0.160)	(0.157)	(0.129)	(0.123)
Wholesale	0.000836	0.244*	0.266	0.129	0.303*	0.455*	0 424**	0.188
nrice	(0.0820)	(0.121)	(0.151)	(0.0943)	(0.163)	(0.176)	(0.128)	(0.100)
priec, previous pd.	(0.0020)	(0.121)	(0.101)	(0.0713)	(0.105)	(0.170)	(0.120)	(0.101)
Change in	0.204	0.282	0.219	0.472*	0.001**	0.9(1***	0. (9.9**	0.0(52
change in	(0.152)	(0.382)	(0.218)	(0.473)	(0.210)	(0.177)	(0.246)	-0.0033
price	(0.155)	(0.320)	(0.284)	(0.221)	(0.310)	(0.177)	(0.240)	(0.172)
Datia of	108 7	112 1	94 90	20.26	26 55	51 75	2200 1***	10 71
Ratio 01 Producement	498.7	-115.1	-84.89	-29.50	50.55 (58.45)	-31.73	-2280.1	12.71
and	(055.1)	(87.01)	(99.24)	(30.13)	(38.43)	(30.70)	(379.0)	(27.93)
Production								
dum0506	0.0124	0.225	0.0172	0.0436	0.510	0 162	0.216	0.111
uu119390	(0.304)	(0.333)	-0.0173	-0.0430	(0.319)	-0.103	(0.210)	-0.111
	(0.394)	(0.415)	(0.438)	(0.299)	(0.393)	(0.545)	(0.333)	(0.515)
dum9799	-0.367	0.0441	-0.264	-0.215	0.370	0.0467	-0.144	-0.145
	(0.302)	(0.344)	(0.401)	(0.268)	(0.316)	(0.215)	(0.272)	(0.369)
cons	2 082	1 579	1.051	1 558	1 140	-0 379	0 526	1 908
_00115	(1.359)	(1.806)	(1.592)	(1.019)	(1.516)	(1.051)	(1.304)	(0.988)
Ν	52	52	52	52	52	52	52	52
adj. R^2			0.789	0.865	0.774	0.947	0.838	
Durbin's alterna	tive test for autoc	orrelation						
chi2			2.124	0.208	0.671	0.027	1.189	
Prob > chi2			0.1450	0.6480	0.4128	0.8698	0.2755	

Table A.3a: Ravallio	n Regressions: Mont	nlv Farm Price	e (Drv S	eason) - Continued

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

		I doite i lie a		Si essionsi illo	intering in an in it in	ee (mai vese se	uson)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fphil	freg1	freg2	freg3	freg4a	freg4b	freg5	freg6
fphilp	0.700***	0.123	0.275^{*}	0.657***	0.514**	0.270	0.319*	0.391***
	(0.149)	(0.182)	(0.126)	(0.132)	(0.163)	(0.137)	(0.128)	(0.106)
wphilp	0.184	0.379	0.406^{**}	0.0182	0.182	0.443***	0.438***	0.559***
1 1	(0.114)	(0.200)	(0.135)	(0.128)	(0.113)	(0.111)	(0.105)	(0.0931)
wphilch	0.620***	0.844^{*}	0.609**	0.257	-0.226	0.494**	1.242***	1.025***
. I	(0.152)	(0.324)	(0.221)	(0.316)	(0.240)	(0.150)	(0.265)	(0.160)
procphil	-34 51	-60.05	-149 1**	-27 61	-12.96	-9 438	-59.83**	-73 65*
proop	(23.49)	(33.08)	(44.08)	(30.46)	(11.55)	(7.855)	(21.88)	(31.10)
dum9596	0.200	1.620^{*}	0.711	1.435*	0.0296	0.400	0.342	-0.381
	(0.294)	(0.703)	(0.461)	(0.621)	(0.592)	(0.345)	(0.353)	(0.283)
dum9799	-0.0994	0.662	0.311	0.546	0.120	-0.126	-0.0370	-0.404*
	(0.209)	(0.474)	(0.296)	(0.431)	(0.384)	(0.244)	(0.230)	(0.174)
cons	0.739	4.972 [*]	2.362	3.951*	2.633*	1.099	0.345	-1.156
—	(0.843)	(1.922)	(1.222)	(1.566)	(1.177)	(0.842)	(0.884)	(0.781)
N	52	52	52	52	52	52	52	52
adj. R^2	0.932	0.703	0.867	0.772	0.811	0.931	0.914	0.944
Durbin's alter	mative test for a	utocorrelation						
chi2	0.912	0.000	0.250	1.728	0.545	0.144	0.763	0.050
Prob > chi2	0.3395	0.9877	0.6169	0.1887	0.4602	0.7039	0.3823	0.8224

 Table A.3b: Ravallion Regressions: Monthly Farm Price (Harvest Season)

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

[^]Newey-West HAC Standard Errors

	Table A.5D:	Kavallion Ke	gressions: Mo	ntniy farm P	rice (Harvest)	season) - C <i>oni</i>	inuea	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	freg7	freg8	freg9	freg10	freg11	freg12^	freg13	farmm
freg7p	0.247^{*}	0.194	0.491***	0.516***	0.458^{***}	0.650^{***}	0.584^{***}	0.358^{*}
	(0.110)	(0.130)	(0.120)	(0.117)	(0.127)	(0.116)	(0.108)	(0.137)
wreg7p	0.0894	0.492***	0.389**	0.386***	0.441***	0.241*	0.212	0.465**
	(0.0737)	(0.115)	(0.129)	(0.0909)	(0.112)	(0.0994)	(0.116)	(0.148)
wreg7ch	0.447^{*}	0.214	0.973***	0.813***	0.811***	0.743***	0.618***	0.712
C	(0.179)	(0.175)	(0.217)	(0.124)	(0.104)	(0.143)	(0.151)	(0.395)
procreg7	-1128.8**	-1095.3	-89.10	-25.32	20.21	-18.94	-454.7	-8.068
	(353.9)	(749.8)	(57.25)	(40.69)	(15.31)	(10.04)	(769.8)	(25.31)
dum9596	1.114^{*}	0.0345	-0.307	-0.292	-0.170	0.526^{*}	0.632	-1.204
	(0.513)	(0.457)	(0.524)	(0.349)	(0.292)	(0.228)	(0.347)	(0.812)
dum9799	0.522	0.209	-0.246	-0.683**	-0.0548	0.306^{*}	0.0221	-0.667
	(0.294)	(0.294)	(0.394)	(0.246)	(0.181)	(0.144)	(0.237)	(0.619)
cons	7.823***	0.874	-0.404	-0.865	-0.916	0.749	1.104	-0.223
-	(1.629)	(1.343)	(1.910)	(1.330)	(0.902)	(0.578)	(1.238)	(2.206)
Ν	52	52	52	52	52	52	52	52
adj. R ²	0.606	0.837	0.750	0.850	0.922		0.878	0.511
Durbin's alternative	test for autocorrelati	on						
chi2	0.626	0.001	0.005	0.177	0.346		0.032	3.413
Prob > chi2	0.4290	0.9757	0.9437	0.6742	0.5562		0.8572	0.0647

Table A 3b: Pavallion Pagrossions: Monthly Farm Price (Harvest Season) Continued

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

			able A. 5c: Ra	ivaliion farm i	Frice (OII Seas	on)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fphil	freg1	freg2	freg3	freg4a	freg4b	freg5	freg6
Farm price,	1.217***	0.531*	0.741^{***}	0.625^{***}	0.661**	0.651**	0.457^{**}	0.739^{***}
previous pd.	(0.164)	(0.210)	(0.185)	(0.169)	(0.188)	(0.194)	(0.147)	(0.133)
Wholesale	-0.264	0.155	0.0919	0.0180	0.0910	-0.0541	0.109	0.00214
price,	(0.133)	(0.187)	(0.187)	(0.150)	(0.125)	(0.233)	(0.146)	(0.122)
previous pd.								
Change in	0.683***	1 112***	0.700**	0.995***	0 338	1.045***	0.990***	0.756***
wholesale	(0.142)	(0.217)	(0.211)	(0.210)	(0.197)	(0.196)	(0.161)	(0.111)
price	(0.112)	(0.217)	(0.211)	(0.210)	(0.177)	(0.170)	(0.101)	(0.111)
price								
Ratio of	119.1	105.3	54.88	67.38	-21.32	21.65	-48.36	-94.63
Procurement	(95.96)	(167.4)	(165.0)	(106.0)	(60.07)	(76.07)	(45.34)	(138.1)
and Prod'n					× /			
1 0500	0.160	1 1 4 1	0.2(1	0.507	0.077	1.500	0.047	0.464
dum9596	0.162	1.141	0.361	0.507	0.866	1.560	0.847	0.464
	(0.442)	(0.718)	(0.723)	(0.822)	(0.596)	(0.784)	(0.634)	(0.490)
dum9799	0.316	0.215	0.164	0.403	0.251	0.919	0.474	0.362
	(0.270)	(0.430)	(0.448)	(0.484)	(0.388)	(0.516)	(0.372)	(0.308)
	× /			~ /	()	,	· · · ·	
cons	1.235	3.873^{*}	1.724	4.698^{*}	2.696	5.040^{*}	4.314**	2.939^{*}
	(1.298)	(1.682)	(2.000)	(2.149)	(1.380)	(2.311)	(1.578)	(1.402)
Ν	52	52	52	52	52	52	52	52
adj. R^2	0.893	0.871	0.776	0.731	0.842	0.842	0.816	0.881
Durbin's alterna	tive test for autoc	correlation						
chi2	0.021	1.454	1.750	1.878	1.440	0.042	0.444	1.832
Prob > chi2	0.2280	0.1858	0.1706	0.2301	0.9578	0.8371	0.5051	0.1758

Table A 3a: Pavallian Farm Price (Off Season)

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

		I able 1	1. oc. Ravallo		On Scuson, C	onninaca		
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	freg7	freg8^	freg9	freg10^	freg11^	freg12	freg13	farmm
Farm price,	0.730***	0.433	0.475^{**}	0.594**	0.503^{*}	0.810^{***}	0.276	0.583***
previous pd.	(0.134)	(0.227)	(0.169)	(0.208)	(0.192)	(0.157)	(0.162)	(0.145)
Wholesale	-0.0595	0.311	0.112	0.0933	0.309	-0.0302	0.336	0.242
price,	(0.132)	(0.167)	(0.199)	(0.171)	(0.206)	(0.174)	(0.191)	(0.141)
previous pd.								
		at at at			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1		ate ate ate	
Change in	0.341	0.865***	0.984***	0.718**	0.657***	0.774***	1.073***	-0.0890
wholesale	(0.207)	(0.185)	(0.255)	(0.207)	(0.140)	(0.107)	(0.234)	(0.328)
price								
Ratio of	-379.5	-2396.3	-170.2	-177.2	-69.90	-37.72	-5174.8	-17.21
Procurement	(925.7)	(1812.0)	(102.3)	(153.4)	(53.41)	(46.07)	(5489.5)	(75.01)
and Prod n								
dum0506	0.078	0.285	0 275	0.420	0.242	0.510	0.620	0.020
uu119390	(0.978)	-0.283	(0.373)	(0.429)	(0.242)	(0.310)	(0.548)	-0.930
	(0.948)	(0.030)	(0.778)	(0.387)	(0.313)	(0.438)	(0.348)	(0.939)
dum9799	0.247	0.437	0.223	0.299	0.0353	0.261	-0.325	-0.581
	(0.541)	(0.632)	(0.544)	(0.412)	(0.271)	(0.270)	(0.399)	(0.638)
	(111)	()	()		()	()	()	(
cons	4.332	1.407	4.701	3.338	0.707	2.834	3.314	1.151
_	(2.664)	(1.914)	(2.766)	(2.291)	(1.774)	(1.510)	(2.240)	(2.319)
Ν	52	52	52	52	52	52	52	52
adj. R^2	0.508		0.617			0.912	0.682	0.446
Durbin's alterna	tive test for autoo	correlation						
chi2	0.348		1.221			1.769	1.463	0.021
Prob > chi2	0.5554		0.2692			0.1835	0.2265	0.8844

|--|

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

				(-) /2	/		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
rphil	rmm	rcar	rreg1	rreg2	rreg3^	rreg4a	rreg4b	rreg5
0.693***	0.804^{***}	0.853***	0.869***	0.636***	0.591***	0.872^{***}	0.665***	0.821***
(0.0729)	(0.0526)	(0.0845)	(0.0738)	(0.0864)	(0.146)	(0.0573)	(0.0821)	(0.0462)
0.318***	0.182***	0.196*	0.128	0.375***	0.425**	0.131*	0.366***	0.182***
(0.0729)	(0.0471)	(0.0791)	(0.0725)	(0.0929)	(0.144)	(0.0608)	(0.0830)	(0.0501)
0.914***	0.437***	0.701***	0.963***	0.813***	1.071***	0.738***	0.882***	0.749***
(0.0304)	(0.0552)	(0.0803)	(0.0548)	(0.0702)	(0.0378)	(0.0558)	(0.0479)	(0.0466)
-0.0252	0.0526	-0.210	-0.00793	0.0895	0.214	-0.0332	-0.00155	0.0340
(0.0493)	(0.166)	(0.160)	(0.101)	(0.152)	(0.206)	(0.114)	(0.103)	(0.0944)
0.0541	0.128	-0.225	0.0249	0.0200	0.126	0.0432	0.112	0.0722
(0.0428)	(0.141)	(0.114)	(0.0881)	(0.120)	(0.0954)	(0.0958)	(0.0997)	(0.0716)
0 282	0 661	-0.531	0 225	0 342	0 333	0 146	-0.0280	0 274
(0.182)	(0.512)	(0.450)	(0.296)	(0.386)	(0.446)	(0.262)	(0.316)	(0.227)
76	76	76	76	76	76	76	76	76
0.998	0.978	0.977	0.989	0.980		0.993	0.991	0.994
0.111	0.853	0.403	2.418	0.023		0.187	2.292	0.167
0.7385	0.3556	0.5253	0.1199	0.8799		0.6655	0.1300	0.6827
	(1) rphil 0.693*** (0.0729) 0.318*** (0.0729) 0.914*** (0.0304) -0.0252 (0.0493) 0.0541 (0.0428) 0.282 (0.182) 76 0.998 0.111 0.7385	$\begin{array}{c ccccc} & & & & & & & & \\ \hline (1) & (2) & & & & & \\ rphil & & rmm & & \\ \hline 0.693^{***} & 0.804^{***} & \\ \hline (0.0729) & (0.0526) & \\ \hline 0.318^{***} & 0.182^{***} & \\ \hline (0.0729) & (0.0471) & \\ \hline 0.914^{***} & 0.437^{***} & \\ \hline (0.0304) & (0.0552) & \\ \hline -0.0252 & 0.0526 & \\ \hline (0.0493) & (0.166) & \\ \hline 0.0541 & 0.128 & \\ \hline (0.0428) & (0.141) & \\ \hline 0.282 & 0.661 & \\ \hline (0.182) & (0.512) & \\ \hline 76 & 76 & \\ 0.998 & 0.978 & \\ \hline 0.111 & 0.853 & \\ 0.3556 & \\ \hline \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					

Table A.4a: Ravallion Regressions: Monthly Retail Price (Dry Season)

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

	amon Reg		ionuny ix		liee (Dig Season) Commune					
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
	rreg6	rreg7	rreg8	rreg9^	rreg10	rreg11	rreg12	rreg13	rarmm	
Retail price, previous pd.	0.891***	0.803***	0.704^{***}	0.632***	0.651***	0.470^{***}	0.414^{***}	0.759^{***}	0.562***	
	(0.0543)	(0.0446)	(0.0776)	(0.0772)	(0.0893)	(0.0810)	(0.0837)	(0.0674)	(0.0983)	
Wholesale price previous pd	0.0925	0 277***	0.234**	0.371***	0 368***	0.516***	0 574***	0.260***	0 / 10***	
wholesale price, previous pa.	(0.0523)	(0.277)	(0.0715)	(0.0767)	(0.0833)	(0.0784)	(0.0777)	(0.20)	(0.942)	
	(0.0504)	(0.0390)	(0.0713)	(0.0707)	(0.0033)	(0.0784)	(0.0777)	(0.0003)	(0.0942)	
Change in wholesale price	0.795***	0.671***	0.580^{***}	0.876^{***}	0.767^{***}	0.763***	0.662***	0.799***	0.865***	
	(0.0524)	(0.0790)	(0.0709)	(0.0678)	(0.0606)	(0.0490)	(0.0483)	(0.0497)	(0.0582)	
							× /		× ,	
dum9596	0.154	-0.281	0.195	0.143	-0.0441	0.137	-0.326**	-0.0671	0.165	
	(0.109)	(0.196)	(0.154)	(0.0915)	(0.136)	(0.0996)	(0.109)	(0.0858)	(0.146)	
dum0700	0.0248	0.294*	0.201	0.0100	0.0260	0.221*	0.0169	0.0252	0.121	
duili9799	(0.0346)	-0.364	(0.118)	-0.0100	(0.117)	(0.221)	(0.0108)	-0.0232	-0.131	
	(0.0930)	(0.100)	(0.118)	(0.0081)	(0.117)	(0.0801)	(0.0823)	(0.0093)	(0.120)	
cons	0.489	-0.919	1.488**	0.381	0.226	0.921*	1.226**	-0.112	0.946*	
	(0.368)	(0.493)	(0.478)	(0.312)	(0.521)	(0.350)	(0.398)	(0.326)	(0.441)	
N	76	76	76	76	76	76	76	76	76	
adj. R^2	0.985	0.977	0.978		0.979	0.987	0.984	0.987	0.983	
Durbin's alternative test for autocorrelation										
chi2	0.006	0.974	0.010		0.016	0.284	0.557	0.071	0.044	
Prob > chi2	0.9406	0.3238	0.9221		0.8984	0.5940	.4554	0.7895	0.8339	

Table A.4a: Ravallion Regressions: Monthly Retail Price (Dry Season) - Continued

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

		ivanion ite	5 ¹ C 55 ¹ 0 ¹¹ 5 ¹	vionenty ite	etan i nee (IIIII VESU SC	usonj		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(9)	(8)
	rphil^	rmm	rcar	rreg1	rreg2	rreg3	rreg4a	rreg5	rreg4b^
Retail price, previous pd.	0.636***	0.564^{***}	0.681***	0.638***	0.749^{***}	0.683***	0.767^{***}	0.716***	0.653***
	(0.102)	(0.0900)	(0.0794)	(0.0726)	(0.0883)	(0.0812)	(0.0550)	(0.0482)	(0.0686)
Wholesale price, previous pd.	0.354**	0.452***	0.265***	0.281***	0.244*	0.292***	0.234***	0.284***	0.337***
	(0.106)	(0.0967)	(0.0762)	(0.0788)	(0.101)	(0.0827)	(0.0601)	(0.0588)	(0.0711)
Change in wholesale price	0.614***	0.580***	0.563***	0.724***	0.707***	0.779***	0.754***	0.642***	0.628***
•	(0.0517)	(0.148)	(0.0633)	(0.0681)	(0.0746)	(0.0645)	(0.0611)	(0.0842)	(0.129)
dum9596	0.133	0.628	0.0326	0.410**	-0.0227	0.282^{*}	-0.0402	0.106	0.101
	(0.113)	(0.418)	(0.161)	(0.153)	(0.155)	(0.123)	(0.149)	(0.144)	(0.213)
dum9799	0.0348	-0.120	0.0816	0.395***	-0.0192	0.129	0.0578	0.0759	0.0597
	(0.0476)	(0.290)	(0.101)	(0.108)	(0.101)	(0.0880)	(0.1000)	(0.0836)	(0.128)
cons	0.721**	0.685	1.279**	1.737***	0.442	0.874^{**}	0.335		0.721
—	(0.244)	(1.107)	(0.431)	(0.380)	(0.410)	(0.313)	(0.286)	0.482	(0.573)
N	75	75	75	75	75	75	75	(0.304)	75
adj. R^2		0.913	0.981	0.984	0.983	0.993	0.994	75	
Durbin's alternative test for auto	correlation								
chi2		0.112	0.088	2.962	0.047	0.004	0.342	1.909	
Prob > chi2		0.7382	0.7663	0.0852	0.8289	0.9523	0.5585	0.1670	

Table A.4b: Ravallion Regressions: Monthly Retail Price (Harvest Season)

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

^Newey-West HAC Standard Errors

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	rreg5	rreg6	rreg7	rreg8	rreg9^	rreg10	rreg11	rreg12 [^]	rreg13	rarmm
Retail price, previous pd.	0.716***	0.910***	0.954***	0.682***	0.669***	0.767***	0.503***	0.498***	0.776***	0.921***
	(0.0482)	(0.0463)	(0.0512)	(0.0918)	(0.0794)	(0.0635)	(0.0790)	(0.108)	(0.0429)	(0.0492)
Wholesale price, previous pd.	0.284***	0.0547	0.0321	0.317***	0.344***	0.195*	0.476***	0.444***	0.191***	0.0935*
······································	(0.0588)	(0.0529)	(0.0754)	(0.0916)	(0.0844)	(0.0750)	(0.0854)	(0.0903)	(0.0492)	(0.0432)
Change in wholesale price	0.642***	0 737***	0 322**	0 796***	0.641***	0 577***	0 719***	0 578***	0 566***	0 586***
change in wholesale price	(0.0842)	(0.0555)	(0.0985)	(0.0673)	(0.0774)	(0.0519)	(0.0539)	(0.0806)	(0.0560)	(0.0763)
dum0506	0.106	0 142	0.0281	0.0874	0.00716	0.0642	0.335*	0.0375	0.0524	-0.171
ddii19590	(0.144)	(0.139)	(0.258)	(0.171)	(0.103)	(0.146)	(0.154)	(0.133)	(0.115)	(0.215)
dum0700	0.0750	0.0585	0.0107	0.0280	0.0227	0.0221	0 101	0.0405	0.0427	0.0057
uu119799	(0.0836)	(0.0977)	(0.161)	-0.0280 (0.114)	(0.0337)	(0.107)	(0.0996)	(0.0403)	(0.0427) (0.0779)	(0.0823)
	`	` ´	<u>`</u>		, , , , , , , , , , , , , , , , , , ,	*	` . . *	**	``` ``	```´`
_cons	0.482	0.707	0.174 (0.633)	0.463 (0.502)	0.194	0.994 (0.486)	1.079	1.802	0.835	-0.00719 (0.425)
N	75	75	75	75	75	75	75	75	75	75
adj. R^2	0.993	0.984	0.976	0.980		0.980	0.979		0.981	
Durbin's alternative test for autoco	orrelation									
chi2	1.909	0.003	0.773	1.365		1.824	0.887		1.227	
Prob > chi2	0.1670	0.9563	0.3792	0.2427		0.1769	0.3462		0.2680	

Table A.4b: Ravallion Regressions: Monthly Retail Price (Harvest Season) - Continued

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001^Newey-West HAC Standard Errors

	1 abic 14.10.		itegi essions	5. Wionemy	Retail 1110	e (Oli Seas	011)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	rphil	rmm	rcar	rreg1	rreg2^	rreg3	rreg4a	rreg4b	rreg5
Retail price, previous pd.	0.635***	0.544^{***}	0.547^{***}	0.922^{***}	0.546***	0.733***	0.896***	0.674^{***}	0.900^{***}
	(0.120)	(0.0946)	(0.0801)	(0.0734)	(0.121)	(0.0890)	(0.0693)	(0.0758)	(0.125)
Wholesale price, previous pd.	0.422**	0.451***	0.434***	0.0934	0.500***	0.266**	0.131	0.333***	0.203
	(0.126)	(0.0905)	(0.0838)	(0.0685)	(0.131)	(0.0933)	(0.0729)	(0.0790)	(0.135)
Change in wholesale price	1.000****	0.768***	0.878^{***}	1.086***	0.999***	1.007***	0.939***	0.786***	1.054***
	(0.0327)	(0.0710)	(0.0459)	(0.0501)	(0.0786)	(0.0342)	(0.0610)	(0.0304)	(0.0666)
dum9596	0.00278	0.152	0.616***	0.0638	0.00712	0.0513	0.0531	0.330**	0.108
	(0.0924)	(0.273)	(0.172)	(0.141)	(0.161)	(0.115)	(0.186)	(0.112)	(0.265)
dum9799	-0.0609	0.125	0.0130	-0.0293	-0.0684	0.103	0.00480	0.128	-0.287
	(0.0638)	(0.200)	(0.114)	(0.0996)	(0.0704)	(0.0807)	(0.136)	(0.0851)	(0.169)
cons	-0 394	0.863	0.893*	-0 139	-0 0789	0.418	-0 292	0 337	-1.514 (0.606)
_0013	(0.257)	(0.704)	(0.381)	(0.361)	(0.382)	(0.275)	(0.399)	(0.278)	(0.000) 76
N	76	76	76	76	76	76	76	76	0.972
adj. R^2	0.995	0.960	0.983	0.989		0.994	0.987	0.994	0.458
Durbin's alternative test for autoco	orrelation								
chi2	0.997	2.308	0.730	1.403		3.551	0.063	0.019	0.4985
Prob > chi2	0.3180	.1287	0.3929	0.2363		0.0595	0.8025	0.8894	

Table A.4c: Ravallion Regressions: Monthly Retail Price (Off Season)

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001^Newey-West HAC Standard Errors

1 4010		5.0	5101151 11201	1000	11100 (811				
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	rreg6	rreg7^	rreg8	rreg9	rreg10	rreg11	rreg12	rreg13	rarmm
Retail price, previous pd.	0.925^{***}	0.791***	0.428^{***}	0.686^{***}	0.561***	0.661***	0.462^{***}	0.651***	0.725^{***}
	(0.105)	(0.0698)	(0.0943)	(0.112)	(0.105)	(0.0961)	(0.103)	(0.126)	(0.0894)
Wholesale price, previous pd.	0.137	0.261**	0.525***	0.319**	0.486***	0.447***	0.597***	0.448**	0.281**
	(0.103)	(0.0763)	(0.0943)	(0.113)	(0.111)	(0.103)	(0.110)	(0.139)	(0.0933)
Change in wholesale price	1.064***	0.826***	1.151***	0.866***	0.893***	0.998***	0.788^{***}	0.953***	0.920***
C 1	(0.0608)	(0.101)	(0.0488)	(0.0552)	(0.0587)	(0.0367)	(0.0418)	(0.0389)	(0.0614)
dum9596	0.121	-0.190	0.412*	0.301*	0.0552	-0.310*	-0.306	-0.268	-0.0902
	(0.248)	(0.277)	(0.169)	(0.147)	(0.185)	(0.151)	(0.193)	(0.135)	(0.157)
dum9799	-0.0152	-0.147	0.128	-0.00608	-0.155	-0.298**	-0.243	-0.241*	-0.162
	(0.176)	(0.102)	(0.110)	(0.104)	(0.133)	(0.112)	(0.133)	(0.102)	(0.129)
cons	-0.776	-0.397	1.546***	0.307	-0.181	-1.311**	-0.115	-1.145**	0.320
—	(0.696)	(0.493)	(0.424)	(0.406)	(0.538)	(0.433)	(0.555)	(0.395)	(0.378)
N	76	76	76	76	76	76	76	76	76
adj. R^2	0.957		0.983	0.981	0.971	0.977	0.961	0.977	0.987
Durbin's alternative test for autocorre	elation								
chi2	2.282		0.005	0.121	2.680	0.300	0.099	0.189	1.445
Prob > chi2	0.1309		0.9458	0.7277	0.1016	0.5839	0.7531	0.6638	0.2293

Table A.4c: Ravallion Regressions: Monthly Retail Price (Off Season) - Continued

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001^Newey-West HAC Standard Errors

	Table A.5a: YSM Regressions: Monthly Farm, with Level of Procurement											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)				
	freg1ch	freg2ch	freg3ch	freg4ach	freg4bch	freg5ch	freg6ch	freg7ch				
time	-0.000708	0.000982	-0.000559	0.000270	0.000338	-0.000214	0.000688	-0.00214				
	(0.00156)	(0.00171)	(0.00185)	(0.00169)	(0.00196)	(0.00177)	(0.00171)	(0.00230)				
Procurement	0.00000342	0.0000133	-0.0000141	0.0000191	0.00000931	-0.0000344	0.00000902	-0.00403**				
	(0.0000273)	(0.0000232)	(0.0000156)	(0.0000160)	(0.0000186)	(0.0000388)	(0.0000252)	(0.00132)				
dumjan	0.702 ^{**}	0.615 [*]	0	0.842 ^{**}	0.233	0	0.462	0.491				
	(0.264)	(0.267)	(.)	(0.323)	(0.374)	(.)	(0.272)	(0.358)				
dumfeb	0.290	0.774 ^{**}	-0.0582	0.946 ^{**}	0.820 [*]	0.516	0.753 ^{**}	-0.227				
	(0.278)	(0.269)	(0.288)	(0.338)	(0.392)	(0.277)	(0.271)	(0.361)				
dummar	0.203	0.501	-0.371	0.352	0.136	-0.150	0.786^{**}	-0.198				
	(0.278)	(0.266)	(0.288)	(0.335)	(0.388)	(0.280)	(0.266)	(0.360)				
dumapr	0.206	0.534 [*]	-0.264	0.0859	0.571	0.227	0.841^{**}	0.289				
	(0.277)	(0.257)	(0.288)	(0.316)	(0.366)	(0.297)	(0.271)	(0.359)				
dummay	0.154	0.381	-0.112	0.873 ^{**}	0.596	0.357	0.671 [*]	0.145				
	(0.276)	(0.256)	(0.289)	(0.313)	(0.363)	(0.283)	(0.272)	(0.361)				
dumjun	0.105	0.482	0.0785	0.685 [*]	0.543	0.190	0.285	-0.383				
	(0.280)	(0.264)	(0.287)	(0.335)	(0.388)	(0.277)	(0.274)	(0.357)				
dumjul	0.163	0.384	-0.340	0.733 [*]	0.688	0.478	0.389	-0.746 [*]				
	(0.284)	(0.270)	(0.287)	(0.346)	(0.401)	(0.277)	(0.275)	(0.365)				
dumaug	0.454	0.0920	-0.155	0.487	0.318	0.0906	-0.307	-0.0700				
	(0.284)	(0.270)	(0.288)	(0.350)	(0.406)	(0.277)	(0.274)	(0.366)				
dumsep	-1.107***	-0.701**	-1.492***	-0.0120	-0.899 [*]	-0.981***	-1.316***	-1.101 ^{**}				
	(0.284)	(0.269)	(0.288)	(0.350)	(0.405)	(0.277)	(0.265)	(0.366)				
dumoct	-1.813***	-0.912***	-1.449***	-0.406	-0.489	-0.816 ^{**}	0	-0.978**				
	(0.261)	(0.257)	(0.288)	(0.305)	(0.353)	(0.282)	(.)	(0.359)				
dumnov	0	0	0.0321	0	0	0.282	0.722 ^{**}	-0.189				
	(.)	(.)	(0.299)	(.)	(.)	(0.285)	(0.256)	(0.349)				
dumdec	0.144	0.459	-0.00594	0.567 [*]	0.431	0.826 ^{**}	0.698 ^{**}	0				
	(0.240)	(0.256)	(0.297)	(0.272)	(0.316)	(0.279)	(0.261)	(.)				
dum90	0	0	0	0	0	0	0	0				
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)				
dum91	-0.601*	-0.0458	-0.238	-0.335	-0.193	-0.140	-0.151	0.132				
	(0.284)	(0.303)	(0.334)	(0.315)	(0.365)	(0.321)	(0.303)	(0.425)				
dum92	0.0924	0.160	0.138	0.0851	0.0360	0.0437	0.158	-0.0377				
	(0.275)	(0.294)	(0.324)	(0.305)	(0.353)	(0.313)	(0.295)	(0.401)				

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2

wonitoring and Eval				(4)	(5)	(6)	(7)	(8)
	(1) freglch	(2) freg2ch	(3) freg3ch	(4) freg4ach	(<i>J</i>) freg4bch	freg5ch	(/) freg6ch	(0) freg7ch
	negren	negzen	negsen	neg luch	negioen	negoen	negoen	negren
dum93	0.0513	0.389	0.173	0.152	0.214	0.0610	0.192	-0.169
	(0.270)	(0.291)	(0.322)	(0.297)	(0.344)	(0.307)	(0.297)	(0.398)
dum94	-0.232	0.0466	-0.130	-0.0478	0.0325	0.0515	0.171	-0.217
	(0.264)	(0.286)	(0.315)	(0.291)	(0.338)	(0.302)	(0.293)	(0.389)
dum95	0.333	0.639*	0.451	0.463	0.395	0.266	0.397	0.0546
	(0.261)	(0.283)	(0.308)	(0.289)	(0.334)	(0.296)	(0.286)	(0.382)
dum96	-0.322	-0.189	-0.331	-0.290	-0.0276	-0.0488	-0.117	-0.171
	(0.253)	(0.272)	(0.301)	(0.281)	(0.326)	(0.289)	(0.280)	(0.372)
dum97	-0.0467	0.163	0.0992	0.0873	0.0400	-0.0285	0.108	-0.132
	(0.251)	(0.271)	(0.299)	(0.277)	(0.322)	(0.287)	(0.276)	(0.369)
dum98	-0.0509	0.0945	-0.0267	-0.0628	-0.110	-0.0470	-0.00537	-0.156
	(0.252)	(0.271)	(0.297)	(0.277)	(0.321)	(0.285)	(0.273)	(0.367)
dum99	-0.128	-0.0483	-0.0000479	-0.0950	-0.0986	0.124	0.0183	0.168
	(0.251)	(0.273)	(0.299)	(0.280)	(0.324)	(0.309)	(0.266)	(0.363)
lum00	-0.0348	0.0368	0.177	-0.0374	0.0776	0.164	0.0471	-0.00358
	(0.261)	(0.274)	(0.307)	(0.282)	(0.327)	(0.301)	(0.267)	(0.364)
dum01	-0.128	0.0438	0.0624	-0.0946	0.00806	0.103	0.0000435	0.153
	(0.257)	(0.275)	(0.300)	(0.288)	(0.333)	(0.300)	(0.271)	(0.369)
dum02	0.0467	0.112	0.121	-0.0767	-0.0909	0.127	0.0922	0.127
	(0.258)	(0.275)	(0.304)	(0.293)	(0.340)	(0.298)	(0.275)	(0.375)
lum03	-0.0561	0.00518	0.0261	-0.0712	0.00114	0.0472	-0.0183	0.0622
	(0.272)	(0.281)	(0.310)	(0.296)	(0.343)	(0.300)	(0.282)	(0.383)
dum04	0.0207	0.0852	0.188	-0.104	-0.0220	0.161	0.0615	0.105
	(0.270)	(0.288)	(0.318)	(0.304)	(0.352)	(0.308)	(0.287)	(0.392)
dum05	0.111	0.0854	0.0962	-0.0134	0.0706	0.110	0.0201	0.145
	(0.277)	(0.296)	(0.326)	(0.307)	(0.356)	(0.314)	(0.295)	(0.402)
dum06	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
_cons	0.144	-0.458	0.358	-0.535	-0.361	-0.113	-0.502	0.557
	(0.331)	(0.331)	(0.337)	(0.377)	(0.437)	(0.319)	(0.349)	(0.450)
N N	203	203	203	203	203	203	203	203
adj. K ²	0.465	0.267	0.234	0.144	0.147	0.222	0.349	0.093
Durbin-Watson d-	2.040138	2.290893	2.3//124	2.32144	2.439047	2.555805	2./1869	2.456515

statistic

Standard errors in parentheses *p < 0.05, **p < 0.01, ***p < 0.001

	Table A.5a: YSI	M Regressions	: Monthly Fa	rm, with Leve	el of Procurem	nent - <i>Continu</i>	ed
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	freg8ch	freg9ch	freg10ch	freg11ch	freg12ch	freg13ch	farmmch
ime	0.000148	0.00152	0.000351	0.00116	0.000763	0.00116	0.00106
	(0.00245)	(0.00196)	(0.00159)	(0.00184)	(0.00151)	(0.00171)	(0.00217)
rocurement	-0.000230	0.0000544	-0.000129	0.0000313	0.00000645	-0.00886**	0.0000214
	(0.000367)	(0.000145)	(0.0000873)	(0.0000675)	(0.0000226)	(0.00333)	(0.000103)
umjan	0	0.438	0.0621	0	0.649**	0	0.286
	(.)	(0.306)	(0.244)	(.)	(0.238)	(.)	(0.360)
umfeb	0.0523	0.256	0.271	0.0432	0.543*	0.0867	0.0242
	(0.372)	(0.306)	(0.247)	(0.274)	(0.239)	(0.274)	(0.361)
ummar	0.225	0.0371	-0.0184	0.228	0.690**	-0.358	0.603
	(0.372)	(0.301)	(0.243)	(0.274)	(0.237)	(0.274)	(0.355)
umapr	0.0669	0.285	0.328	-0.288	0.906***	0.0148	0.367
	(0.392)	(0.300)	(0.234)	(0.275)	(0.238)	(0.278)	(0.362)
ummay	0.361	0.0828	0.0345	-0.214	0.609*	0.00883	0.265
	(0.382)	(0.307)	(0.233)	(0.274)	(0.239)	(0.274)	(0.363)
umjun	0.534	0.275	-0.134	-0.285	0.470	-0.167	0.212
	(0.372)	(0.311)	(0.234)	(0.274)	(0.238)	(0.274)	(0.365)
lumjul	0.0771	0.0406	0.0718	0.125	0.673**	0.312	0.431
	(0.371)	(0.312)	(0.244)	(0.274)	(0.240)	(0.274)	(0.365)
umaug	0.587	-0.594	-0.0280	-0.277	0.100	-0.360	-0.157
	(0.372)	(0.308)	(0.246)	(0.274)	(0.238)	(0.274)	(0.361)
lumsep	-0.203	-1.128****	-1.103***	-0.933***	-1.313****	-0.871**	-0.606
	(0.372)	(0.303)	(0.245)	(0.274)	(0.234)	(0.274)	(0.358)
lumoct	-0.398	-0.975**	-0.948***	-0.828**	0	-0.730**	0.102
	(0.372)	(0.291)	(0.234)	(0.284)	(.)	(0.274)	(0.342)
umnov	-0.209	0	0	-0.670 [*]	0.542*	-0.645*	0
	(0.376)	(.)	(.)	(0.287)	(0.223)	(0.277)	(.)
umdec	0.169	-0.104	0.138	-0.103	0.776***	-0.276	-0.121
	(0.373)	(0.291)	(0.234)	(0.278)	(0.226)	(0.274)	(0.345)
um90	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2

itoring and Evaluation of Agri	cultural Folicy multa	ators. Annex 2.2					
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	freg8ch	freg9ch	freg10ch	freg11ch	freg12ch	freg13ch	farmmch
dum91	-0.101	-0.0492	0.152	-0.0555	-0.192	-0.186	-0.108
	(0.443)	(0.350)	(0.275)	(0.318)	(0.270)	(0.318)	(0.406)
dum92	0.237	0.159	0.220	0.0979	0.192	0.0737	0.176
	(0.420)	(0.332)	(0.267)	(0.311)	(0.262)	(0.309)	(0.394)
dum93	-0.0302	0.285	0.0931	0.145	0.189	0.0973	0.00229
	(0.412)	(0.331)	(0.267)	(0.308)	(0.258)	(0.301)	(0.383)
dum94	0.115	0.233	0.259	0.145	0.139	0.00605	0.146
	(0.410)	(0.330)	(0.266)	(0.309)	(0.255)	(0.294)	(0.372)
dum95	0.223	0.273	0.225	0.406	0.383	0.292	0.269
	(0.405)	(0.322)	(0.261)	(0.302)	(0.249)	(0.288)	(0.365)
dum96	-0.242	-0.0136	-0.0620	-0.0599	-0.122	-0.236	-0.0241
	(0.395)	(0.312)	(0.253)	(0.290)	(0.242)	(0.284)	(0.359)
dum97	0.00605	0.285	0.0712	0.152	0.104	0.00320	0.0491
	(0, 390)	(0.310)	(0.250)	(0, 290)	(0.240)	(0.281)	(0.356)
1 au	10 11.5a. 1 5111	tegi costono. Mion	(IIII) I'al III, WILL		ocur cincine -	commuta	
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	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	freg8ch	freg9ch	freg10ch	freg11ch	freg12ch	freg13ch	farmmch
dum98	0.0879	-0.131	-0.0295	-0.0951	-0.108	-0.0966	-0.196
	(0.387)	(0.303)	(0.247)	(0.286)	(0.235)	(0.280)	(0.354)
dum99	-0.0658	0.0747	0.0638	0.0766	0.0101	-0.110	0.165
	(0.382)	(0.307)	(0.242)	(0.281)	(0.232)	(0.280)	(0.366)
dum00	-0.108	0.0450	0.249	-0.0615	-0.130	-0.0398	0.00623
	(0.384)	(0.304)	(0.251)	(0.283)	(0.243)	(0.282)	(0.393)
dum01	-0.0372	-0.0489	0.151	-0.0442	-0.0282	-0.0996	-0.152
	(0.388)	(0.307)	(0.252)	(0.287)	(0.236)	(0.285)	(0.363)
dum02	0.0875	0.0866	0.110	0.0474	0.0699	-0.0530	0.0373
	(0.394)	(0.312)	(0.251)	(0.290)	(0.240)	(0.290)	(0.367)
dum03	-0.0246	0.0353	0.143	0.00506	-0.00585	-0.0911	-0.0181
	(0.401)	(0.318)	(0.255)	(0.296)	(0.245)	(0.296)	(0.374)
dum04	-0.00465	-0.0597	-0.00772	0.0218	0.0394	0.250	-0.0181
	(0.411)	(0.326)	(0.261)	(0.303)	(0.251)	(0.330)	(0.383)
dum05	-0.0119	-0.0739	0.0642	-0.0965	-0.0746	-0.0466	-0.0929
	(0.422)	(0.335)	(0.268)	(0.311)	(0.258)	(0.318)	(0.394)
dum06	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)
cons	-0.124	-0.144	0.0198	0.0673	-0.520	0.155	-0.271
	(0.444)	(0.391)	(0.316)	(0.335)	(0.307)	(0.314)	(0.401)
N	203	203	203	203	203	203	203
adj. R^2	-0.054	0.172	0.226	0.072	0.402	0.107	-0.031
Durbin-Watson d-statistic	2.801014	2.50492	2.530034	2.516219	2.316282	2.495205	2.544482

Table A Say VSM Degregions	Monthly Form	with I aval of Draguramont	Continued
Table A.5a: TSIVI Regressions:	Monthly rarm,	, with Level of Frocurement	- Commuea

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

		NIT INGI US	Sionsi Quui	terry I al III,		. of i focule		(0)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fqreg1ch	fqreg2ch	fqreg3ch	fqreg4ach	fqreg4bch	fqreg5ch	fqreg6ch	fqreg7ch
time	-0.00187	0.00585	-0.000224	-0.00241	0.00385	0.00439	-0.00913	-0.0139
	(0.0136)	(0.0131)	(0.0131)	(0.0135)	(0.00994)	(0.0117)	(0.0113)	(0.0147)
	(((()	()	(((
Procurement	0.0000272	-0.00000904	0.00000823	0.0000182	0.0000404^{*}	-0.0000146	-0.0000501*	-0.00181
Tiocurement	(0.0000272)	(0.000000000)	(0.00000023)	(0.0000102)	(0.0000101)	(0.0000110)	(0.0000201)	(0.00101)
	(0.0000505)	(0.0000230)	(0.0000138)	(0.0000204)	(0.0000131)	(0.0000344)	(0.0000212)	(0.00109)
duma 1	0.785*	2 706***	2 454***	0.206	0.217	0.374	0.117	1 718***
uuniqi	0.785	2.700	2.434	(0.409)	-0.217	(0.374)	-0.117	(0, 402)
	(0.390)	(0.384)	(0.405)	(0.408)	(0.301)	(0.348)	(0.297)	(0.403)
	0.220	2 720***	2 011***	0.412	0.0541	0	0	1 047***
duniqz	0.559	2.750	2.011	-0.412	0.0341	0	0	1.04/
	(0.3/5)	(0.342)	(0.3/3)	(0.424)	(0.313)	(.)	(.)	(0.405)
d	0	1 715***	1 7(1***	0	0	0.09/5	1 005***	0.450
dumq3	0	1./15	1./01	0	0	-0.0865	-1.995	0.450
	(.)	(0.403)	(0.410)	(.)	(.)	(0.356)	(0.288)	(0.428)
d	2 9(2***	0	0	2 000**	2 020***	1 520***	1 022***	0
dumq4	-2.805	0	0	-2.099	-3.038	-1.558	-1.955	0
	(0.535)	(.)	(.)	(0./10)	(0.523)	(0.321)	(0.344)	(.)
dum00	0	0	0	0	0	0	0	0
dum90	0	0	0	0	0	0	0	
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
dum91	-1 453	0.0149	-1.028	-1 242	-0.854	-0.167	-0 999	-0 399
duiii) I	(0.812)	(0.722)	(0.760)	(0.929)	(0.617)	(0.680)	(0.625)	(0.850)
	(0.812)	(0.752)	(0.709)	(0.858)	(0.017)	(0.089)	(0.033)	(0.839)
dum92	0.00575	0.429	0 196	0 194	0.207	0 444	0 196	-0.226
dum/2	(0.770)	(0.711)	(0.748)	(0.805)	(0.502)	(0.670)	(0.618)	(0.821)
	(0.779)	(0.711)	(0.748)	(0.803)	(0.393)	(0.070)	(0.018)	(0.021)
dum03	0.367	0.916	0.603	0.407	0 706	0.656	-0.0920	-0.370
dum/5	(0.770)	(0.715)	(0.747)	(0.782)	(0.577)	(0.650)	(0.627)	(0.822)
	(0.770)	(0.713)	(0.747)	(0.783)	(0.577)	(0.002)	(0.037)	(0.823)
dum0/	-0.547	0.253	-0 291	-0.162	0.348	0 309	-0.220	-0.400
uum)4	(0.746)	(0.233)	(0.728)	(0.767)	(0.566)	(0.50)	(0.620)	(0.802)
	(0.740)	(0.703)	(0.728)	(0.707)	(0.300)	(0.030)	(0.029)	(0.803)
dum95	1.026	1 421*	1 216	1.051	1 851**	1 222	0.463	0 391
uuni) J	(0.729)	(0.602)	(0.700)	(0.765)	(0.564)	(0.622)	(0 609)	(0.795)
	(0.756)	(0.095)	(0.708)	(0.703)	(0.304)	(0.055)	(0.008)	(0.783)
dum96	-0.802	-0.469	-0.833	-0.611	-0.213	-0.283	-0.804	-0.437
uuiii70	-0.002	-0.407	-0.033	(0.721)	-0.215	-0.203	-0.004	(0.752)
	(0.704)	(0.000)	(0.085)	(0.731)	(0.339)	(0.011)	(0.388)	(0.752)

Table A 5h.	VSM Regressions	Ouarterly Farm	with Leve	of Procurement
1 abic 11.50.	I DIVI INCLI COSTUIIS.	Quality raim		I UI I I UCUI CHICHC

)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	fqreg1ch	fqreg2ch	fqreg3ch	fqreg4ach	fqreg4bch	fqreg5ch	fqreg6ch	fqreg7ch
dum97	-0.0458	0.403	0.396	0.284	0.251	0.297	-0.317	-0.263
	(0.694)	(0.646)	(0.676)	(0.715)	(0.527)	(0.603)	(0.574)	(0.740)
dum98	-0.0754	0.180	-0.128	-0.125	-0.143	0.0466	-0.459	-0.159
	(0.698)	(0.645)	(0.668)	(0.712)	(0.525)	(0.595)	(0.560)	(0.733)
dum99	-0.387	-0.0789	-0.302	-0.320	-0.364	0.0861	0.0559	0.0839
	(0.686)	(0.638)	(0.664)	(0.724)	(0.533)	(0.664)	(0.529)	(0.706)
dum00	-0.319	0.402	0.0192	0.0445	-0.0118	0.699	0.167	-0.00326
	(0.723)	(0.641)	(0.684)	(0.728)	(0.537)	(0.633)	(0.529)	(0.707)
dum01	-0.517	0.200	-0.0607	-0.201	-0.376	0.0833	0.0115	0.369
	(0.700)	(0.639)	(0.659)	(0.749)	(0.552)	(0.626)	(0.532)	(0.713)
dum02	0.0901	0.442	0.250	0.0156	-0.405	0.488	0.208	0.377
	(0.699)	(0.634)	(0.668)	(0.763)	(0.562)	(0.614)	(0.539)	(0.724)
dum03	-0.388	-0.0322	-0.000712	-0.172	-0.346	0.0734	0.242	0.229
	(0.745)	(0.645)	(0.679)	(0.761)	(0.561)	(0.610)	(0.551)	(0.737)
dum04	0.0102	0.114	0.264	-0.121	-0.310	0.402	0.242	0.303
	(0.728)	(0.660)	(0.695)	(0.783)	(0.577)	(0.627)	(0.561)	(0.753)
dum05	0.204	0.306	0.193	0.232	0.360	0.236	0.106	0.378
	(0.745)	(0.678)	(0.713)	(0.772)	(0.569)	(0.638)	(0.577)	(0.772)
dum06	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
cons	0.477	-2.266**	-1.705*	0.367	0.0680	-0.152	1.492*	-0.449
	(0.685)	(0.772)	(0.759)	(0.696)	(0.513)	(0.646)	(0.593)	(0.850)
N	67	67	67	67	67	67	67	67
adj. R^2	0.582	0.547	0.400	0.225	0.556	0.337	0.611	0.273
Durbin-Watson d-statistic	2.633364	2.423854	2.636594	2.826111	2.440906	2.828205	2.708325	2.728024

Table A.5b: YSM Regressions:	Ouarterly Farm.	with Level of Procuremen	t - Continued

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

TADIC A.JD.	I SWI Kegi es	sions. Quai	terry rarm,		orrocurci	1000 - 000	inueu
	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	fgreg8ch	fgreg9ch	fgreg10ch	fgreg11ch	fqreg12ch	fqreg13ch	fgarmmch
time	0.000311	0.00439	0.000815	0.0116	-0.000596	0.00471	0.00498
	(0.0122)	(0.0135)	(0.0111)	(0.0125)	(0.0108)	(0.0105)	(0.0122)
	(****==)	(0.0000)	(******)	(****=*)	(*******)	(000000)	(****==)
Procurement	-0.000279	-0.000144	-0.000150	0.0000624	-0.0000135	-0.00997**	0.0000307
1 local efficient	(0,000239)	(0,000120)	(0.0000756)	(0.00000021)	(0.0000196)	(0.00308)	(0.0000731)
	(0.000237)	(0.000120)	(0.0000750)	(0.00000004)	(0.0000170)	(0.00500)	(0.0000751)
dumal	-0.588	2 200***	1 744***	1 961***	-0.183	-0.315	-0.669
duniqi	(0.246)	(0.388)	(0.208)	(0.262)	(0.282)	(0.212)	(0.358)
	(0.340)	(0.388)	(0.508)	(0.302)	(0.285)	(0.512)	(0.558)
dum a2	0	2 212 ***	2 000***	1 700***	0	0	0
duniq2		2.213	2.008	1./02	0	0	0
	(.)	(0.401)	(0.277)	(0.558)	(.)	(.)	(.)
1	0.102	1 114**	1.047**	1 520***	1 20 4***	0.102	0 (7(
dumq3	0.183	1.114	1.04/	1.529	-1.284	-0.183	-0.6/6
	(0.357)	(0.407)	(0.314)	(0.3/3)	(0.2/7)	(0.306)	(0.350)
1 4	1 0 50**	0	0	0	0 1 50***	1 70 4***	1 400**
dumq4	-1.052	0	0	0	-2.152	-1./04	-1.409
	(0.323)	(.)	(.)	(.)	(0.334)	(0.300)	(0.409)
1	0	0	0	0	0	0	0
dum90	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)
dum01	0.0422	0.245	0.265	0.257	0.042	0.702	0.577
aumyr	-0.0452	0.243	0.203	-0.237	-0.942	-0.795	-0.377
	(0.695)	(0.760)	(0.597)	(0.693)	(0.629)	(0.645)	(0.764)
dum02	0.546	0.277	0.580	0.620	0.408	0.207	0.150
dum92	(0.65)	(0.277)	0.580	(0.030)	(0, (0.8))	$(0.20)^{\prime}$	(0.729)
	(0.005)	(0.727)	(0.586)	(0.081)	(0.008)	(0.624)	(0.738)
dum02	0.0242	0.729	0.220	0.250	0.240	0.00277	0.0944
dum95	-0.0343	(0.738)	0.550	(0.330)	(0.540)	-0.00277	-0.0844
	(0.655)	(0.738)	(0.393)	(0.677)	(0.600)	(0.005)	(0.715)
dum04	0.250	0.205	0.269	0.580	0.150	0.0000	0.250
aum94	(0.650)	(0.203)	0.508	(0.681)	(0.504)	-0.0808	(0.699)
	(0.659)	(0.738)	(0.598)	(0.081)	(0.594)	(0.588)	(0.088)
dum05	0.826	0.737	0.808	1 376*	0.874	0 701	0.455
uum ³ 3	(0.620)	(0.737)	0.000	1.370	(0.575)	(0.791)	(0.433)
	(0.049)	(0./10)	(0.582)	(0.000)	(0.5/5)	(0.5/4)	(0.071)
dum06	0.566	0.202	0.276	0.111	0.269	0.752	0.00072
aum96	-0.500	-0.393	-0.3/6	-0.111	-0.368	-0./52	0.009/3
	(0.626)	(0.681)	(0.556)	(0.626)	(0.551)	(0.563)	(0.658)

Table A.5b: YSM Regressions:	Ouarterly Farm	, with Level of Procurement	t - Continued

	Table A.5b. 15Wi Kegressions. Quarterry Farm, with Deveror Froedenent - Commuted							
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
	fgreg8ch	fgreg9ch	fgreg10ch	fgreg11ch	fgreg12ch	fgreg13ch	fgarmmch	
dum97	-0.00920	0.446	0.180	0.507	0.115	-0.0189	0.634	
	(0.613)	(0.674)	(0.547)	(0.624)	(0.542)	(0.554)	(0.648)	
	()	()	()	()	()		()	
dum98	0.334	-0.520	-0.227	-0.0977	-0.460	-0.434	-0.837	
	(0.603)	(0.649)	(0.535)	(0.609)	(0.525)	(0.549)	(0.642)	
dum99	-0.407	0.603	0.329	0.181	0.104	-0.261	0.118	
	(0.582)	(0.647)	(0.507)	(0.585)	(0.507)	(0.547)	(0.669)	
dum00	0 109	0.254	0.817	0.0223	-0.0148	-0.0505	0.0137	
dumoo	(0.583)	(0.637)	(0.527)	(0.588)	(0.533)	(0.548)	(0.732)	
	(0.505)	(0.057)	(0.527)	(0.200)	(0.555)	(0.5 10)	(0.752)	
dum01	-0.0625	-0.0289	0.389	-0.231	-0.0917	-0.302	-0.245	
	(0.585)	(0.642)	(0.526)	(0.593)	(0.511)	(0.552)	(0.653)	
	()	()	()	()	()		()	
dum02	0.224	0.170	0.321	0.193	0.276	-0.0467	-0.0860	
	(0.590)	(0.651)	(0.521)	(0.598)	(0.520)	(0.559)	(0.654)	
d	0.0104	0.20(0.544	0.15(0.0127	0.200	0 125	
dum03	0.0194	0.396	0.544	0.156	-0.013/	-0.206	0.135	
	(0.599)	(0.662)	(0.527)	(0.610)	(0.528)	(0.570)	(0.665)	
dum04	0.0671	-0.429	-0.0757	0.0589	0.157	1.003	0.169	
	(0.612)	(0.678)	(0.540)	(0.624)	(0.541)	(0.688)	(0.681)	
	· · · ·	× /	· · · · ·	· · · ·	· · · ·	· · · ·		
dum05	0.119	-0.0395	0.114	-0.157	0.00137	0.246	-0.450	
	(0.629)	(0.695)	(0.553)	(0.640)	(0.554)	(0.625)	(0.699)	
dum06	0	0	0	0	0	0	0	
duilloo	\mathbf{O}	()	0	0	0	0	0	
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	
cons	0 292	-1 633	-1 325	-2.069**	0.874	0.492	0 424	
_•••••	(0.713)	(0.824)	(0.661)	(0.761)	(0.560)	(0.532)	(0.626)	
Ν	67	67	67	67	67	67	67	
adj. R^2	0.146	0.469	0.496	0.291	0.557	0.416	0.039	
Durbin-Watson d-statistic	2.65257	2.52659	2.692067	2.805163	2.58955	2.629436	2.56271	

Table A.5b: YSM Re	gressions: Ouarterl	v Farm. with 🛾	Level of Procurement	- Continued

Standard errors in parentheses *p < 0.05, **p < 0.01, ***p < 0.001

	1 4010 1 100		5. 00010110.	munity	1		Distinut	
	(1)	(2) mag1ah∆	(3) mag2ah	(4) maa2ah∧	(5)	(6)	(7) maa5ah∧	(8) rrag6ab
	rmmen	negion	rreg2cn	rregson ~	nteg4acn^	nteg4bcn^	rregoen ~	rregoen
time	-0.000203	0.0005/8	0.00111	0.00111	0.0000124	0.000/61	0.00136	0.00051/
	(0.00156)	(0.000943)	(0.000887)	(0.00106)	(0.000904)	(0.000972)	(0.00123)	(0.00309)
Distribution	0.00000158	-0.0000292	-0.0000391	-0.0000208	-0.00000584	-0.0000196*	-0.0000296	0.0000250
	(0.00000460)	(0.0000155)	(0.0000390)	(0.0000139)	(0.0000830)	(0.0000865)	(0.0000263)	(0.0000292)
				*	· ···	**		
dumjan	0	-0.677	0	-1.053	-0.784	-1.125	-0.977	0
	(.)	(0.425)	(.)	(0.469)	(0.383)	(0.390)	(0.564)	(.)
dumfeb	-0.0412	-0.648	0.108	-0.767	-0.603	-0.712	-0.892	0.0803
	(0.171)	(0.418)	(0.131)	(0.470)	(0.374)	(0.386)	(0.578)	(0.133)
	()		()	()	(111)	()	()	()
dummar	0.0382	-0.539	0.166	-0.738	-0.517	-0.885*	-0.984	0.0483
	(0.173)	(0.409)	(0.136)	(0.460)	(0.366)	(0.376)	(0.555)	(0.112)
dumanr	0.0362	-0 354	0.303*	-0 799	-0 588	-0.851*	-1 114	0.306**
uumapi	(0.175)	(0.405)	(0.128)	(0.467)	(0.365)	(0.376)	(0.591)	(0.110)
	(0.175)	(0.405)	(0.120)	(0.407)	(0.505)	(0.570)	(0.591)	(0.110)
dummay	0.0633	-0.528	0.144	-0.880	-0.546	-0.658	-0.787	0.489^{**}
2	(0.181)	(0.380)	(0.141)	(0.452)	(0.351)	(0.363)	(0.562)	(0.158)
dumjun	-0.133	-0.548	0.158	-0.651	-0.489	-0.539	-0.869	0.0566
	(0.176)	(0.354)	(0.126)	(0.400)	(0.326)	(0.335)	(0.533)	(0.159)
dumiul	0.219	-0 384	0.613***	-0.521	-0 343	-0.403	-0.528	0 185
<i></i>	(0.225)	(0.323)	(0.182)	(0.353)	(0.304)	(0.310)	(0.473)	(0.222)
	(()	()	()	(111)	()	()	
dumaug	0.531	0	0.771	0	0	0	0	0.699
	(0.396)	(.)	(0.447)	(.)	(.)	(.)	(.)	(0.436)
dumsen	0 195	-0.276	0.424*	-0.351	-0.126	-0 519 [*]	-0.514	-0.946**
uumsep	(0.205)	(0.271)	(0.198)	(0.303)	(0.232)	(0.261)	(0.364)	(0.331)
	(0.203)	(0.271)	(0.190)	(0.505)	(0.252)	(0.201)	(0.504)	(0.551)
dumoct	0.179	-0.994*	-0.281	-0.965*	-0.566	-0.689*	-1.249*	-0.917***
	(0.231)	(0.390)	(0.159)	(0.426)	(0.323)	(0.334)	(0.542)	(0.200)
		**		**	· · · · · *	**	*	*
dumnov	-0.442	-1.301	-0.304	-1.313	-0.896	-1.211	-1.147	-0.271
	(0.462)	(0.435)	(0.196)	(0.489)	(0.403)	(0.392)	(0.548)	(0.131)
dumdec	-0.0185	-1.029*	0.0144	-0.928*	-0.825*	-0.957*	-0.912	0.0783
	(0.175)	(0.428)	(0.148)	(0.460)	(0.393)	(0.414)	(0.524)	(0.119)
	× /	~ /				× ,	· · · ·	
dum90	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
dum91	0.0316	-0 194	-0 0294	-0.245	-0.270	-0.231	-0 243	-0.0577
auni / I	(0 195)	(0.135)	(0.174)	(0.160)	(0.186)	(0.187)	(0.197)	(0.541)
	(0.190)	(0.155)	(0.171)	(0.100)	(0.100)	(0.107)	(0.177)	(0.011)
dum92	0.102	0.108	0.239	-0.0157	0.116	-0.0612	0.102	0.139
	(0.203)	(0.125)	(0.185)	(0.184)	(0.184)	(0.171)	(0.193)	(0.526)

Table A.5c: YSM Regressions: Monthly Retail, with Level of Distribution

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	rmmch	rregIch	rreg2ch	rreg3ch^	rreg4ach^	rreg4bch/	rreg5ch	rreg6ch
dum93	0.217	0.344*	0.307	0.256	0.142	0.216	0.235	0.273
	(0.171)	(0.149)	(0.201)	(0.220)	(0.187)	(0.165)	(0.206)	(0.535)
dum94	0.0664	-0.186	0.0151	-0.216	-0.128	-0.114	-0.0741	0.261
	(0.210)	(0.130)	(0.160)	(0.151)	(0.227)	(0.190)	(0.179)	(0.444)
dum95	0.322	0.506	0.530	0.302	0.332	0.281	0.454	0.569
	(0.881)	(0.516)	(0.472)	(0.485)	(0.570)	(0.538)	(0.778)	(0.719)
dum96	0.0960	0.0552	0.0418	-0.0177	0.00693	0.0178	-0.277	0.0488
	(0.189)	(0.204)	(0.227)	(0.215)	(0.225)	(0.242)	(0.215)	(0.386)

	Table A.5c: YSM	Regressions:	Monthly	Retail, with	Level of Dist	ribution - (Continued	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	rmmch	rreg1ch^	rreg2ch	rreg3ch^	rreg4ach^	rreg4bch^	rreg5ch^	rreg6ch
dum97	-0.0396	-0.0129	-0.0473	-0.190	-0.0638	-0.128	-0.0383	0.0976
	(0.159)	(0.158)	(0.125)	(0.133)	(0.186)	(0.130)	(0.166)	(0.346)
dum98	-0.119	0.0803	0.0748	0.146	-0.197	-0.0686	0.102	0.0334
	(0.115)	(0.117)	(0.123)	(0.173)	(0.232)	(0.116)	(0.242)	(0.323)
dum99	-0.00251	0.0692	0.0101	0.0110	-0.0575	0.00318	0.201	0.0228
	(0.136)	(0.105)	(0.104)	(0.122)	(0.119)	(0.111)	(0.279)	(0.298)
dum00	-0.0344	0.0513	0.134	-0.141	-0.0270	0.0368	0.102	0.0781
	(0.138)	(0.102)	(0.104)	(0.0963)	(0.145)	(0.120)	(0.139)	(0.245)
dum01	0.0197	-0.0876	0.0396	-0.144	0.00428	0.0688	-0.0883	0.0481
	(0.189)	(0.130)	(0.128)	(0.139)	(0.171)	(0.117)	(0.121)	(0.222)
dum02	0.206	0.229^{*}	0.171	-0.0440	0.0478	-0.00989	0.0410	0.000137
	(0.200)	(0.113)	(0.112)	(0.172)	(0.117)	(0.105)	(0.127)	(0.222)
dum03	0.00811	0.122	-0.0215	-0.124	-0.0975	-0.0494	-0.121	0.0306
	(0.163)	(0.0929)	(0.103)	(0.141)	(0.110)	(0.140)	(0.138)	(0.163)
dum04	-0.0319	0.142	-0.00736	-0.0673	-0.0992	0.00121	-0.0410	-0.0349
	(0.216)	(0.107)	(0.0905)	(0.123)	(0.113)	(0.157)	(0.136)	(0.186)
dum05	0	0.187	0.0763	0.0487	0.0296	0.107	0.105	0.191
	(.)	(0.102)	(0.0853)	(0.107)	(0.126)	(0.172)	(0.137)	(0.168)
dum06	-0.0207	0	0	0	0	0	0	0
	(0.133)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
cons	-0.133	0.591	-0.308	0.806	0.559	0.787	0.836	-0.223
_	(0.233)	(0.422)	(0.165)	(0.456)	(0.382)	(0.399)	(0.567)	(0.580)
Ν	203	203	203	203	203	203	203	203
adj. R ²	-0.034	0.145	0.155	0.127	0.047	0.109	0.078	0.232
	2.438547	1.909910	1.850123	1.971661	1.896760	1.939942	1.806706	2.499565

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001^Prais-Winsten AR(1) regression

Monitoring and Evaluation of	Agricultural Policy	y Indicators: Annex 2	.2
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Table A	Table A.5c: YSM Regressions: Monthly Retail, with Level of Distribution - Continued									
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)		
	rreg7ch	rreg8ch	rreg9ch^	rreg10ch^	rreg11ch	rreg12ch^	rreg13ch^	rarmmch		
time	0.000194	0.00222	0.000987	0.000619	0.000386	0.000516	0.00132	0.0000767		
	(0.00121)	(0.00116)	(0.000829)	(0.000988)	(0.00109)	(0.000849)	(0.00155)	(0.000861)		
1	0.0000207	0.0000005	0.000000000	0.0000304	0.00000000	0.0000146	0.0000616	0.0000252		
distreg/	-0.000030/	-0.0000925	-0.00000363	-0.0000384	-0.00000689	0.0000146	-0.0000616	-0.0000353		
	(0.000185)	(0.0000477)	(0.0000145)	(0.0000235)	(0.0000201)	(0.0000224)	(0.0000697)	(0.0000242)		
dumjan	0	0.623**	-0.243	-0.681*	0	0	0	-0.256		
-	(.)	(0.227)	(0.168)	(0.269)	(.)	(.)	(.)	(0.175)		
dumfeh	0.252	0 577***	-0.285*	-0.633*	0.00959	0 303**	0.136	-0.258		
uumiee	(0.153)	(0.141)	(0.144)	(0.271)	(0.123)	(0.112)	(0.139)	(0.173)		
	(0.155)	(0.141)	(0.144)	(0.271)	(0.125)	(0.112)	(0.15))	(0.175)		
dummar	0.180	0.410^{**}	-0.389**	-0.668*	-0.00441	0.291^{*}	-0.0200	-0.289*		
	(0.189)	(0.137)	(0.142)	(0.257)	(0.146)	(0.125)	(0.182)	(0.145)		
	. ,		~ /		~ /	. ,	× ,	× /		
dumapr	0.273	0	-0.221	-0.639*	0.0263	0.223	-0.133	-0.253		
	(0.197)	(.)	(0.140)	(0.251)	(0.148)	(0.140)	(0.157)	(0.180)		
dummav	0.512**	0.356***	-0.159	-0.467	0.0823	0.457***	0.0195	0.0765		
<i></i>	(0.158)	(0.0907)	(0.134)	(0.246)	(0.142)	(0.136)	(0.148)	(0.206)		
	(00000)	((((())))))	(0.000)	(0.2.00)	(000 02)	(00000)	(00000)	(0.200)		
dumjun	0.359	0.556^{***}	-0.271*	-0.554*	0.0510	0.197	-0.0547	-0.257		
	(0.187)	(0.115)	(0.116)	(0.245)	(0.147)	(0.133)	(0.148)	(0.139)		
dumiul	0.690**	0.983***	0	-0.203	0.608**	0.500*	0 303	0		
adilijai	(0.251)	(0.180)	ů	(0.203)	(0.224)	(0.202)	(0.188)	ů		
	(0.201)	(0.100)	(.)	(0.227)	(0.221)	(0.202)	(0.100)	(.)		
dumaug	0.783^{*}	1.503**	0.0402	0	0.581	0.426^{*}	0.578^{*}	0.122		
•	(0.391)	(0.551)	(0.164)	(.)	(0.328)	(0.181)	(0.287)	(0.189)		
dumcon	0.616**	0 792**	0.502***	0.620**	0.221	0.411*	0.169	0.101		
dumsep	0.010	0.783	-0.595	-0.039	-0.331	-0.411	0.108	-0.191		
	(0.206)	(0.270)	(0.152)	(0.236)	(0.176)	(0.159)	(0.235)	(0.152)		
dumoct	-0.187	0.325	-0.915***	-1.433***	-1.097***	-0.585***	-0.595**	-0.422*		
	(0.209)	(0.236)	(0.161)	(0.300)	(0.176)	(0.149)	(0.193)	(0.198)		
			***	***	***	. ,	*	***		
dumnov	0.0922	-0.00458	-0.597	-1.030	-0.494	-0.265	-0.436	-0.585		
	(0.171)	(0.184)	(0.161)	(0.274)	(0.121)	(0.143)	(0.172)	(0.166)		
dumdec	0.271	0.358*	-0.512**	-0.691**	-0.0530	0.127	-0.0381	-0.575**		
	(0.139)	(0.170)	(0.155)	(0.261)	(0.155)	(0.115)	(0.136)	(0.174)		
1 00	0	0	0	0	0	0	0	0		
dum90	0	0	0	0	0	0	0	0		
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)		
dum91	-0.670*	-0.199	-0.0480	-0.360	-0.231	-0.195	0	-0.352		
	(0.320)	(0.229)	(0.197)	(0.238)	(0.178)	(0.188)	(.)	(0.187)		
1 02	0.1/0	0.00172	0.1/0	0.124	0.110	0.150	0	0.101		
aum92	-0.169	0.001/2	0.160	0.134	0.110	0.159	U	0.101		
	(0.255)	(0.269)	(0.214)	(0.182)	(0.201)	(0.182)	(.)	(0.175)		

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	rreg7ch	rreg8ch	rreg9ch^	rreg10ch^	rregllch	rreg12ch^	rreg13ch^	rarmmch
dum93	-0.0877	0.189	0.164	-0.0510	0.0810	0.149	0	-0.0278
	(0.233)	(0.198)	(0.174)	(0.180)	(0.241)	(0.172)	(.)	(0.126)
dum94	-0.114	-0.157	0.201	0.0194	0.159	0.160	0	0.0287
	(0.271)	(0.251)	(0.233)	(0.188)	(0.168)	(0.170)	(.)	(0.180)
dum95	0.262	0.138	0.283	0.183	0.315	0.299	0.192	0.319
	(0.423)	(0.461)	(0.277)	(0.352)	(0.265)	(0.197)	(0.246)	(0.309)
dum96	-0.407	-0.00545	0.0814	-0.0370	-0.115	-0.101	-0.0822	-0.132
	(0.297)	(0.302)	(0.237)	(0.215)	(0.140)	(0.159)	(0.210)	(0.189)

	Table A.5c: Y	SM Regres	sions: Mon	thly Retail,	with Leve	l of Distribu	tion - <i>Continu</i>	ed
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	rreg7ch	rreg8ch	rreg9ch^	rreg10ch^	rreg11ch	rreg12ch^	rreg13ch^	rarmmch
dum97	-0.270	-0.0108	-0.0146	-0.0775	-0.0409	0.0451	-0.0700	0.0225
	(0.159)	(0.180)	(0.115)	(0.131)	(0.148)	(0.189)	(0.215)	(0.137)
dum98	-0.0371	0.169	-0.0291	0.00218	-0.0616	-0.146	-0.136	-0.0712
	(0.134)	(0.175)	(0.121)	(0.145)	(0.132)	(0.171)	(0.164)	(0.131)
dum99	-0.137	-0.113	0.00469	0.0464	-	0.00360	0	-0.0764
					0.00333			
	(0.130)	(0.173)	(0.148)	(0.156)	(0.141)	(0.125)	(.)	(0.122)
dum00	-0.0893	0.127	-0.0417	-0.0496	-0.0379	-0.0682	0	0.0450
	(0.164)	(0.113)	(0.132)	(0.135)	(0.123)	(0.127)	(.)	(0.122)
dum01	-0.0601	-0.188	-0.0341	-0.0467	-0.0660	-0.0282	-0.178	-0.145
	(0.115)	(0.163)	(0.106)	(0.132)	(0.146)	(0.117)	(0.207)	(0.117)
dum02	-0.0902	-0.0216	0.0407	0.0609	0.00923	0.0358	-0.0796	0.0125
	(0.138)	(0.173)	(0.0988)	(0.118)	(0.305)	(0.170)	(0.225)	(0.105)
dum03	-0.0541	-0.0325	-0.0533	-0.000488	-0.0181	-0.0394	-0.0345	-0.00368
	(0.104)	(0.0989)	(0.107)	(0.162)	(0.168)	(0.134)	(0.144)	(0.119)
dum04	-0.0870	-0.0123	0.0293	-0.103	0.0939	0.0260	0.154	-0.0371
	(0.0988)	(0.122)	(0.107)	(0.132)	(0.181)	(0.188)	(0.137)	(0.199)
dum05	0.219	0.0773	0.0151	0.0212	0.0419	-0.0499	0.0289	0.0339
	(0.163)	(0.125)	(0.111)	(0.147)	(0.160)	(0.179)	(0.121)	(0.122)
dum06	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
_cons	-0.120	-0.396*	0.194	0.698^{*}	0.0117	-0.226	-0.0844	0.280
	(0.237)	(0.185)	(0.227)	(0.297)	(0.161)	(0.150)	(0.206)	(0.170)
N	203	203	203	203	203	203	131	203
adj. R ²	0.093	0.160	0.227	0.252	0.362	0.353	0.219	0.128
	2.12804	1.994307	1.949283	1.951732	1.90845	1.980009	1.914901	2.102311

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2 **—** 11

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001^Prais-Winsten AR(1) regression

-	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	rqmmch	rqreg1ch	rqreg2ch	rqreg3ch	rqreg4ach	rqreg4bch	rqreg5ch	rqreg6ch
time	0.00688	0.00747	0.00427	0.0154	0.00120	0.00272	0.00431	0.00512
	(0.0169)	(0.00522)	(0.00852)	(0.0135)	(0.00959)	(0.00822)	(0.00793)	(0.0177)
Distribution	-0.00000194	-0.0000293	0 000000947	-0.0000274	-0.0000191	-0.0000168	-0.00000411	0.0000379
Distribution	(0.00000608)	(0.0000182)	(0.0000444)	(0.0000202)	(0.0000160)	(0.0000159)	(0.0000191)	(0.0000234)
	()	(()	(((,	((
dumq1	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
duma2	0 534	0 917**	0.541*	0.559*	0 549	0.867^{**}	0 181	0.600
	(0.396)	(0.272)	(0.253)	(0.264)	(0.296)	(0.268)	(0.232)	(0.298)
	*							
dumq3	1.319	1.247	0.743	1.834	1.599	1.747	0.855	-0.789
	(0.649)	(0.703)	(0.737)	(1.022)	(0.961)	(0.926)	(0.592)	(0.471)
duma4	-0.274	-0.478	-0.441	-0.0411	0.269	0.0353	-0.148	-1.110^{**}
	(0.499)	(0.383)	(0.366)	(0.368)	(0.345)	(0.383)	(0.312)	(0.404)
dum90	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
dum91	-0.383	-0.757	-0.167	-0.884	-1.268	-0.936	-0.734	0.0493
	(0.476)	(0.606)	(0.563)	(0.636)	(0.744)	(0.513)	(0.456)	(1.211)
dum92	-0.615	0.0310	0 303	-0 118	-0.203	-0 273	0.326	-0 00249
duii)2	(0.801)	(0.455)	(0.630)	(0.621)	(0.632)	(0.591)	(0.550)	(1.142)
	(0.000)	(0.000)	(0.0000)	(****=*)	(0000-)	(0.03-2)	(0.000)	()
dum93	0.779^{*}	1.156***	0.758	0.688	0.323	0.527	0.990	0.937
	(0.322)	(0.297)	(0.384)	(0.591)	(0.550)	(0.422)	(0.499)	(1.194)
dum94	-0 393	-0.483	0 480	-0.863	-0 597	-0.306	0.000983	0.854
uuiii) i	(0.912)	(0.350)	(0.363)	(0.612)	(0.605)	(0.497)	(0.463)	(0.890)
	(0.312)	(0.500)	(0.000)	(0.012)	(0.000)	(0.157)	(0.102)	(0.0) 0)
dum95	0.835	1.194	1.603	0.616	0.979	1.121	1.502	1.783
	(2.050)	(1.724)	(1.535)	(1.835)	(1.856)	(2.034)	(1.415)	(1.255)
dum96	-0.473	0 334	0 307	-0 121	-0.484	-0.276	-0.443	0.283
uuiii)0	(1 159)	(0.870)	(0.940)	(0.773)	(0.678)	(0.518)	(0.739)	(1.005)
	(1.10))	(0.070)	(0.210)	(0.775)	(0.070)	(0.510)	(0.757)	(1.005)

Table A.5d:	YSM Regressions:	Quarterly Retail	, with Level of Distrib	ution

	I able A.St	1. I SWI Kegie	ssions. Quart	city icetall, w	ILL LEVEL OF D	151110011011 - C	ommueu	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	rgmmch	rgreg1ch	rgreg2ch	rgreg3ch	rgreg4ach	rgreg4bch	rgreg5ch	rgreg6ch
dum97	0.0570	-0.249	0.0165	-0.502	-0.519	-0.105	0.0613	0.422
	(0.577)	(0.369)	(0.230)	(0.448)	(0.396)	(0.332)	(0.206)	(0.725)
	()	()	(()	(()	()	()
dum98	-0.342	0.0726	0.268	0.663	-0.104	-0.0358	0.107	0.0851
	(0.455)	(0.226)	(0.372)	(0.736)	(0.602)	(0.457)	(0.482)	(0.721)
	()	()		()	()	()	()	()
dum99	-0.235	0.183	-0.0198	0.0346	-0.0922	0.0642	-0.0294	0.0596
	(0.532)	(0.355)	(0.330)	(0.456)	(0.325)	(0.347)	(0.634)	(0.636)
						× /	· · · ·	
dum00	-0.303	0.104	0.348	-0.394	0.0491	0.266	0.299	0.499
	(0.474)	(0.245)	(0.369)	(0.316)	(0.306)	(0.418)	(0.323)	(0.608)
dum01	-0.438	-0.241	0.236	-0.588	0.0654	0.105	-0.0736	0.186
	(0.687)	(0.521)	(0.310)	(0.496)	(0.342)	(0.346)	(0.233)	(0.560)
dum02	-0.00541	0.476	0.509	-0.146	0.0509	0.208	0.236	0.0523
	(0.467)	(0.361)	(0.374)	(0.300)	(0.249)	(0.268)	(0.228)	(0.559)
dum03	-0.380	0.283	0.0458	-0.495	-0.0231	-0.0256	-0.0421	0.205
	(0.630)	(0.204)	(0.288)	(0.466)	(0.343)	(0.465)	(0.289)	(0.498)
dum04	-0.539	0.469	0.113	-0.520	-0.0815	0.0747	0.0289	-0.0626
	(0.873)	(0.255)	(0.355)	(0.316)	(0.270)	(0.495)	(0.317)	(0.642)
		The second se						
dum05	0	0.449^{+}	0.502	0.0333	0.299	0.490	0.423	0.329
	(.)	(0.177)	(0.416)	(0.341)	(0.425)	(0.522)	(0.455)	(0.732)
1 07	0.000	0	0	0	0	0	0	0
dum06	-0.222	0	0	0	0	0	0	0
	(0.454)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
	0.425	0.479	0.772	0.271	0.150	0.441	0.529	0.505
_cons	-0.435	-0.4/8	-0.7/3	-0.5/1	-0.150	-0.441	-0.538	-0.395
M	(0.451)	(0.357)	(0.397)	(0.570)	(0.388)	(0.450)	(0.323)	(1.0/1)
N	0/	0/ 0.127	0/	0/025	0/	0/	0/	0/0.102
auj. K Durhin Watson I	-0.031	0.127	0.049	0.035	-0.015	0.030	0.094	0.193
otatistia	2.819302	2.90338/	5.005074	2.931014	2.940240	2.938913	2.15/092	2.321930
Statistic								

Table A.5d: YSM Regressions:	Ouarterly Retail. with Level of Distribution – <i>Continu</i>	led
	Quarterry rectany with Develor Distribution Continu	icu

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001

	I uble I lieur	I SIVI Regies	nonsi Quui u	any neurity w		Jisti ibution	continued	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	rgreg7ch	rgreg8ch	rgreg9ch	rgreg10ch	rgreg11ch	rgreg12ch	rgreg13ch	rgarmmch
time	0.00628	0 01 14	0.00271	-0 00444	0.000613	0.00753	0.0163	-0.000923
	(0.0127)	(0, 0110)	(0.0190)	(0.00660)	(0,0100)	(0.00849)	(0.0135)	(0.0100)
	(0.0127)	(0.0110)	(0.01)0)	(0.00000)	(0.0100)	(0.0001))	(0.0155)	(0.0100)
Distribution	-0.0000386	-0.0000224	0.0000/01	0.00000860	0.00000208	0 0000/90	-0.000693	-0.0000351
Distribution	-0.0000380	(0,0000224)	(0.0000491)	(0,000000000)	(0.00000208)	(0,0000490)	(0,0000093)	-0.0000331
	(0.0000199)	(0.0000334)	(0.0000330)	(0.0000284)	(0.0000248)	(0.0000550)	(0.0000737)	(0.0000508)
duma 1	0	0.0650	0	0	1 772***	0.911*	0.622*	0.227
uunqi	0	-0.0039	0	0	(0.249)	0.011	0.025	(0.327)
	(.)	(0.280)	(.)	(.)	(0.348)	(0.346)	(0.279)	(0.363)
duma)	0.014*	0	0.0692	0.440	1 501***	1 116***	0.502*	0.001*
duniqz	0.914	0	-0.0085	0.440	1.364	1.440	0.392	0.881
	(0.446)	(.)	(0.475)	(0.287)	(0.389)	(0.340)	(0.225)	(0.362)
d	1 207	1 171	0.795	0.200	1 207*	0.190	1 225***	1 005**
dumq3	1.380	1.1/1	0.785	0.300	1.50/	0.189	1.235	1.095
	(0.711)	(0.652)	(1.095)	(0.463)	(0.618)	(0.467)	(0.330)	(0.398)
dumal	0.170	0.432	1 022	0.603	0	0	0	0
uunq+	(0.1/0)	(0.77)	(1, 296)	(0.246)	0	()	0	()
	(0.400)	(0.377)	(1.380)	(0.540)	(.)	(.)	(.)	(.)
dum90	0	0	0	0	0	0	0	0
uuiii) o	Û	Ň	Õ	Õ	Ň	Ň	Ň	Ň
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
dum91	-1 823*	-0 337	0 203	-0.853	-0 679	0.0664	-0.527	-1 171
uuiii) i	(0.809)	(0.699)	(1.412)	(0,724)	(0.872)	(0,721)	(0.626)	(0.619)
	(0.007)	(0.077)	(1.112)	(0.721)	(0.072)	(0.721)	(0.020)	(0.017)
dum92	-0.897	0.295	0.445	-0.273	-0.0658	0.440	0.416	-0.186
	(1, 300)	(1.046)	(8 384)	(0.839)	(0.807)	(1.009)	(0.624)	(0.839)
	(1.500)	(1.010)	(0.501)	(0.057)	(0.007)	(1.00))	(0.021)	(0.057)
dum93	-0.220	0.614	0.844	0 222	0.301	0.647	0.0979	-0.135
uuni) 5	(0.682)	(0.572)	(1.043)	(0.443)	(0.405)	(0.440)	(0.460)	(0.479)
	(0.002)	(0.572)	(1.015)	(0.115)	(0.105)	(0.110)	(0.100)	(0.17)
dum94	-0 247	0.242	1.076	0.111	0.321	0.954	0.307	-0.0484
duilly 1	(0.725)	(0.609)	(1.088)	(0.678)	(0.447)	(0.667)	(0.528)	(0.645)
	(0.725)	(0.00))	(1.000)	(0.070)	(0.117)	(0.007)	(0.520)	(0.045)
dum95	0 489	1 187	1 674	0 968	1.052	1 434	0.505	0.839
dumpo	(1.673)	(1.609)	(1, 140)	(0.955)	(0.013)	(0.875)	(0.587)	(1.044)
	(1.075)	(1.007)	(1.140)	(0.755)	(0.715)	(0.075)	(0.507)	(1.0++)
dum96	-0 545	0.218	0 641	-0.0269	-0 184	0 190	-0.110	-0.158
autity 0	(0.971)	(0.850)	(1.369)	(0.840)	(0.580)	(0.633)	(0.703)	(0.906)
	(0.7/1)	(0.050)	(1.507)	(0.0+0)	(0.500)	(0.055)	(0.705)	(0.700)

Table A.5d: YSM Regressions: (Duarterly Retail	with Level of Distribution – <i>Continued</i>
Tuble field, Total field essions.	Zuur terry return	

	I ubie I lioui	i biti negi ebi	Joinst Quality	ing needan, m		- 1501 18 u 01011	commuted	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	rgreg7ch	rgreg8ch	rareg9ch	rgreg10ch	rgreg11ch	rgreg12ch	rgreg13ch	rgarmmch
dum97	-0.614	0.0358	0 290	-0.0784	0.0146	0 363	-0.335	0.0134
duniy ((0.450)	(0.460)	(0.854)	(0.235)	(0.385)	(0.454)	(0.506)	(0.361)
	(0.150)	(0.100)	(0.051)	(0.255)	(0.505)	(0.151)	(0.500)	(0.501)
dum98	-0.0675	0.253	-0.341	-0.320	-0.309	-0.489	-0.400	-0.245
	(0.411)	(0.468)	(0.883)	(0.364)	(0, 340)	(0.430)	(0.445)	(0.443)
	(0.11)	(0.100)	(0.002)	(0.501)	(0.5.10)	(0.150)	(0.110)	(0.1.2)
dum99	-0.142	-0.102	-0.0488	-0.272	-0.156	0.0380	-0.446	-0.233
	(0.685)	(0.484)	(0.900)	(0.547)	(0.395)	(0, 339)	(0.494)	(0.370)
	(0.000)	(0.101)	(0.500)	(0.0 17)	(0.590)	(0.555)	(0.191)	(0.570)
dum00	-0.0254	0.182	0.0379	-0.0989	0.0961	0.0284	-0.317	-0.0840
	(0.654)	(0.457)	(0.796)	(0.392)	(0.517)	(0.402)	(0.555)	(0.567)
	(0.000))	((()))	((())))	((((((((((((((((((((((((((((((((((((((((0.000)	(****=)	(0.000)	(0.000)
dum01	-0.279	-0.141	0.0853	-0.160	-0.200	0.0908	-0.643	-0.367
	(0.379)	(0.548)	(0.907)	(0.376)	(0.488)	(0.562)	(0.621)	(0.369)
	(0.0.77)	(0.0.10)	(((), ()))	(0.0.0)	(0000)	(0.000)	(0.02-7)	(0.00)
dum02	0.00971	0.111	0.125	0.317	0.206	0.248	-0.502	-0.00681
	(0.293)	(0.376)	(0.776)	(0, 379)	(0.521)	(0.486)	(0.690)	(0.321)
	(0.2)0)	(0.070)	(0.770)	(0.07)	(0.021)	(0.100)	(0.0)0)	(0.021)
dum03	-0.243	-0.0125	0.284	0.00907	0.00245	0.290	-0.0393	-0.0750
	(0.361)	(0.366)	(0.958)	(0.293)	(0.676)	(0.630)	(0.265)	(0.371)
	()	(()	()	()	()	()	()
dum04	-0.0866	0.0224	0.0276	0.0127	0.278	0.244	0.132	0.0412
	(0.275)	(0.466)	(0.794)	(0.268)	(0.625)	(0.740)	(0.472)	(0.367)
	(0.2,0)	(0000)		(0.200)	(0.020)	(000 00)	(****=)	(0.000)
dum05	0.865	0.0582	-0.00300	0.218	-0.0357	0.109	0.130	-0.0421
	(0.478)	(0.445)	(0.954)	(0.393)	(0.524)	(0.805)	(0.346)	(0.342)
	()		(()	(***)	()	()	(112)
dum06	0	0	0	0	0	0	0	0
	(.)	(.)	(.)	(.)	(.)	(.)	(.)	(.)
						~ /		
cons	-0.166	-0.506	-0.663	-0.0284	-1.198***	-1.521***	-0.978**	-0.369
	(0.752)	(0.566)	(1.374)	(0.354)	(0.232)	(0.368)	(0.358)	(0.562)
N	67	67	67	67	67	67	67	67
adi. R^2	-0.057	0.022	-0.273	0.054	0.200	0.174	0.107	0.059
Durbin-Watson	2.657281	2.96879	2.969141	2.815614	2.671165	2.66576	2.578591	2.65297
d-statistic								

Table A.5d: YSM Regressions: Quarterly Retail, with Level of Distribution - Continued

Standard errors in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001







Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2



Figure 2: Average Deflated Farm Gate Prices, by Region, 1990-2008

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2



Figure 3: Average Deflated Wholesale Prices, by Region, 1990-2008

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2



Figure 4: Average Deflated Retail Prices, by Region, 1990-2008



Figure 5: Monthly Deflated Farm Gate Price Movement, 1990-2008



Figure 6: Monthly Deflated Wholesale Price Movement, 1990-2008

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2



Figure 7: Monthly Deflated Retail Price Movement, 1990-2008



Figure 8: Regional Wholesale Prices as a Ratio of Manila Wholesale Prices, 1990-2008



Figure 9: Farm Gate Prices to Wholesale Prices Ratio (Deflated Prices), by Region, 1990-2008

Monitoring and Evaluation of Agricultural Policy Indicators: Annex 2.2



Figure 10: Wholesale Prices to Retail Prices Ratio (Deflated Prices), by Region, 1990-2008



Figure 11: Farm Gate Prices to Retail Prices (Deflated Prices), by Region, 1990-2008



Figure 13: Regional Farm Price Ratio and NFA Procurement Ratio



Figure 13: Regional Farm Price Ratio and NFA Procurement Ratio – Continued



Figure 13: Regional Farm Price Ratio and NFA Procurement Ratio – Continued



Figure 13: Regional Farm Price Ratio and NFA Procurement Ratio - Continued



Figure 14: Regional Retail Price Ratio and NFA Distribution Bias



Figure 14: Regional Retail Price Ratio and NFA Distribution Bias - Continued



Figure 14: Regional Retail Price Ratio and NFA Distribution Bias - Continued



Figure 14: Regional Retail Price Ratio and NFA Distribution Bias - Continued



ANNEX 3: IRRIGATION

Over the whole study period, irrigation development accounted for around 40 percent of total public expenditures for the sector. The National Irrigation Administration (NIA), the government corporation given the mandate, financial resources, and flexibility for undertaking irrigation development, administers at least 95 percent of that expenditure. The Bureau of Soils and Water Management for small water impounding projects and other units of the Department of Agriculture for the distribution of shallow tube well pumps spend the small remaining budgetary allocation¹. Nearly all of the budgetary allocations for irrigation development have been spent for gravity systems suitable mainly for rice cultivation.

1. Distribution of irrigation expenditures

At the NIA, irrigation investments or budgetary outlays for new construction, rehabilitation, and repairs of irrigation systems constitute 84 percent of total public expenditures for irrigation; while the remainder supports corporate expenditures for the operations of the central and regional offices, as well as the operation and maintenance (O&M) of the national irrigation systems or NIS (Figure A3.1). Collections of irrigation service fees of the NIS, amortization payments for CIS, management fee collected for the management of construction projects, and other miscellaneous sources fund the corporate expenditures. Foreign-assisted loan projects account for about 75 percent of irrigation investments, and the other 25 percent are locally funded projects². Corporate expenditures are financed from irrigation service fee collections, amortization payments for communal pump irrigation projects, equipment rentals, and other sources.

The government's budgetary resources have been primarily spent for the development and operations of national irrigation systems (NIS) which are medium and large-scale mostly gravity irrigation systems ranging from 1,000 to 100,000 hectares in size. Over the whole study period, the construction, rehabilitation, and repairs of national irrigation systems accounted for approximately 85 percent of irrigation investments (Fig. 13). Service area of NIS tripled from 218,000 hectares in 1965 to 660,000 hectares in 1990, but has grown very slowly to 750,000 hectares since then.
The NIA also assists in the planning and construction of communal irrigation systems (CIS), which are farmer-owned run-of-the-river gravity irrigation schemes with service areas below 1,000 hectares. Farmer-beneficiaries participate in their planning and construction, contribute about 10 percent of construction cost and amortize the remaining costs financed by the government for a period not exceeding 50 years without any interest, and immediately take over the operation and maintenance. Allocations for CIS have averaged only 12 percent of irrigation investments; and expenditures for small water impounding and shallow tube well projects accounted for the remaining three percent. Not surprisingly, the service area of CIS which in 1965 was estimated to be nearly 400,000 hectares expanded only by 50,000 hectares up to the early 1990s. By 2008, the service area of CIS (550,000 hectares) was significantly less than the service area of NIS. The integration of some CIS into newly constructed and larger NIS partly explains the declining importance of communal irrigation systems.

Up to the mid-1980s, nearly all (95%) of irrigation investments were spent for NIS. The share of CIS in irrigation investments began to increase by the mid-1980s from an average of less than 5 percent in the 1970s, up to more than 40 percent in the mid-1990s. The greater attention to CIS occurred as the government allocated a large portion of the Agrarian Reform Fund of the CARP for support services to beneficiaries and donor agencies focused on poverty reduction as their overriding goal.

By the late 1990s, the bulk of irrigation investments (over 80% on the average and up to 90% in 2007 and 2008) again focused on NIS. This is notwithstanding the passage of the AFMA in 1998, which directed public support for irrigation to be re-oriented toward small-scale gravity systems such as the CIS, rehabilitation and irrigation management transfer to irrigators' associations of NIS, and development of groundwater resources. There was indeed an increased emphasis in rehabilitation for the NIS since the late 1980s, but over the past decade, some large-scale irrigation projects have been funded again, despite concerns about their economic merits and environmental impacts.

2. Performance indicators

Various studies generally show that the performance of NIS has been much less favorable than projected; operation and maintenance typically fails to distribute water efficiently and equitably; and irrigation systems are rapidly deteriorating. Performance indicators for 30 foreignassisted irrigation projects summarized in Table A3.1 are discouraging. Except for the Upper Pampanga River Project (UPRP) in the early 1970s, all projects took significantly more years to complete than expected; with the rate of time overrun ranging from 33 to 180 percent. Natural calamities and adverse weather conditions, late release of funds due to budgetary constraints and/or bureaucratic problems, changes in design, equipment breakdown, socio-political and office management issues, and peace and order problems caused the delays during the construction period.

Two-thirds of the projects encountered cost overruns, ranging from a low of 12 percent to as high as 209 percent. The sharp devaluation of the peso in the 1970s and the concomitant rise in inflation rates explain the very high rate of cost overrun of the UPRP. Other reasons include changes in system design and other supporting infrastructure, higher than anticipated cost of relocation of affected communities, delays in implementation, cost escalation, and others.

Not only did most of these projects experienced time and cost overruns, 70 percent of the projects with data missed the target-irrigated area by more than 10 percent. Rehabilitation projects performed slightly better in attaining physical targets; three-fourths of them met targets within plus or minus nine percent accomplishment rate.

Not surprisingly, measures of economic internal rates of returns (EIRR) at completion and post-operation dates are generally lower than at appraisal dates. As expected, the ex ante EIRRs were all above 12 percent, the typical cut-off level for approval of donor agencies. They ranged from 13 percent for the Magat River Irrigation System to 34 percent for the Irrigation Operations Support Project, which is primarily to strengthen NIA as an institution and the operations and maintenance of NIS. Among the 18 projects with available estimates of EIRRs at completion dates, nearly half of the EIRRs available were significantly lower than ex ante estimates; with four projects having EIRRs that were way below 12 percent. Post-evaluation estimates of EIRRs (after several years of operation) are available only for seven projects, and in five out of the seven projects, the estimated EIRRs were below 12 percent.

A number of other performance indicators related to operations of the NISs would suggest that low economic rates of returns of public investments in NIS are pervasive. The ability of the NIS to deliver sufficient irrigation water over the whole service area during the wet season has been declining, as the ratio of actual irrigated area to service area fell from nearly 100 percent in the 1960s to only 70 percent in recent years. Moreover, the average ratios of benefitted

area (i.e., where yields are at least 2 t/ha) to actual irrigated area slowly declined from 95 percent to 90 percent in recent years in both the wet and dry seasons.

The construction of the large reservoir systems, such as the UPRIS and MRISS, as well as improvements in the Angat-Maasim Reservoir System, that ensured water supply in the dry season led to the doubling of the percentage ratio of dry season irrigated area to total service area from 30 to 60 percent between the late 1960s and the early 1980s. That pattern continued at a slower pace since then, reaching 70 percent in recent years³. However, cropping intensity based on NIAs definition (that is, the ratio of the wet plus the dry season actual irrigated areas to service area), hardly increased over the whole period. That apparent stagnation has been not so much because the rate of double cropping has not increased, but because of the widening gap between actual irrigated area and service area in the wet season.

When actual irrigated area is compared with design area, the picture is even more disappointing (Table A3. 2). By 2008, firmed-up service area averaged only about 74 percent of design area at appraisal stage. The ratio of actual irrigated area to design area in the wet and dry seasons is even lower (around 60 percent), while the ratio of benefitted area to design area drops down to only 50 percent. Similar to Ferguson's (1987) analysis based on a sample of 30 NIS (Table A3. 3), we found these performance indicators to be lower for the systems that are of later vintages. These indicators were relatively low for systems built before the NIA establishment in 1965 compared to the early NIA period (1965-1980), but these were even lower for systems built during the last 12 years. For example, the ratio of actual wet season irrigated area to design area averaged 63 percent and 71 percent for irrigation systems built before NIA and after NIA, respectively, but this was only 32 percent for the latest vintage (1996-2008) of NIS.

Another indication that the estimated ex post EIRR would be significantly less than at appraisal is the shorter than expected life span in practice. Based on a sample of 40 NIS, Shepley et al (2000) found the average interval between start of operation and first major rehabilitation to be 19 years with a standard deviation of 14 years, compared to the international norm of 25 to 30 years. David and Inocencio (2010) reported remarkably similar average interval of 20 years among the 144 NIS. As consistent with the earlier pattern, the more recent vintages of NIS performed more poorly than older systems. On average, NISs built prior to 1965 were rehabilitated only after about 30 years. NISs constructed between 1965 and 1980 were

rehabilitated after 18 years, while those built even later took only 8 years before undergoing some form of rehabilitation.

Overestimation of available water supply during appraisal and other design mistakes, deterioration of watersheds, siltation of river systems and irrigation canals explain the accelerated deterioration of NIS. Another major cause is the inadequate level of routine, preventive maintenance. Persistent underfunding of routine maintenance raises the cost of maintenance requirement over time, as irrigation facilities depreciate faster, leading to an earlier need for rehabilitation. According to a 1984 study (PRC Engineering Consultants, Inc and SGV Co.), the desirable operational and maintenance (O&M) cost is P386 per ha of service area, which was more than 60 percent the average O& M expenditure per hectare at that time. Another study in 1998 placed the sustainable O&M expenditure at P 2,412 per ha, compared to an average expenditure of only P 1,000 (ISF Completion Report 1998). The most recent study (Shepley et al 2000) recommended a level of O&M that is 5 percent of capital cost which in 1999 prices amounted to P 2,300 per ha or slightly more than double the actual O&M expenditures.

Underfunding of operation and maintenance stems largely from low collection rate of irrigation service fees, averaging 55 percent of current account in recent years. In turn, the low collection rate is due at least in part to inadequate water service received by farmers, especially at the tail-end of irrigation canals. And thus, the vicious cycle of persistently inefficient water service, chronic underinvestment of operation and maintenance, unabated deterioration of facilities, and back to persistently low collection rate of irrigation fees starts (Araral 2006). Efforts to break that vicious cycle by transferring the task of operating and maintaining NIS to irrigators' associations to reduce the cost of O&M and raise the collection rate of irrigation service fees, have been limited to a small fraction of the service area.

The generally poor performance of large gravity systems over the past several decades may be observed in most Asian countries (Barker et al 2010; David 2004; Plusquellec 2002). Many studies blame unaccountable or inefficient bureaucracies, but Barker et al contend that the underlying reason is the fact "that many of the socio-technical preconditions that made gravity flow irrigation sustainable in the past no longer exist". Among these are the growing scarcity of water as a resource, greater concern about environmental impacts, shift in demand for irrigation away from rice to high valued crops, technological developments in pump irrigation, and so forth.

As in many other Asian countries, private investments in irrigation development have grown rapidly over the past two decades. Based on the 2002 agriculture census data on inventory of water pumps, as much as 600,000 hectares are irrigated from groundwater resources (David $2010)^4$. Future growth in irrigated area will increasingly be through expansion of pump and usage using groundwater resources, as economic potentials for expanding gravity irrigation systems reach its limits, efficient management of existing systems continue to be elusive, and effective demand for irrigation water comes mainly from higher valued crops. However, the government has not geared up to assume the appropriate public sector role in the regulation of groundwater extraction and water pollution to ensure sustainability of the quantity and quality of groundwater, in coordinating conjunctive use of surface and groundwater, in aquifer characterization, and so forth. Growing scarcity of water and increasing water demand for domestic and industrial use has raised the opportunity cost of using water for agriculture. Yet, the appropriate policy, regulatory, and institutional framework for efficient, equitable, and sustainable allocation and management of competing use of water across various uses has not been instituted. Furthermore, efforts to increase efficiency in water provision and use at the system and farmer level through research and development, extension, and other means have been quite limited.

We reiterate that this indicator of irrigation support does not reflect the value of the irrigation service from the point of view of the farmers. Furthermore, the actual cost of the capital stock, rehabilitation, and operation and maintenance used in the estimation of the irrigation use support does not reflect the minimum cost of an efficiently built and managed irrigation system. The problems of inefficient design of irrigation facilities, low quality of construction, inadequacies in operation and maintenance, and overpricing of construction costs through graft and corruption have been pointed out in earlier studies (David 2003;Oorthiezon 2003; Araral 2006).

Table A3.4 presents the estimates of annual average net government cost of NIS irrigation service in real terms based on about 85 percent of service area with available data and on extrapolation for total service area for the whole study period and various sub-periods. The rapid growth of cost of irrigation service up to the early 1980s reflected the near doubling of NIS

service area and the higher construction cost per hectare for building new irrigation systems, particularly those with large storage capacity to supply irrigation water during the dry season. This growth slowed down considerably since the mid-1980s, as growth of service area leveled off. Public investments on NIS shifted to rehabilitation because the low world rice prices coupled with rising construction cost per hectare of irrigated area could not justify new construction of large irrigation systems. Nevertheless, three new fairly large, high cost irrigation projects were built in recent years that have raised the net government cost of NIS irrigation service per hectare, without significantly expanding total service area.

	Time	Cost	Т	arget			
	overrun	overrun	accom	plishment		EIRR	
			New	Rehab	Appraisal	Completion	Evaluation
Asian Development Bank							
Agusan del Sur Irrigation Proj	100	60	-16	-	18	12	7
Angat Magat Integrated Ag Dev't Proj	33	-5	-58	11	24	38	17
Bicol River Basin Irrigation Dev't	79	-6	-	-	22	-	2
Cotabato Irrigation Proj	179	3	-	-	14	-	
Davao del Norte Irrigation Proj	150	121	-6	-		21	18
Highland Agri Dev't Proj a/	40	23	-11	-10	18	-	-
Irrigation Systems Improv't Proj -1	100	18	-8	-7	27	29	-
Irrigationation Sector Project	40	50	-43	14	31	4	-
Kabulnan Irrigation & Area Dev't Proj	80	31	-22	-	16	18	-
Laguna de Bay Dev't Proj	63	42	-	-	14	-	2
Laguna de Bay Irrigation Proj II	138	-21	-	-	17	-	6
Palawan Integrated Area Dev't Proj II	40	94	-26 b/	-12 b/	18	-	-
Pulangui River Irrigation Proj	75	27	-21	-	19	12	11
Sorsogon Integrated Area Dev't Proj	33	45		-25	18	5	-
World Bank							
Upper Pampanga River Project	0	209	-	-	14	20	-
Aurora-Penaranda Irrigation Proj i/	100	57	-17	9	17	12	-
Chico River Irrigation Proj, Stage I	150	32	-2	7	-	-	-
Communal Irrigation Dev't Proj I a/	80	70	0	173	19	17	-
Communal Irrigation Dev't Proj II	80	-14	11	-	19	15	-
Earthquake Reconstruction Proj	40	-36	-	-	-	-	-
Irrigation Operations Support Proj c/	33	19	-	-	34	28	-
Jalaur Irrigation Proj, Stage I	50	2	7	-7	-	-	-
Magat River Multipurpose Proj d/	-	-	-8	-1	13	12	-

Table A3.1: Measures of time and cost overrun, and Economic Internal Rate of Return (EIRR) of selected foreign-assisted irrigation projects

	Time	Cost	Т	arget			
	overrun	overrun	accom	plishment	EIRR		
			New	Rehab			
MRMP Ia	0	99	-	-	-	-	-
MRMP Ib	100	12	-	-	-	-	-
MRMP II	20	3	-	-	-	-	-
MRMP III	167	56	-	-	-	-	-
Nat'l Irrigation Systems Improv't Proj I	125	12	-27	3	-	-	-
Nat'l Irrigation Systems Improv't Proj	80	-4	-54	19	-	-	-
II							
Phil. Rural Dev't Proj -IC (MIRD)e/	60	75	-32	0	-	14	-
Tarlac Irrigation Systems Improv't Proj	150	54	-63	-2	15	15	-
Watershed Mgt. & Erosion Control	33	41	0	-	18	4	-
Proj							
Others					-	-	-
Visayas Communal Irr'n &	33	-1	-20	1	20	-	-
Participatory Proj f/							
Bohol Irrigation Proj I g/	160	130	0	-	-	-	-
Libmanan/Cabusao IAD h/	100	81	-12	-		28	9

	Service area		rvice area					Cropping intensity (%)		
	(has)	(% to total)	SA/DA	FSA/DA	Wa/SA	Wa/DA	Da/SA	Da/DA	(Wa+Da)/ SA	(Wa+Da)/ Wa
)								
Total	722,855	100.0	83	74	75	62	73	61	148	198
By system size										
UPRIS	112,532	15.6	100	88	89	90	80	81	170	190
MRIS	88,370	12.2	87	83	88	77	87	76	176	199
Angat- Maasim	31,485	4.4	100	85	57	57	83	83	140	245
10,000- 16,000	109,221	15.1	79	74	70	55	77	61	147	211
5,000-9,999	92,116	12.7	77	68	74	57	63	49	137	186
4,000-4,000	48,339	6.7	78	66	65	50	66	51	130	201
3,000-3,999	64,958	9.0	81	70	68	55	63	50	131	192
2,000-2,999	72,155	10.0	83	78	72	60	72	60	144	200
1,000-1,999	67,698	9.4	77	67	71	55	71	55	142	200
Below 1,000	35,981	5.0	69	58	62	43	56	39	119	191

 Table A3. 2: Area indicators for NIS, 2008

By vintage

.

	Service	e area							Cropping i	intensity (%)
Before NIA 1965-1980	(has)	(% to total)	SA/DA	FSA/DA	Wa/SA	Wa/DA	Da/SA	Da/DA	(Wa+Da)/ SA	(Wa+Da)/ Wa
1981-1995	172,208	23.8	82	72	65	53	70	57	135	208
1996-2008	62,540	8.7	73	66	44	32	49	36	93	212

Notes: FSA is firmed up service area, SA service area, DA design area and Wact and Dact actual irrigated area in wet and dry season, respectively.

Source of basic data: NIA

	Median	Mean
	74	75
All systems	/6	/5
By design system size		
Small (less than 1,000 ha)	71	79
Medium (1,000-3,000 has)	72	76
Large (more than 3,000 has)	77	73
By vintage		
Pre-NIA (before 1965)	93	94
Early NIA (1965-1972)	71	70
Recent NIA (1973-1983)	52	56

Table A3. 3: Average of maximum irrigated area as percentage of design area, selected NISsystems, 1965-83

a. Based on 41 NIS systems (see p.44). Source: Based on Table 3.5 of Ferguson (1987)

Table A3.4: Annual average net government cost of irrigation service of NIS, 1960-2008

	1970-08	1970-85	1986-08	1970-79	1980-89	1990-99	2000-8
Actual service area	2,801	759	4,222	316	2,322	4,109	4,641
100% service area	3,374	1,023	5,010	348	3,031	4,866	5,460

Source: Inocencio and David (2010)

Figure A3.1: Trends in irrigation investment and corporate expenditures, NIA, 1976-2008







Figure A3.2: Public expenditures for NIS, CIS, and others, 1965-2005

Endnotes

 2 In the 1970s, the share of local counterpart funding in foreign assisted projects averaged 70 percent, nut this share declined to about 25 percent since the 1980s.

³ Aside from irrigation expansion, the introduction of non-photoperiod sensitive and shorter growth duration modern varieties and the increasing share of NIS service area in the Visayas and Mindanao where rainfall distribution is more evenly distributed within the year contributed to the growth in the dry season irrigated area..

⁴ Based on independent census of irrigation pumps undertaken in Region 1 and 3, David (2009) estimates irrigated area under pumps to be remarkably similar at around 600,000 hectares.

¹ Until a more reliable estimate becomes available, this portion of irrigation expenditure is embedde in the estimate of production support.

ANNEX 4.1: LAND REDISTRIBUTION

1. Overview of land reform programs

Unequal distribution of landownership and perceived unfairness of share tenancy arrangements have historically been a major cause of agrarian unrest (Hayami, Quisumbing, and Adriano 1990). Efforts to regulate land rents, transform share tenants to leaseholders, and impose land ceilings to reduce inequality in distribution of land ownership that began in the Commonwealth period (Rice Tenancy Act of 1933, Agricultural Tenancy Act of 1954, Land Reform Act of 1955, and Land Reform Law of 1963) have generally failed.¹

It was not until the enactment of the PD 27 or the Land Reform Code of 1972, soon after President Marcos declared Martial Law that any significant redistribution of land ownership occurred. PD 27 declared all tenants of rice and corn lands as "deemed owners "of the land they were cultivating under the Operation Land Transfer (OLT) and Operation Leasehold program. Landowners were only allowed to retain 7 hectares; while tenants on retained lands cannot be evicted and shall remain as leaseholders. Valuation of redistributed land was basically confiscatory, with the price of the land set at 2.5 times the average annual value of rice production, which is way below the market value. Furthermore, landlords are to receive cash payment for only 10 percent of the prescribed value of the land, while the remaining 90 percent shall be paid in government bonds. Upon the issuance of Certificates of Land Transfer (CLTs), tenants cease paying land rental to landowners and instead start making amortization payments to the Land Bank at 6 percent interest rate over a period of 15 years. After completing the amortization payments, farmer beneficiaries receive Emancipation Patents (EPs) which serve as the legal title of land ownership.

With the end of martial law, the new Congress of the Corazon Aquino government passed the Comprehensive Agrarian Reform Law (RA 6657) in mid-1988, which covered the redistribution of all private and public agricultural lands. In contrast to PD 27, however, CARP mandated landowners' compensation to be at market value of the land (also 10% in cash and remainder in 10-year bonds), limiting the income redistributive effects, and raising the government cost of the program. Furthermore, the law exempted private fishery and livestock lands, postponed the redistribution of banana and pineapple plantations by a decade, and allowed

the distribution of shares of corporate stocks to farmer beneficiaries, instead of redistributing landownership for at least 10 sugar corporations. Meanwhile, farmer beneficiaries are to make annual amortization payments to the Land Bank over 30 years at 6 percent interest rate; and the same limitations on land transfers as PD 27 applies².

2. Accomplishments

Table A4.1 presents the accomplishment rates of the land redistribution program as of end of 2008 as measured by the number of hectares granted CLTs under PD 27 and Certificates of Land Ownership (CLOAs) under CARP³. Figure A4. 1 depicts the trends in the cumulative hectares of accomplishments from 1972 to 2008. Because of the martial law regime and the prevalence of share-tenancy arrangements on rice lands, implementation land reform in rice areas under PD 27 was relatively rapid. By 1986, more than 750 thousand hectares of rice lands have already been granted CLTs. This accomplishment was significantly below the estimated 1.2 million hectares of tenanted lands in 1972, but way above the estimated 14,000 hectares redistributed under the Macapagal's Land Reform Code of 1963, and the reported 25,000 hectares of public lands under the Magsaysay presidency (Hayami, et al 1990). Aside from the greater budgetary resources allocated for its implementation, the dramatic increase in returns to land due to expansion of irrigated areas and widespread adoption of modern rice varieties strengthened demand for land reform implementation by tenant farmers (Otsuka et al 1991).⁴

The CARP was instituted under a democratic regime and covered a much wider area, including plantation-operated landholdings. Its implementation initially focused on the distribution of public lands where target area was reached in less than 10 years, and the accomplishment rate exceeded target by more than 20 percent. For private lands, 80 percent of accomplishment was in terms of issuance of EPs to land reform beneficiaries of PD 27's operation land transfer (24 percent), and CLOAs under the voluntary land transfer (30%) and voluntary offer to sell (26 %) arrangements. Accomplishment rate under these arrangements far exceeded their target scope. On the other hand, only 20 percent of accomplishment relates to the compulsory arrangement (12%) and redistribution of land owned by government financial institutions (7%). Thus, accomplishment rates under the compulsory arrangement (19% of target area) and GFI (72 %) continue to be low, even after 20 years of program implementation.

3. Agrarian reform expenditures

From 1960 to 1986, public expenditures for land redistribution were funded solely from annual appropriations (GAA) to DAR and its predecessor agencies. With the passage of CARP in 1987, all proceeds from the sale of former President Marcos confiscated assets were allocated to an Agrarian Reform Fund (ARF) for the financing of both land redistribution and provision of support services to land reform beneficiaries. Figure A4. 2 presents the trends in the consolidated public expenditures for agrarian reform funded from the GAA and the ARF, including foreign grants and loans, and disaggregated into land redistribution and beneficiary development.

From 1988 to 2008, land redistribution accounted for 68 percent of total public expenditures for agrarian reform (40% for land processing, including agrarian justice, and 28% for landowners' compensation), while about 32 percent has been allocated for support services to program beneficiaries. It is interesting to note the annual levels of expenditures for land redistribution under PD27 to be similar to spending for land processing under CARP, since landowners' compensation released prior to 1988 was very small. Foreign-assisted grants and loan projects contributed significantly (average of 35% and nearly 50% in the recent decade) to the funds allocated for support services to farmer beneficiaries.

The greater portion of budgetary outlays for beneficiaries' development were transferred to implementing agencies, such as the NIA for irrigation, LBP for credit, DPWH for market infrastructure, DA for production support services and extension related activities, and so on. In this study, the expenditures for beneficiary development were disaggregated further by policy instrument, and distributed accordingly.

4. Transfer of returns to land

The factor share of land (net of amortization payments) represents a conservative estimate of the annual resource transfer from landowners to farmer beneficiaries arising from the government's land redistribution program. Other factors that may affect the market value of the land, such as potentials for urbanization, location, etc., are not reflected in this measure of land rental. Estimates of resource transfer under CARP may even be more understated, because the potential benefits from the distribution of public lands and private land under the voluntary land transfer arrangement are not included. Only the annual resource transfers from lands

redistributed under the voluntary offer to sell (VOS), compulsory acquisition (CA), and redistribution of foreclosed agricultural lands of government financial institutions (GFI) have been estimated.

Figure A4. 3 shows the trends in the annual net value of factor shares of land in 1985 prices received by farmer beneficiaries from the landownership redistribution under the PD 27 and the CARP. Farmer beneficiaries of the PD 27 began receiving the factor share of land as soon as certificates of land transfer (CLTs)were issued, after which rental payments to landowners ceased and amortization payments to the Land Bank started. In the case of CARP, we assume that farmer beneficiaries begin to receive the returns to land and pay land amortizations after their Certificates of Land Ownership (CLOA) are issued.

Up until 2008, the estimated resource transfers to farmer beneficiaries under PD 27 were generally higher than under the combined VOS, CA, and GFI under CARP, even though the land redistributed under the latter was already about 40 percent higher than that under PD 27. This is mainly because of the higher rental value implicitly assumed for rice lands under PD 27 (which benefitted from the increasing proportion of irrigated area, cropping intensity, and adoption of modern rice technology) compared to that assumed for lands covered under CARP. All compensable lands under CARP were assumed to be rainfed, including those for rice, which would generally have lower returns to land per year.

Amortization payments are also much lower under PD27 because of the confiscatory nature of land valuation, in contrast to CARP where farmer beneficiaries had to pay the market value of the land. In fact, total amortization payments of farmers holding CLTs constituted less than one percent of the total resource transfers from factor share of land received by farmer beneficiaries, whereas this ratio was close to 7 percent for farmers holding CLOAs under the compensable private lands under CARP.

Until recent years, factor share of land transferred to farmer beneficiaries of PD 27 still exceeded the transfers from CARP by nearly two-fold (Table A4.2). Given its sheer size, inclusion of benefits from the redistribution of public lands, even just merely the benefits from formal titling of public lands already being occupied by farmer beneficiaries, may substantially raise estimated transfers from the CARP. Further research as to the crops grown on non-compensable lands distributed under CARP, value of formal titling of public lands, nature of land transfers under VLT, transfers received under the stock distribution option and lease back

arrangement in banana and pineapple plantations, etc. are needed to obtain a more accurate estimate of the stream of annual benefits of farmer beneficiaries from CARP.

Figure A4. 3 charts the total benefits derived by farmer beneficiaries from the land redistribution program, consisting of the annual returns to land directly received from the transfer of land ownership and the government cost(or subsidy) incurred in implementing the program, including the compensation provided by the government to former landowners. Table 28 also summarizes the annual average resource transfer to farmer beneficiaries arising from the transfer of returns to land in comparison to the annual average government subsidy for land processing and landowners' compensation over the whole study period and various sub-periods.

All the budgetary outlays for land acquisition and distribution (LAD) from 1972 to 1988 pertain to the cost of PD 27. After 1988, the portion of the budgetary outlays for land redistribution outside the landowners' compensation attributed to the VOS, GFI, CA under CARP and Operation Land Transfer (as continuation of PD 27 was estimated very crudely based on the relative hectarage accomplished each year. For lack of data on the distribution of landowners' compensation by specific arrangements or programs, we simply assumed all the LOC have been paid to landowners under CARP, since the land value for PD 27 is basically confiscatory.

As to be expected, the administrative cost of implementing land redistribution will be concentrated in the early part of the implementation period. Under PD 27, it took only 5 years (7 years for CARP) before the share of benefits from landownership exceeded the budgetary outlays for implementation. From 1972 to 2008, the government cost of implementing PD 27 accounted for only 12 percent of total benefits received by farmer beneficiaries. In the case of CARP, which started only in 1988 and landowners' compensation is based on market value, the share of all government cost of implementation is nearly 40 percent of total benefit or support. Because not all landowners of lands already distributed (for which CLOAs have been issued) have been compensated, that share likely understates the government cost of program implementation relative to returns to land transferred to farmer beneficiaries.

Note that the hectarage of rice lands granted CLTs under PD 27 is significantly higher than the reported hectarage granted EPs as of end of 2008. It is very likely that some rice lands with CLTs have been reclassified under CARP and granted CLOAs instead of EPs, so that landowners can be paid a higher land value. These cases may have resulted in some double-

counting of returns to land. The divergence between the two figures may also be due to selling and pawning of redistributed lands, such that some rice lands covered with CLTs had been titled illegally or remained untitled. Presumably, farmer beneficiaries would have received the present value of the total rental value of the land over time, if these lands were sold at market value. Some may have sold their land in distress, and thus received less than the true market value. Others may have sold lands in more urbanized area at market values that are higher than discounted present value of the income stream from rice production. The relative importance of these cases will determine whether and to what extent the estimates of net resource transfer arising from the land reform of rice lands are over or underestimated, particularly in later years.

	1972-1986	1987-2008	Scope	Accomplishment (percent)
			1 207	
Total	756	4,036	4,387 (5,164)	109 (93)
Private agricultural lands	756	2,327	2,996	103
OLT	756	555	580	130
GFI	-	165	230	72
VOS	-	600	397	151
CA	-	285	1,505	19
VLT	-	707	285	248
Public lands	55	1,725	1,391	124
Settlements	44	702	663	106
Landed Estates	11	70	70	100
GOL/KKK	-	952	658	145

Table A4. 1: Accomplishments of PD 27 and CARP by type of lands, as of December 2008 ('000 ha)

Notes:

Accomplishment under PD 27 (1972-1986) pertains to the land covered by Certificates of Land Transfer (CLTs).

Accomplishment under CARP pertains to the land covered by Certificate of Landownership (CLOA).

OLT is Operation Land Transfer; GFI is Government Financial Institutions; VOS is Voluntary Offer to Sell; CA is compulsory acquisition; VLT is voluntary offer to sell

Source of basic data: Department of Agrarian Reform.

	1972-08	1972-85	1986-08	1972-79	1980-89	1990-99	2000-08
PD 27							
Returns to land	2,500	1,425	3,154	872	2,414	3,002	3,136
Government support	335	707	108	822	513	51	17
CARP (VOS, CA,GFI)							
Returns to land	655	-	1,054	-	-1	722	1,704
Government support	538	-	866	-	27	928	1,037
(% LOC)	71	-	71	-	86	71	70

Table A4.2: Annual average resource transfer received by farmer beneficiaries from the land reform program in terms of returns to land and budgetary support, 1972-2008 (P Mn at 1985 prices)

Source: Ballesteros and David (2010)



Figure A4. 1: Cumulative accomplishment under PD 27 and CARP, 1972-2008 (Mn ha)



Figure A4. 2 Public expenditures for the agrarian reform program by component, 1960-2008





(P Bn in 1985 prices)

Endnotes

 2 Under both laws, share tenancy is prohibited and farmer beneciaries cannot transfer or sell the land within 10 years of issuance of titles except to legitimate heirs.

³ Shown also is the number of hectares already granted EPs (in place of CLTs) under the OLT of the PD 27. The lower number under EPs compared to than Note that the number than

⁴ There were also many instances of land reform evasions. President Marcos authorized the exchange of Eduardo Cojuangco's vast tenanted landholding in Nueva Ecija with an even larger area of public land in Palawan. With long delays in the processing of claims and issuance of CLTs, many landlords distributed ownership of lands among children and relatives, effectively increasing their retained areas. Tenant evictions occurred with some being paid to move out and purchase land elsewhere. Conversion of farm lands for non-agricultural uses was accelerated to facilitate private land sales or avoid land reform altogether.

¹ Since Congress which crafted these laws were dominated by the landlord class, enforcement of these laws were derailed by limiting funding, introducing exemptions to the rules, impeding the fair adjudication of agrarian disputes, and imposing high land ownership ceilings (Hayami et al 1990)

Philippine Institute for Development Studies Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas

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Marife M. Ballesteros

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For comments, suggestions or further inquiries please contact:

The Research Information Staff, Philippine Institute for Development Studies 5th Floor, NEDA sa Makati Building, 106 Amorsolo Street, Legaspi Village, Makati City, Philippines Tel Nos: (63-2) 8942584 and 8935705; Fax No:(63-2) 8939589; E-mail: publications@pids.gov.ph

Discussion Paper May 2010

The Cost of Redistributive Land Reform in the Philippines: Assessment of PD27 and RA6657 (CARL)¹

M. Ballesteros²

Abstract. This paper examines the cost of implementing redistributive land reform in the Philippines. Land redistribution has become the core feature of land reform in the country since 1972 with the approval of Presidential Decree 27. The coverage of the program was expanded to all agricultural lands under RA 6657 or CARL of 1988. Consequently, funding for land reform increased significantly as government chose to fully subsidize land acquisition, distribution and transfers. From 1972 to 2008, the cost to implement the program has been rising in real terms both in absolute and relative values. The substantial increases in unit cost have been traced to administrative expense and compensation to landowners. Landowners' compensation (LOC) is a major cost item specifically as land reform shifted from a confiscatory scheme to market land valuation. But the impact of market valuation has not been reflected in the initial years of CARP. It appears that most lands acquired in the early years of CARP are marginal lands thus the lower valuation compared to PD 27 which covered mostly irrigated lands with vields higher than average. The impact of market valuation on LOC has been felt in Phase II of CARP when the program started covering lands planted to higher value crops. Overtime, land reform has become a major burden to taxpayers and fully subsidizing the program is not tenable due to fiscal constraints and a growing consensus among scholars that land reform as a strategy to agriculture development has become passé. These same issues are likely to face the extension of CARP in the next five years. Government has to seriously consider alternative ways to land redistribution and alternative programs to achieve land equity and poverty reduction. The paper suggests the following strategies: (1) facilitate negotiated land reform specifically for high value crops; (2) a leaner and rationalized DAR bureaucracy; and (3) effective land tax policy.

Key words: land reform, Philippines, public expenditure

I. Introduction

Land reform in the Philippines traces its history at the beginning of the 20th century. However, redistributive land reform which mandated landownership ceiling on agricultural lands and distribution of lands in excess of the ceiling to tenants became the core feature of the program only in the 1970s. The main laws that governed this strategy are Presidential Decree

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² Research Fellow, PIDS. The paper benefited from the comments and author's discussions with Cristina David, visiting economist at PIDS and lead person of the MEAP Project. The usual caveat applies.

27 of 1972 and Republic Act 6657 or the Comprehensive Agrarian Reform Law (CARL) of 1988. Both laws implemented a nationwide land reform program but PD 27 covers only rice and corn farms while CARL expanded coverage to all agriculture lands and included beneficiary development as another component of land program.

Since the enactment of PD 27 and CARL, land redistribution has become a strategy for equity and poverty alleviation. It is however the most contentious social program to date due to inefficiencies in its implementation. The long delay in the completion of the program has marginalized the impact on social welfare. There is now a growing consensus that the effectiveness of this strategy has been overtaken by events as agriculture's share in the national economy declined and as globalization compels the government to focus on strategies that will foster agriculture productivity and hasten rural diversification (Balisacan 2010).

However, the approval of the program's extension to another five years is rationalized on grounds that land redistribution has been incomplete, that is, the program failed to redistribute the "critical" or productive lands which could have resulted in net positive social impact.³ The Department of Agrarian Reform (DAR), which administers the program estimates that about 1.337 million hectares of these private agriculture lands remain for distribution.⁴ It is envisioned that land redistribution could finally be completed within the extension phase. But this would depend on the extent to which the government can finance the program. The cost to redistribute the balance is expected to be higher as DAR would now cover lands with heavy capital investments and are utilized for non-traditional or higher value crops.

It is important to point out that the success of land reform is positively correlated to easing the cost burden to taxpayers. The Korean and Taiwan land reforms succeeded because these countries deliberately reduced the fiscal burden through policies that limited land compensation and lessen administrative costs of the program (lyer and Maurer 2009). Land redistribution thus was implemented quickly avoiding bureaucratic inertia and uncertainties often associated with long running land reform programs.

³ The "underprovision" of extension services required to make the farmers economically viable was also used to rationalize support for the program. The heart of CARP is however land redistribution and extension support to farmers is provided not only by DAR but other agencies as well thus it can be provided even without land redistribution.

⁴ Department of Agrarian Reform Inventory of CARP Scope as of 2006.

Historically, the progress of land redistribution in the country had been extremely slow. This has been attributed to the high cost of implementing the program (Iyer and Maurer 2009). The fiscal constraint specifically has prevented the Philippine government from subsidizing land reform to a greater extent and this same issue is expected to work against the completion of the program specifically as no major changes in the operational rules of redistribution were provided under the "new" law. A budget of P150 billion has been earmarked for the extension phase from 2009 to 2014. About 40% of this budget will be used for beneficiaries development which leaves P90 billion for land acquisition and distribution. This budget imply an average cost of P67,000 per hectare for the remaining lands to be acquired. Definitely too low given average land valuation of P113,000 per hectare as of 2008. Moreover, this budget will be used not only to acquire the remaining "critical" lands but also to subsidize the cost of land transfer to tenants and to complete the documentation process to beneficiaries issued collective titles.

The extent to which government can support land redistribution and reduce cost of implementation is critical in the extension phase. So far, studies on the financial aspect of land reform have been limited to estimating fund requirement of the program while other studies focused on assessment of accomplishments and impact analysis. The present paper aims to assess the cost of implementing land reform and recommend strategies to minimize cost and improve on program effectiveness.

The discussion is organized as follows: Section II provides a historical account of land reform programs in the country from 1900s onwards specifically highlighting the evolution of interventions. The next section discusses trends in government spending on land reform covering the period 1972 to 2008 which corresponds to the implementation of PD 27 and CARL. Section IV estimates expenditure by land reform programs and compares the average costs of implementing land redistribution under PD 27 and CARP. Section V estimates the value of subsidies to beneficiaries and the last section presents the summary of results and recommendations.

II. Overview of Philippine Land Reform Policy

Land reform has been a major policy intervention in the Philippines as early as the 1900s. It was facilitated by the Americans in 1902 mainly to address the growing insurgency problems caused by the excesses of the friars, who controlled most agricultural estates under

the Spanish rule. The Friars Land Act ushered in redistributive land reform but was confined to large estates mostly owned by the Catholic Church. This Act adopted a market-oriented land reform policy partly influenced by the international treaties that governed colonial nations at that time. In particular, the Treaty of Paris mandated the "protection over the property rights of the Spanish in colonized countries specifically including ecclesiastical bodies" thus the purchase of Friar lands required the payment of "just compensation" (lyer and Maurer 2009 p.11). This valuation method implied that the landowner is entitled to full compensation which would include compensation for improvements made on the estate and other capital expenditures (e.g. sugar mills, railroads). It also meant that the purchase price for the land would be higher than the annual income from production. For instance, the American colonial government paid a price of US\$6.9 million for 170,916 hectares of friar lands.⁵ The estimated annual income from the land is not more than US\$225,000, which meant that the sale price represented more than 26 times income (lyer and Maurer 2009 p 13). The insular government issued bonds to raise this money and these bonds were guaranteed not by American taxpayers' money but by revenues from the government of the Philippines.

Also, the American government chose not to subsidize the land and administrative costs of the program. The land price paid by the tenant or purchaser was dependent on the prevailing price at the time of redistribution or purchase. The tenant or purchaser also pays for the cost of surveying and any administrative expenses including registration fees. To support land purchase, government loaned to farmers the land cost at lower-than-market interest rates. It was apparent then that the American government tried to reduce the fiscal cost of the program but this policy limited access to those who could afford to pay the purchase price.

The Friars Land Act has influenced subsequent land redistribution policies in the country as evident from the land reform laws that followed (Table 1). Under Republic Act 1400 of 1955 and Republic Act 3844 of 1963, redistributive land reform was confined to specific estates and land prices both for valuation and transfers to tenants followed market principles. The acquisition of landed estates was not confiscatory but voluntary on the part of the landowner or selective based on request by a majority of the tenants (i.e., at least 1/3 of tenants). The acquisition process was undertaken through expropriation proceedings by the Courts which determined the valuation of the land based on the principle of "just compensation".

⁵ In 1903, 1US\$ = P2.00.

	19006	1950s	1960s	1070s	1000c
	19005	19005	19005	19/05	19902
Legal Basis	Friars Land Act of 1902	Land Reform Act (RA 1400 of 1955),	Land Reform Code (RA 3844 of 1963)	Emancipation of Rice/Corn Tenant Farmers (PD 27 of 1972)	Comprehensive Agrarian Reform Law (RA 6657 of 1988)
Coverage	Friar Lands	Selective based on Sanggunian recommendation	Selective based on Sanggunian recommendation	Mandatory for all Rice and Corn Lands	Mandatory for all Private & Public Agricultural Lands*
Land ownership	600 Ha (indl)	300 Ha (indl)	75 1	7.1	E hand have
Ceiling	1024 Ha(corp)	600 Ha (corp)	75 nectares	7 nectares	5 nectares
Maximum Size/Beneficiary	16 hectares	6 hectares	3 hectares	3 hectares	3 hectares
Mode of Land Acquisition	Expropriation	Expropriation	Expropriation	Confiscatory	CA, VOS, VLT
Valuation Method	Fair Market Value	Fair Market Value	Fair Market Value	Average Annual Gross Production(AGP) x 2.5	Fair Market Value
				•land processing & transfer costs	•land processing & transfer costs
Subsidy	Credit subsidy	Credit subsidy	Credit subsidy	•credit subsidv	•credit subsidy
Component		,	,	•land cost (transfer from landowner)	•land ammortization subsidy
Implementing Agency	Bureau of Public Lands	Land Tenure Administration	Land Authority	Department of Agrarian Reform	Department of Agrarian Reform

Table 1 Com	narative Policies on	Redistributive	Land Reform	1900s-1990s
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Note:

CA= Compulsory Acquisition

VOS= Voluntary Offer to Sell

VLT= Voluntary Land Transfer

*exclude aquaculture and livestock farms

The earlier land reform laws paid greater attention on tenancy reforms primarily the regulation of landlord tenant contracts and abolition of tenancy. Land redistribution was not prioritized because resettlement on public agricultural lands was considered an alternative to redistributive land reform. In the early years, Philippine frontier land was extensive and government chose to finance the opening up of these lands for farming rather than redistribute

existing private agricultural estates. The resettlement program was heavily subsidized (James 1979). Government financed the settlers' migration to resettlement sites including housing, farm implements, seed, work animals, health care, and food on a no-interest, long-term loan basis. Government expenditure amounted to about P449 million for the period 1954-1963 (James 1979 p.16). On the other hand, government budget on land redistribution in the 1950s to 1960s was nil. The Land Reform Act of 1955 had a budget of only P300,000 total for land acquisition from 1955 to 1962. The Land Reform Code of 1963 also had a budget of less than P1M for four years (Putzel 1990 p 122).

The tenancy situation was not also considered critical in the country at that time (Putzell, 1990 p. 122). It was believed that as long as the tenancy rate was kept below 60% of agriculture population, the tenancy condition is not critical. The Census of Agriculture in 1918 showed that the fraction of cultivated land under share tenancy and labor tenancy amounted to only 19%. While this proportion increased to 30% in 1960, tenancy rate was still way below the critical level. Moreover, government increased expenditure on credit, technology and marketing had raised productivity to a significant level without challenging existing property structure.

In the early 1970s, a radical departure from the earlier land reform policies was undertaken. The Marcos administration issued Presidential Decree 27 (PD 27) in 1972 to provide for a national and confiscatory land reform program. Ownership ceiling was pegged to 7 hectares per individual, a significant fall from the 75-hectare ceiling in the 1960s. The law potentially placed the bulk of agriculture lands under land reform except that the coverage of PD27 was limited to rice and corn farmlands. Plantations and sugar lands thus were protected from the program. The land valuation formula was also a radical change from the past. Landowners' compensation was capped to 2.5 times the annual yield similar to Taiwan's compensation. On the other hand, government chose to subsidize the administrative costs of the program by assuming the costs of land surveys, subdivisions including registration and attorney's fees. The program had positive effects as land redistribution moved at a fast pace in the initial years specifically in some regions (e.g. Region 3) (Hayami, Adriano and Quisumbing, 1990). But in the later years, the program succumbed to bureaucratic inertia possibly due to dwindling funds and legal battles usually with landowners that challenged the valuation of their

⁶ The Korean and Japanese land reforms used a compensation factor of 1.25 times and 7 times the annual yield, respectively (lyer and Maurer 2009).

lands. PD 27 was not completed within 10 years and was soon taken over by events as the Marcos government was unseated as President of the Philippine Republic by the People's Power Revolution in 1986.

The enactment of the Comprehensive Agrarian Reform Law (CARL) was a response to a new political order. The People's Revolution that installed the Aquino government, led to the rise of the grassroots and non-government organizations as major players in Philippine politics. However, the Aquino government had also the support of the elite since Aquino herself belonged to the landed families. The framers of the law under Aquino combined both liberal and conservative policies on land reform. The Comprehensive Agrarian Reform Law (CARL) of 1987 expanded coverage to all agricultural lands but it also promoted market-oriented policies. The law provided for the inclusion of voluntary modes of transfers by landowners and applied just compensation in the valuation of land. The adoption of "just compensation" was said to be consistent with the Bill of Rights of the Philippine Constitutions of 1970 and 1987; therefore, the confiscatory scheme of PD 27 was considered unconstitutional. The government retained the subsidy on credit and the administrative costs of land transfer to farmers. The land reform program under CARL is also referred to as the Comprehensive Agrarian Reform Program (CARP) because of the inclusion of beneficiary support services to the land redistribution program.

The CARL has also altered the institutional arrangement in the implementation of the land reform program (Table 2). The implementation of PD 27 was presided over by the Philippine President and administered mainly by the DAR while CARP is governed by a Presidential Agrarian Reform Council or PARC which is headed by the President with the heads of implementing agencies and private sector representatives as members. DAR acts as the PARC Secretariat and co-administers land redistribution with the DENR which takes charge of the subdivision and distribution of public lands. In particular, the DAR bureaucracy has been expanded to include an Adjudication Board to handle the delivery of agrarian justice in lieu of the special agrarian courts attached to the Department of Justice under PD 27.

It was envisioned that with these institutional changes, land redistribution would be fast tracked and completed within a period of ten years from 1987 to 1997. However, did this not happen and CARP was extended for another ten years (1998 to 2008). Recently, Congress has approved another extension of the program from 2009 to June 2014. The new Act (RA 9700 of

2009) calls for the strengthening of the CARP primarily through the infusion of additional funding of P150 billion for the next five years. The enabling rules on coverage, acquisition, distribution and land valuation are practically the same as CARL.

	Function					
Agency	PD 27	CARP				
	1972-1987	1988-2008				
I. Governing Body	Office of the President	Presidential Agrarian Reform Council				
II. Land Acquisition and Distribution Component						
	Land Acquisiton, Distribution and Development	Land mapping and survey				
DAR	Land Valuation	Generation and distribution of EPs and CLOAs				
	 Generation and distribution of CLTs 	 Legal assistance and adjudication cases 				
	Agrarian legal assistance	PARC Secretariat				
	 Financing and/or guaranteeing the acquisition of farm lots 	 Financing and/or guaranteeing the acquisition of farm lots 				
IRP	 Issuing bonds, debentures, securities and collaterals 	Land Valuation				
	 Granting of short, medium and long-term loans and advances 	 Issuing bonds, debentures, securities and collaterals 				
	 Granting of loans to farmers' cooperatives/associations 	 Granting of short, medium and long-term loans and advances 				
		 Granting of loans to farmers' cooperatives/associations 				
	Define in a the east of					
	Detraying the cost of subdivision survey	 Land survey and approval of surveys 				
DENR	 Undertaking the subdivision survey of the land, including the preparation of the plan. 	 Processing and issuance of patent/CSC inventory of public A and D lands 				
		Reconstitution of lost/damaged survey				
		Inventory of forest occupants				
		Public information and education campaign				
LRA		 Registration and titling of EPs, CLOAs and Free Patents (FPs) 				
DOJ	 Adjudication of agrarian cases 					
	Legal assistance to Agricultural Lessess					
III. Program Beneficiaries	Development Component					

		Training of CARP beneficiaries		
DAR		 Development of peasant fund 		
		Construction of roads, bridges and multi-purpose		
		pavements in coordination with DPWH		
NIA		Construction of communal irrigation systems		
		 Rehabilitation of national irrigation systems 		
		Involved in training activities alongside those of		
		DAR, DA, NIA, DTI and DOLE.		
DPWH		Construction of multi-purpose Small Water		
		Provision of Lovel Lwater supply systems for		
		beneficaries		
		 Construction of new roads and multi-purpose 		
		pavements		
		Improvement of feeder roads		
DTI		Conduct of training on management and antropropourchip		
		Provision of marketing assistance for farmer-		
		beneficiaries, landowners, associations and		
		cooperatives		
		Credit and extension program		
		Conduct of training on organizational		
DOLE		strengthening and development		
DA	 Support services and 			
	development of agriculture for			
	beneficiaries of agrarian reform	 Conduct of training 		
		Provision of techinical and marketing assistance		
		Provision of dispersal activities Infrastructure support		
	1	· · · · · · · · · · · · · · · · · · ·		
		 Provision of special livelihood projects for 		
TLRC		beneficiaries		

Source: DAR, PD 27 Implementing Rules and Regulations

III. Trends in Public Expenditure on Land Reform, 1972 to 2008

The implementation of a nationwide and redistributive land reform starting 1972 consequently increased government spending on the program compared to the early years. Between 1972 and 2008, government expenditure on land reform amounted to a total of P 289

billion in 2007 prices (Table 3).⁷ Expenditure more than doubled in the periods 1988 to 1997 and 1998 to 2008 due to the expansion of the program to beneficiaries' development. During the said periods, beneficiary development programs account for 36% and 13% of actual expenditure in the first and second phase of CARP, respectively. Considering land redistribution or the land acquisition and distribution (LAD) component alone, government spending in real terms is also higher in 1988 to 2008. Note that these figures simply reflect increasing government spending on land reform but do not imply cost effectiveness of PD 27 over CARP since annual expenditures as reported in government accounting system do not distinguish expenditures by land reform programs.⁸

 Table 3. Public Expenditure on Land Reform Programs by Policy Instrument in 10-year periods (PM 2007 Prices)

Period	LOC	LPC	AJD	Total LAD	PBD	Row Total
1972-1982	7,496.86	41,943.29	2,456.41	51,896.56	-	51,896.56
	(14.5)	(80.8)	(4.7)	(100)	-	(100)
1983-1987	2,614.51	7,783.94	-	10,558.79	-	10,558.79
	(25.1)	(74.9)	-	(100)	-	(100)
1988-1997	26,261.94	45,224.70	560.61	72,261.82	40,972.51	113,234.33
	(23.3)	(40.0)	(0.5)	(63.8)	(36.2)	(100)
1998-2008	44,874.71	52,345.00	1,299.69	98,519.39	15,028.89	113,548.28
	(39.5)	(46.1)	(1.1)	(86.8)	(13.2)	(100)
Column Total	81,248.01	147,296.93	4,316.70	233,236.57	56,001.39	289,237.96
	(28.1)	(51.0)	(1.5)	(80.6)	(19.4)	(100)

Source: BESF, PARC

Note:

LOC: landowners' compensation includes cash portion + interest on bonds + redeemed bonds LPC: land processing support such as land survey, titling and other LAD related activities including LAD Operational Support

AJD: agrarian justice delivery has two features: the agrarian legal assistance and adjudication of cases

PBD: is the beneficiary support services component of CARP

Total LAD: LOC + LPC + AJD

- : Negligible

(): figures in parentheses refer to % to row total

LAD gets the bulk of the budget which is apportioned to three policy instruments namely: landowner's compensation (LOC), land processing and agrarian justice delivery.

• LOC = refers to the activities undertaken by the Land Bank to determine the

appropriate compensation to private landowners covered by land reform. The

⁷ Based on actual expenditures or obligations incurred by land reform implementing agencies.

⁸ Although CARL repealed PD27, land redistribution in the latter has not been completed and activities to complete the program are included in the budget and accomplishments of the CARP.
compensation to landowners is paid in cash and bonds which are redeemed yearly up to the 10th year. The annual expenditure on LOC includes the cash portion of compensation to landowners approved by the LBP; the payment for the redeemed portion of the bonds and the interest payments on compensation.

- Land Processing = refers to activities undertaken by DAR, DENR and LRA to identify, acquire and redistribute lands covered by land reform including beneficiary identification and land transfers to beneficiaries. The annual expenditure covers costs of land surveys, land subdivision, generation and registration of titles and other LAD related activities such as land inventory, information campaign and operational support
- Agrarian Justice Delivery = refers to the legal and adjudication support to implement land redistribution. DAR provides the legal assistance and handles cases involving agrarian conflicts. Prior to CARL, adjudication cases were handled by special courts attached to the Department of Justice. Although DAR has now an Adjudication Board, not all agrarian conflicts are settled through this system. The presence of the Board does not also preclude settlement of agrarian conflicts in the regular courts.

Land processing and LOC are the major cost component of LAD. The expenditure on land processing accounts for 63 % of total LAD expenditure and 50 % of total program cost. On the other hand, between 1988 and 2008, 45 % of total LAD expenditure is LOC. The low expenditure on LOC in the 1970s to 1980s is due to the non-payment of landowners' compensation in those years. PD 27 which was the enabling law at that time was confiscatory and land redistribution was undertaken despite non-documentation and non-processing of landowner's compensation. The implementation of PD 27 has been saddled with conflicts specifically between the State and landowners and thus LOC was extremely slow. Even after 2008, some lands covered by PD27 have yet to be acquired or documented.

Expenditure on agrarian justice, on the average, is only less than 2% of total land reform costs. The proportion in the 1970s is higher possibly due to the confiscatory process of land redistribution. However, this amount could be understated for all periods because it does not account for expenditures on agrarian cases brought to the regular courts including the Court of Appeals and the Supreme Court. For instance, the regular courts have the jurisdiction for cases relating to landowners compensation and criminal cases arising from the implementation of the

program (Leonen 2007). Also, land conflicts which are agrarian related can be directly filed in the regular courts such as disputes between putative landowners that delay or affect the implementation of any part of the agrarian reform program or disputes involving participants in the agrarian reform program and third parties. The expenditure on agrarian justice from land reform implementing agencies thus does not fully reflect the magnitude of conflict arising from land redistribution.



Figure 1. Trends in Agrarian Reform Expenditure by Policy Instrument (PM 2007 Prices)

Compared to GDP, total expenditure on LAD is only less than 1% of GDP from 1972 to 2008. The average is 0.12% from 1972 to 1987 and 0.17% from 1988 to 2008 (Figure 2). This proportion remains below the 1% mark even when expenditure for beneficiary development under CARP is considered. The allocation of budget to the program though has not been consistent overtime. The percentage share of land reform expenditure to GDP ranges from low of 0.06 to a high of 0.40 percent. The percent share was highest in the years 1989 to 1997 primarily due to additional budget for beneficiary development programs. However, for both beneficiary program and LAD, the proportion of expenditure on land reform to GDP has been on a downward trend after 1998.



Figure 2. Percent Public Expenditure on Land Reform to GDP, 1973-2008

The budget for land reform has been sourced from both general appropriations and the Agrarian Reform Fund (ARF). For PD 27, the program was funded solely from annual appropriations thus it had to compete with other programs of government. PD 27 was implemented under a Martial Law regime and in the initial years of the program, land reform appropriations were relatively high. Towards the end of the Marcos government, funding for the program declined significantly due to both fiscal and political constraints during the period.

The ARF, on the other hand is a special fund created with the sole purpose of financing activities of CARP. The fund is sourced mainly from proceeds of the privatization of government assets by the Assets Privatization Trust (APT) or Privatization Management Office and receipts from sale of assets recovered by the Presidential Commission on Good Government (PCGG) from ill-gotten wealth. The fund is augmented by general appropriations when proceeds from APT and PCGG are low.

The trend in the percent share of agrarian reform to GDP under CARP moves in the same pattern as the availability of funding from the ARF. In the early years of the program, remittances from APT and PCGG were consistently high (Table 4). However, as funds from these sources dwindled, the percent expenditure to GDP also declined. By 1998 to 2003, the program had to rely solely on general appropriations (GAA). It had to compete with other sectors and programs for financing and as shown, the proportion declined further from an

average of 0.21 percent in 1989 to 2000 to an average of 0.13% in 2006 to 2009. The expenditure for beneficiaries' development also remained low at 0.02% for the same period.

Year	APT/I	РМО	PC	GG	Other Sources ² GAA Augmentation		A ntation	Total	
Total	30,035 ¹	(18%)	74,545	(44%)	7,902	(5%)	55,997	(33%)	168,479
1987	1,193	(100%)	-	-	-	-	-	-	1,193
1988	5,015	(78%)	1,337	(21%)	71	(1%)	-	-	6,423
1989	3,897	(73%)	345	(7%)	1,064	(20%)	-	-	5,306
1990	3,498	(56%)	797	(13%)	1,939	(31%)	-	-	6,234
1991	3,378	(70%)	681	(14%)	794	(16%)	-	-	4,853
1992	1,602	(56%)	205	(7%)	1,067	(37%)	-	-	2,874
1993	1,323	(55%)	144	(6%)	946	(39%)	-	-	2,413
1994	1,821	(11%)	15,132	(89%)	-	-	-	-	16,953
1995	1,007	(60%)	670	(40%)	-	-	-	-	1,677
1996	482	(62%)	290	(38%)	-	-	-	-	772
1997	396	(39.6%)	227	(22.7%)	1	(0.1%)	376	(38%)	1,000
1998	-	-	1,143	(14%)	261	(3%)	6,684	(83%)	8,070
1999	129	(2%)	382	(5%)	177	(2%)	7,124	(91%)	7,812
2000	822	(9.4%)	36	(.41%)	6	(.07%)	7,878	(90.1%)	8,742
2001	68	(1%)	498	(5%)	-	-	8,932	(94%)	9,498
2002	644	(7%)	165	(2%)	-	-	9,050	(92%)	9,859
2003	219	(3%)	117	(1%)	148	(2%)	7,403	(94%)	7,887
2004	149	(1%)	8,971	(49%)	672	(4%)	8,549	(47%)	18,341
2005	123	(2%)	7,357	(96%)	212	(3%)	-	-	7,692
2006	176	(2%)	8,406	(95%)	258	(3%)	-	-	8,840
2007	14	(0.1%)	25,251	(98.8%)	286	(1.1%)	-	-	25,551
2008	3,985	(75%)	1,340	(25%)	-	(25%)	-	-	5,325

Table 4 AR	PE Sources	of Funds	1987-2008 (PM)

Source: PARC

Note:

() figures in parenthesis refer to % to total

¹ Net of custodianship expenses and other remittances credited to General Fund equivalent to 40% of sales proceeds, less Php18billion.

² Other sources- remittance from Landbank of the Philippines to the Bureau of Treasury on Agrarian Reform Loan(ARF credit program), Agrarian Reform Receivables(i.e. land amortization), Collection from Term Deposits

IV. The Cost of Land Redistribution by Program

While expenditure data is not categorized into land reform programs, it is possible to estimate cost by program based on DAR and Land Bank's accomplishment reports which identify outputs into PD 27 and CARP. From 1972 to 1986, the enabling law on land reform was

PD 27 thus expenditure data during this period can be attributed solely to the implementation of PD 27. The year 1987 was considered a transition period which laid the ground works for the approval of the CARL. Government spending from 1987 onwards would include both the expenditures for the completion of PD 27 program and the implementation of land redistribution based on CARL.

As mentioned earlier, the LAD component is the core component of the land reform or agrarian reform program. Government has so far acquired 2,327 hectares of private agricultural lands and 1,780 hectares of public agricultural lands and the distribution of these lands benefited a total of 2.4 million beneficiaries (Table 5).⁹

	1972-	1987-2008			Working	% Accomplishment*
	1986	Phase I	Phase II	Total	2006)	
Total	756	2,772	1,334	4,107	4,428	93%
Private Agricultural Lands	756	1,403	923	2,327	3,093	98%
OLT (CLT)	756	513	57	570	616	93%
GFI		127	38	165	243	68%
VOS		301	299	600	438	137%
CA		127	158	285	1,507	19%
VLT		335	372	707	288	245%
Public Lands	0	1,369	411	1,780	1,335	133%
Settlements	0	608	138	746	604	124%
Landed Estates	0	78	3	81	70	115%
GOL/KKK	0	683	269	952	661	144%

Table 5. Accomplishments of Land Redistribution Program, PD 27 and CARP (RA 6657).

Note:

OLT is Operation Land Transfer; CLT is Certificate of Land Transfer; GFI is Government Financial Institutions;

CA is Compulsary Acquisition; VLT is Voluntary Land Transfer, VOS is Voluntary Offer to Sell

* as % of DAR CARP Accomplishment(1987-2008)

1972-1986 accomplishment based on Ministry of Agrarian Reform data; 1987-2008 based on DAR CARP data Phase I: 1987-1997; Phase II: 1998-2008

⁹ For the average cost analysis, we consider mainly accomplishments in terms of area since beneficiaries' data can change overtime due to migration, subdivision and/or transfers undertaken by the beneficiaries themselves.

The accomplishments of PD 27 which covered mainly private lands were based on the number of CLTs printed and issued from 1972 to 1986. A total of 756,000 hectares were distributed of which 50% were outputs in the initial years of the program. The reported accomplishments under PD 27 and CARP are different due to differences in the definition of outputs. For PD 27 outputs were measured in terms of printed and distributed Certificate of Land Transfers (CLTs) while CARP records accomplishments based on titled and distributed lands. CLTs are not titles but award certificates which administratively take less time to prepare since it need not go through title registration process. The Operation Land Transfer (OLT) accomplishments reported under CARP are the lands covered by PD 27 that have been titled or issued Emancipation Patents (EPs). The initial years of CARP focused on the conversion of the CLTs into EPs.¹⁰ There were very few titles or EPs generated under PD 27 since land titles were issued only after full payment of the land which would be after 15 years of loan amortization.¹¹

On the other hand, the accomplishment of CARP excluding OLT accomplishments amount to 3.5 million hectares for the period 1987 to 2008. CARP accomplishments include both private lands and public resettlement areas. As of 2008, about 93% of targets have already been accomplished. However, the high accomplishment rate has been achieved by exceeding the targets for redistribution of public lands and private lands under voluntary schemes. Comparatively, the accomplishment of the program for compulsory acquisition (CA) which is perceived to cover the "critical" lands was dismal. CA accomplishment is only 19 % of scope and 12 % of total accomplishment on private lands.

Note that not all private lands acquired under CARP are compensable. The enabling law, i.e. CARL, provides compulsory and voluntary modes to acquire private lands. The compulsory modes are those that fall under the CA and GFI categories. CA are mainly private lands while GFIs are agricultural lands owned by government financial institutions (GFIs) which are required to be transferred to DAR for redistribution.¹² Both CA and GFI are compensable.

¹⁰ We surmise based on Land Bank reports and DAR data that OLT accomplishments under CARP mainly involved the documentation and titling of lands redistributed prior to CARP.

¹¹ Lands distributed under CARL were issued Certificate of Land Ownership Awards or CLOA titles to distinguished it from EPs. CLOA titles maybe issued individually or collectively. CLOA Individual title are issued to specific person or juridical body while CLOA collective are issued to group of organized or unorganized beneficiaries which may be considered as individual beneficiaries.

¹² EO 407 of 1990. Prior to EO 407, EO 360 of 1989 simply granted to DAR first priority over these assets (right of first refusal) but under EO 407, the transfer of GFI assets to CARP has become compulsory.

The voluntary modes include: voluntary offer to sell (VOS) and voluntary land transfer (VLT). In VOS, the landowner voluntarily surrenders or offers his land for coverage with corresponding offer price on the land. This scheme reduces bargaining and delays usually caused by resistance or non-cooperation of landowners. In VLT or direct payment scheme the landowner directly transfers land to beneficiary based on a contract approved by the DAR. Payment is made directly by the beneficiary to the landowner. The scheme does not only reduce processing time but also frees government from payment of landowners' compensation.

Both VOS and VLT contributed substantially (1.3 million hectares) to total accomplishments of CARP on private lands. These schemes were encouraged to obtain "quick results at the least cost" but they have become avenues of unscrupulous deals. For instance, VOS had been used as cover up for land speculation (Putzell 1990; 315-316) while VLT was used by landowners to implicitly transfer land to their kin or heirs with government subsidizing the costs of land transfer (Borras 2005).

Government expenditure to achieve these outputs amounted to total of P81 billion for PD 27 and P154 billion for CARP in 2007 prices (Table 6). The expenditure for PD 27 refers to the accumulated expenditures from 1972 to 2008 while CARP expenditure covers the period 1987 to 2008 excluding the amount spent for lands under OLT or PD 27 (refer to Annex A for the annual break down in current prices).

	PD 27	CARP (w/out OLT)					
	1021	Total	Phase I	Phase II			
100	22,987.41	74,045.49	27,562.72	46,482.77			
200	(28.3)	(48.1)	(46.4)	(49.2)			
	55,680.67	78,074.47	31,361.25	46,713.22			
LFC	(68.5)	(50.8)	(52.8)	(49.5)			
without title(1972-1986)	49,163.44	-	-	_			
titling of CLTs(1987-2008)	6,517.23	-	-	-			
	2,646.89	1,669.82	418.28	1,251.54			
AJD	(3.2)	(1.1)	(0.8)	(1.3)			
Total LPC + AJD	58,327.55	79,744.29	31,779.53	47,964.76			
Total ALL	81,314.97	153,789.77	59,342.25	94,447.53			

Table 6. LAD Expenditure by Land Reform Program (PM in 2007 Prices)

Source: BESF, PARC

() figure in parentheses refer to % to total by program

For both programs, the bulk of expenditure in absolute terms is on land processing. Land processing cost amounted in real terms to P56 billion for PD 27 and P78 billion for CARP. The higher CARP expenditure is expected due to higher outputs of the program. Also, the additional activities and agencies in the implementation of LAD may have increased the cost of land processing. In particular, DAR has to conduct land inventory as part of its monitoring function. The land inventory can be costly due to poor landownership information in the country and this cost is expected to have gone up with the prevalence of informal transactions in rural land markets.

Another possible reason for high processing cost is the expanded roles of DENR and LRA in CARP. The inclusion of public lands in the coverage of CARP requires DENR as the custodian of public lands to co-implement the program. LRA with the regional Register of Deeds have also taken a prominent role in LAD since titles have to be issued to beneficiaries upon distribution. LRA is also mandated to lend support to CARP on cases involving problems on titles such as lost titles, fake or double titles.

LRA has a limited role in PD 27 since outputs did not require land titling. The expenditure on generation and registration of EPs was incurred after 1986 with the issuance of Executive Order 228 of 1987 that declared the beneficiaries of PD 27 as full owners and the conversion of their CLTs into titles registered with the Register of Deeds. The period 1972 to 1986 thus reflects primarily the expenditure on land surveys and subdivision costs while the period 1987 to 2008 reflects expenditure on land titling and registration. The land processing cost prior to 1987 amounts to total of P49 million in real terms while total cost of titling and registration based on the expenditure attributed to PD 27 for the period 1987 to 2008 amounts to P6.5 billion in 2007 prices.

Landowners' compensation (LOC) is another major expenditure item. It accounts for 28% of the total cost of PD 27 and 50% of total CARP expenditure. The method of land valuation method affects LOC. As mentioned earlier, PD 27 is based on a confiscatory valuation while CARP uses "fair market value" approach. A higher LOC is thus expected for CARP. On the other hand, considering the higher outputs of CARP, the difference in LOC of CARP and PD 27 is not much. The LOC expenditure on PD 27 corresponds to only 421,398 hectares compared to 1.0 million hectares for CARP.

27 has been slow. Based on Land Bank LOC records, only 56% or of the recorded outputs of PD 27 have been processed and approved by the Land Bank for compensation compared to 100% of the compensable lands under CARP (Annex B).¹³

The "quality" of land approved for LOC also affects land valuation. For agricultural lands, the quality of land is defined primarily by productivity which also reflects the land type and its terrain. Irrigated lands and low land areas would have higher agricultural productivity compared to non-irrigated and upland areas. While PD 27 and CARP have different valuation method, the latter gives higher weight on productivity than other factors.

Table 7. Average Cost of LA	D by Policy Instrument and by	y Program (PM in 2007 Prices)
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A. Average Cost per Year										
	PD 27		CARP(w/o OLT)							
	1021	ALL	Ι	11						
LOC	621.28	3,525.98	2,756.27	4,225.71						
LPC	3,561.16	3,717.83	3,136.12	4,246.66						
without title(1972-1986)	3,277.56									
titling of CLTs(1987-2008)	283.60									
AJD	71.54	79.52	41.83	113.78						
Legal Assistance	13.55	35.33	41.77	29.48						
Adjudication	57.99	44.18	0.06	84.30						
B. Average Cost per Hectare										
LOC ^a	54,550.37	70,175.18	46,955.07	99,290.33						
LPC	76,304.60	22,426.54	14,231.48	36,560.68						
without title(1972-1986)*	65,062.85									
titling of CLTs(1987-2008)**	11,241.75									
AJD ^b	3,502.89	1,888.31	977.61	2,741.98						
Legal Assistance	663.31	839.04	976.22	710.45						
Adiudication	2.839.58	1.049.27	1.40	2.031.54						

Source: BESF, ARF, DAR Accomplishments

^a Based on LBP approved area of Landowners Compensation

^b PD 27: Average cost of AJD based on Total Accomplishments

CARP: Average cost of AJD based on CA,VOS Accomplishments

* accomplishment based on CLTS

** accomplishment based on EPs (or CARP OLTs)

Table 7 presents unit cost per hectare to further assess cost efficiency of the programs. In general, the implementation of CARP has been more cost efficient than PD 27 based on the

¹³ The slow processing is due mainly to disagreements on manner of valuation (including that of area to be compensated) and the inability of government to obtain landowners' compliance to requirements.

cost of land processing. Land processing cost for PD 27, in real terms, amounts to P74,000 per hectare of land redistributed. Comparatively, LPC for CARP is only about P22,000 per hectare. The high cost for PD 27 is attributed to the period 1972 to 1986. The cost to process land redistribution during the period amounted to P63,000 per hectare while the cost to complete documentation and titling of these lands amounted to P11,400 per hectare. However, the high cost from 1972 to 1986 is due to capital expenditures and expenditures from agrarian support services at the Office of the DAR Secretary (Table 8). These expenditures from offices directly involved with land acquisition and distribution as well as tenure improvement show unit cost much lower than that of CARP. This minimal cost is probable since land reform under the program has not been implemented to the fullest. However, due to the absence of detailed information on the budget, the cost comparison between PD 27 and CARP is inconclusive.

	1972	Total 2-1986 (I	PM)	%	%		
PD 27	32	2,145.56	3				
Office of the Secretary	3	1,066.32	6	96.64	1	41,093.0 2	
General Administration and Staff Services	1	,329.884	ŀ	% 96.64 4.14 2.29 45.19 41.22 3.80 0.61 2.27 0.61 2.27 0.10 0.32 0.06 96.64 1,035.30 1,035.30 1,035.30 2.1 130.88 0.39 3,893.26 7. 816.02		1,759.11	
Field Operations		734.620		% 96.64 4.14 2.29 45.19 41.22 3.80 0.61 2.27 0.10 0.32 0.06 Phase II (PM) % to Tota LPC 50,080.85 1,035.30 2,827.63 3,893.26 3,893.26 - 197.15 0.32		971.72	
Capital Improvements and Assistance	14	4,528.06	5	45.19)	19,217.0 2	
Agrarian Reform Services	13	3,250.70	0	41.22	41.22 3.80		
Policy Formulation, Program Planning and Standards Development for Agrarian Reform Services	1	,223.055	5	3.80	3.80 0.61		
Bureau of Resettlement		194.539		0.61	257.33		
Bureau of Land Acquisiton, Distribution and Development		730.111		2.27	2.27		
Bureau of Farm Management		32.821		0.10	0.10		
Bureau of Land Tenure Improvement		102.089		0.32		135.04	
Fiduciary Fund		19.678		0.06		26.03	
	Phase I (PM)	% to Total LPC	Average Cost/ha	Phase II (PM)	% to Total LPC	Average Cost/ha	
CARP (w/out OLT)	35,806.61			50,080.85			
Land Survey							
DAR	2,892.17	8.08	1,312.44	2,827.63	5.65	2,213.08	
DENR	801.19	2.24		1,035.30	2.07	338.75	
Inspection, Verification & Approval of Land Surveys (DENR)	247.26	0.69		130.88	0.26	42.82	
CLOA Generation & Distribution (DAR)	4,098.55	11.45	1,859.89	3,893.26	7.77	3,047.11	
Patent/CSC Processing &Issuance (DENR)	752.09	2.10		816.02	1.63	267.00	
Inventory of Public A & D Lands (DENR)	180.08	0.50		-	-	-	
Registration/Titling (LRA)	166.49	0.46	75.55	197.15	0.39	154.30	
Other LAD Related activities	211.07	0.59	95.78	663.58	1.33	519.36	

Table 8. Land Processing and other LAD Activity Expenditure (PM in 2007 Prices)

Agrarian Land Development Acquisition & Distribution (DAR)	6.29	0.02	2.86	290.49	0.58	227.35
OPERATIONAL SUPPORT	26,457.72	73.89	12,006.3	40,517.04	80.90	31,711.17
PS	18,690.93	52.20	8,481.79	27,077.22	54.07	21,192.33
Other MOE	7,040.27	19.66	3,194.82	13,376.99	26.71	10,469.67
Other CO	726.52	2.03	329.69	62.83	0.13	49.18

Source: BESF, DAR-PARC

Note:

Average Cost per Hectare based on Total Accomplishments per agency or program

Total Accomplishment: CARP (no OLT) : (Phase I: 1988-1997)- 2,203,653 has; (Phase II: 1998-2008)- 1,277,690 has.

DENR: (as of 2007)- 3,056,185 has

PD 27 : 755,000 has

* Details of LPC adjusted proportionately based on accomplishments of OLT and CARP (non-OLT)

It is more useful to compare cost between Phase I and Phase II of CARP since both phases have similar institutional arrangements and budget details. Comparatively, Phase I of CARP has been more cost efficient than the extension phase. As shown in Table 7, the average LPC in Phase I amounts to P14, 231 per hectare compared to P36,560 per hectare in Phase II, an increase of more than two times the average cost in real terms.

The significant increase in unit cost results from the higher costs of DAR land surveys and the generation and registration of CLOA titles (Table 8). The average land survey cost of DAR increased from P1,312 per hectare to P2,213 per hectare in real terms. It has also become more costly to generate titles per hectare as shown by the increase in cost from P1,800 to P3,000 for a land parcel with size of one hectare. The difference in costs may be partly explained by the land acquisition method used in each Phase of the program. The bulk of accomplishments in the first 10 years of CARP were on government lands (GFIs) and public resettlement areas. On the other hand, in Phase II of the program, DAR focused on the acquisition of private lands. Coverage of private lands is more tedious specifically under compulsory acquisition where landowners are often uncooperative. The inability of DAR and LRA to obtain landowners' compliance to requirements implies prolonged processing and additional efforts for these agencies. However, this situation is not sufficient to explain why average costs doubled in the extension phase. These cost items (i.e., subdivision costs and generation of CLOAs) are expected to be cheaper since DAR expedited the process of CLOA generation through the issuance of collective CLOAs.¹⁴ The subdivision survey and generation of individual titles would follow afterwards. About 71 percent of all lands distributed under CLOA

¹⁴ The Agrarian Reform Law of 1988 (RA 6657) allows for collective ownership, that is, collectively owned by the workers' cooperative or association, when current farm management system does not particularly require dividing the land into individual parcels. Otherwise, CLOAs should be issued individually.

or about 2 million hectares are collective CLOAs. Most CLOA collective titles were issued in Phase II of CARP.

Note that the increase in LPC is also due to expenditure on operational support. About 70% to 80% of LPC cost is operational expense which consists of personnel services, capital outlays and other monitoring expense. Overtime, it has become more expensive to maintain the LAD implementing agencies, in particular the DAR bureaucracy. While expenditure on capital has been kept at a low level, personnel and other maintenance expense in real terms ballooned to three and five times the unit cost in Phase II, respectively. Expenditure on operational support is attributed mainly to DAR which is appropriated about 90% of operational support costs (Table 9).

Expenditure on AJD for has also ballooned in Phase II of the CARP. AJD consist of two components- one, the legal assistance to ARBs through the process of mediation, conciliation and representation; and two, adjudication performed primarily by DAR's Adjudication Board (DARAB) which is vested with quasi-judicial powers and primary jurisdiction to determine and adjudicate agrarian reform matters. While the cost of legal assistance to ARBs declines overtime, the cost of adjudication has increased considerably as land reform covered more private lands. Note that in Phase I, more than 60% of CARP accomplishments are on public lands and 15% on VLT. Adjudication expense during this phase was nil. Overtime, as the coverage of private lands particularly under compulsory acquisition increases conflicts tend to rise as more landowners resort to legal arguments as a way of delaying and thwarting the implementation of the agrarian reform process.

	DA	٩R	LBP) a/	DEN	IR	LR	A	OS as
Year	Value (PM, 2007 prices)	% to Total OS	Value (PM, 2007 prices)	% to Total OS	Value (PM, 2007 prices)	% to Total OS	Value (PM, 2007 prices)	% to Total OS	percent of Total LPC
1987	22.98	10.01	206.65	89.99	-	-	-	-	40.73
1988	1,111.26	73.89	344.26	22.89	37.55	2.50	10.86	0.72	87.53
1989	2,379.88	67.28	907.99	25.67	222.07	6.28	27.08	0.77	81.16
1990	3,131.25	70.12	1,076.18	24.10	209.87	4.70	48.10	1.08	90.76
1991	2,354.41	58.49	1,409.36	35.01	205.02	5.09	56.63	1.41	76.69
1992	2,127.09	56.46	1,463.07	38.83	118.86	3.15	58.43	1.55	79.34

Table 9. Operational Support (OS) Expenditure by Agency and by Year, CARP (w/out OLT)

1993	2,137.30	72.06	661.97	22.32	98.88	3.33	67.95	2.29	72.82
1994	1,837.58	58.59	1,122.25	35.78	97.66	3.11	78.76	2.51	65.97
1995	1,953.67	60.97	1,025.50	32.00	121.64	3.80	103.53	3.23	62.68
1996	2,302.72	63.07	1,087.53	29.79	137.98	3.78	122.69	3.36	69.32
1997	2,493.09	64.66	1,071.80	27.80	155.80	4.04	134.71	3.49	76.73
1998	3,645.37	75.94	881.74	18.37	145.57	3.03	127.41	2.65	84.95
1999	3,031.54	72.87	869.74	20.91	142.10	3.42	116.57	2.80	81.71
2000	3,697.73	76.53	905.84	18.75	110.74	2.29	117.23	2.43	83.97
2001	3,182.57	75.46	838.32	19.88	89.50	2.12	107.08	2.54	84.98
2002	2,945.09	94.15	-	-	87.43	2.79	95.48	3.05	85.58
2003	2,572.26	93.80	-	-	82.00	2.99	88.02	3.21	80.70
2004	3,752.89	95.95	-	-	79.53	2.03	78.69	2.01	81.59
2005	3,023.99	95.29	-	-	75.42	2.38	73.93	2.33	69.82
2006	3,044.52	95.35	-	-	74.81	2.34	73.54	2.30	78.92
2007	3,790.23	96.51	-	-	67.70	1.72	69.18	1.76	78.96
2008	4,150.90	96.83	-	-	68.63	1.60	67.34	1.57	78.30
Average	2,667.65	73.83	630.55	21.00	110.40	3.02	78.33	2.14	76.96

Source: ARF

Operational Support (OS) includes expenditure in Personal Services (PS), Capital Outlay and other MOE. We estimated OS for LAD by agency by matching expenditure by activity with individual agency budget.

^{al} From 2002 onwards, LBP budget was mainly utilized for landowners compensation (LOC).

What about the LOC? The LOC per hectare reflects the annual expenditure for compensable lands. It includes the cash equivalent of the approved land values, the interest on bonds and the value of matured bonds. The landowner, upon acquisition of his land is paid in cash and bonds. The cash payment depends on the type of program and mode of acquisition. Under PD 27, cash payment is 10% of the land value and the balance of 90% is paid in bonds at fixed interest rate of 6% with maturity of 25 years. Under CARL, the cash portion varied from 20% to 35% based on the size of land covered and the mode of acquisition. Bond maturity has been shortened to 10 years with 1/10th of the principal value maturing every year. Bond interest rates were aligned with 91-day treasury Bills. PD 27 land valuation and method of compensating landowners was retained under CARP but the PD 27 bonds (both new and remaining) were converted into the "new" Land Bank bonds with terms aligned to that of CARP.

The average value of LOC is higher in CARP than PD 27 but comparison between programs and also between phases is not relevant due to differences in the valuation method and guality of land covered under the programs or Phase indicated. One would expect the LOC to be higher for CARP since valuation approximates market value while PD27 is confiscatory

and thus lower than market valuation.¹⁵ On the other, Phase I of CARP may have lower value than PD 27 or Phase II CARP because of "poorer" quality of land which could refer to marginal or unproductive agricultural lands or those in upland areas. Note that there have been conjectures that, landowners tend to offer lands which are marginal under the CARP VOS scheme.

We determine the "productivity" of the land covered by PD 27 and CARP from the average land valuation provided by the Land Bank.¹⁶ Land Bank computes land valuation based on the formula specified by law. Under PD 27, the value of rice or corn land is computed as follows:

LV = AGP * 2.5 * Price

Where LV = land value AGP = average gross production for three consecutive normal crop years Price = government support price for rice or corn 2.5 = multiplier

As indicated above, PD 27 valuation is based on average gross production for rice multiplied by a factor of 2.5. The selling price has been fixed to the 1972 government support price of P35/ cavan for rice or P31/cavan for corn.¹⁷ The assumption is that lands covered by PD 27 have been distributed prior to CARP but has yet to be documented and compensated.¹⁸

Rice is produce under different production environment and revenues differ significantly across environments. Using PD 27 valuation formula, we estimated the average annual yield of the compensated rice land and compared to the national annual yield of rice under different environments (Annex C).¹⁹ The results are presented in Table 10.

In general, the annual yields of paddy lands acquired under PD 27 are closest to the national pattern of annual yield of irrigated lands specifically in the early years of the program.

¹⁵ Land Bank has been tasked to undertake land valuation for CARP. Account level valuation cannot be provided by the Land Bank but average values of approved landowner's compensation can be obtained from Annual Reports and PARC.

¹⁶ Individual accounts are confidential and cannot be provided by the Land Bank or PARC.

¹⁷ 1 cavan is equivalent to 50 kilos.

¹⁸ The landowners' compensation earns an interest of 6% annual from date of coverage or distribution up to the date of LOC approval.

¹⁹ We assumed that all compensated lands are rice lands since the bulk of lands covered by PD27 were rice farms

The same pattern of yield is also observed in the years after 2004. On the average, we can surmise that irrigated lands cover a total area of 305,000 hectares or 72% of total rice area acquired or compensated by the program. On the other hand, the years 1990 to 1994 and 2002 to 2004 show a pattern of yield similar to the national annual yield of rainfed rice. These years cover about 18% of total. In no year have we observed average yields similar to the national pattern of upland rice. Apparently, most lands acquired under PD 27 are the highly productive rice farms specifically in the first 10 years of the program. The early years of land reform has in fact translated into net social gains as pointed out in the studies of Hayami, Quisumbing and Adiano (1990) and Deininger, Olinto and Maertens (1999).

	Area	ea Average Land	Estimated Average Yield	National Annual Palay Yield by Land Type (cavans/ha/year)				
Year	(has.)	Valuation (P/Ha, Current Prices)	on Compensated Rice Land (cavans/ha) ^a	<i>Average^b</i>	Irrigated ^b	Rainfed	Upland	
1974	6,548	6,193.95	70.79	46.13	60.68	26.59	17.17	
1975	27,681	6,471.91	73.96	53.09	69.74	29.76	17.22	
1976	26,884	7,467.27	85.34	54.95	71.04	30.16	19.75	
1977	28,978	6,815.52	77.89	59.39	77.65	33.11	20.86	
1978	31,806	7,278.19	83.18	60.35	79.35	33.54	21.61	
1979	33,450	6,913.30	79.01	64.79	88.20	34.08	20.37	
1980	19,230	7,315.13	83.60	69.33	88.15	36.07	19.69	
1981	15,180	7,395.26	84.52	73.06	91.32	37.65	20.51	
1982	21,251	7,727.17	88.31	80.37	99.20	39.13	20.26	
1983	20,126	9,038.06	103.29	77.25	94.81	36.52	21.49	
1984	21,013	9,034.88	103.26	81.97	96.91	40.44	21.08	
1985	7,346	8,464.47	96.74	88.28	105.01	42.50	22.35	
1986	7,768	9,008.88	102.96	89.93	107.28	43.22	24.20	
1987	7,213	9,780.95	111.78	89.45	106.99	40.44	22.98	
1988	3,406	11,056.96	126.37	88.69	104.69	40.96	23.45	
1989	6,591	6,384.46	72.97	92.93	109.74	40.79	27.27	
1990	6,942	5,573.32	63.70	92.55	108.30	42.68	26.22	
1991	20,121	4,510.21	51.55	96.43	113.20	43.09	27.49	
1992	18,765	4,526.51	51.73	95.30	111.47	42.02	32.88	
1993	14,258	4,248.14	48.55	96.19	111.64	43.71	29.45	
1994	12,002	4,697.55	53.69	97.21	113.99	43.19	31.92	
1995	10,477	9,292.74	106.20	93.39	108.40	42.28	30.90	
1996	12,457	7,535.52	86.12	98.78	114.63	43.22	28.55	
1997	10,128	8,904.03	101.76	101.61	117.62	42.85	29.78	
1998	7,433	11,545.81	131.95	90.68	102.91	38.46	32.77	

Table 10. Productivity of Rice Lands Redistributed under PD27

1999	5,145	9,243.93	105.64	104.45	118.63	43.60	28.10
2000	3,241	11,314.41	129.31	107.71	122.24	44.60	33.45
2001	2,920	15,890.41	181.60	110.90	124.95	47.28	35.46
2002	2,120	5,363.21	61.29	115.74	129.74	49.57	37.18
2003	2,032	4,980.31	56.92	114.06	127.64	50.47	37.85
2004	1,348	6,624.63	75.71	120.82	134.77	53.28	39.96
2005	1,489	12,128.95	138.62	122.03	136.88	52.70	39.52
2006	1,912	14,513.60	165.87	128.25	142.72	56.03	42.02
2007	2,483	9,170.36	104.80	131.56	145.59	58.57	43.93
2008	1,654	9,340.99	106.75	130.23	143.01	59.68	44.76
Palay	Land Type		Total Area		% to Total Area		
Combi	ned		38,458		9.13		
Irrigate	ed		305,352	305,352 72			
Rainfe	ainfed 77,588 18.4			18.41			
Total			421,398			100.00	

Source: BAS,DAR-PARC, Landbank Accomplishments Note:

^a AGP estimated from valuation formula for PD27:

Value of Rice Land=AGP x 2.5 x Php35.00/cavan

Php35.00 is government support price for one cavan (50 kilos), fixed value for all lands covered by PD27
 ^b Yield per cropping from BAS data adjusted to annual yield using crop intensity in irrigated farms

Estimating the "productivity" of lands covered by CARP is not as straightforward as PD 27 since the formula takes into consideration several factors. CARP fair market valuation is operationalized by the following formula:²⁰

LV = (CNI * 0.6) = (CS * 0.3) + (MV * 0.1)

Where LV = Land value CNI = capitalized net income CS = comparable sales MV= market value per tax declaration

Capitalized net income (CNI) is based on productivity derived from the difference between gross revenue and operating cost. The net income is capitalized at 12% interest rate. Comparable sale (CS) is based on 70% of BIR zonal value while MV is based on government assessed value. Note that not all factors may be available at all times but Land Bank usually places premium on CNI which means that if either CS or MV are available, the corresponding weights of the missing factor is added to CNI. For instance, if CS is not available, 90% of valuation will be based on CNI and only 10% on MV.

²⁰ DAR AO 5 series of 1998

We derive land "productivity" by estimating a net income for lands compensated under CARP. We assume a formula with only CNI available which means that land valuation is based solely on capitalized net income. The net income derived from the CNI valuation is compared with an estimated average net income which is obtained from the percent share of net income on production and the BAS published data on the value of gross production by crop. The share of net income to gross revenue varies depending on the crops grown on the land.²¹ The results are presented in Table 11.

Since there is no information on the actual crops grown in lands compensated by Land Bank, we can do comparisons of net income in two ways - one, based on rice crop alone; and two, based on combination of major crops. The latter assumes that rice, coconut, corn, sugarcane are the major crops grown in the compensated lands with the following proportions: 47, 28, 17 and 8.²²

The results show that the net income derived from compensated lands in Phase I of CARP is similar to the national pattern of net income from rainfed rice. The similarity becomes more pronounced when rainfed production income is combined with production income of other major crops. Phase I of CARP corresponds to about 552,000 hectares acquired through VOS, CA and GFI. On the other hand, , the productivity of the compensated lands seems to have improved from 2000 onwards as the pattern of net income show similarity with irrigated rice combined with other crops. As mentioned earlier, the comparison is not straightforward and would require actual data of crops grown in the compensable lands for the analysis to be relevant. Moreover, although CARP is based on fair market value, the valuation does not imply acceptance of landowner. Note that the LBP valuation reflects a conservative estimate. It can be costly to challenge the valuation of the Bank because this can only be modified through a legal process which is expensive and can take several years to complete. Thus, landowners would resort to legal process only when the difference between Land Bank valuation and

²¹ The percent share of net income to gross revenue is based on studies of production efficiency by crop. See Annex B).

²² These proportions are based on the distribution of lands by crop of sample farmer beneficiaries surveyed in 2000 and 2006 by the Institute of Agrarian Reform and Development Studies. The actual distribution of lands from the survey is as follows: 41% rice, 25% coconut, 15% corn, 7% for sugarcane, 5% banana and 7% for other crops. For simplicity, we considered only the first major crops.

landowner's perceived fair market value is significant. Land Bank argues that there is a shorter list of landowners challenging valuation under CARP compared to PD 27.23

On the other hand, the World Bank study (2009) suggests that the coverage of the program has not been well-targeted and is poorly related to either poverty alleviation or land inequality. CARP accomplishment may as well be not targeted in terms of land productivity hence no clear pattern can be discerned from the results.

Net Income (P/Ha)^b Average Land Area Average Net Year Valuation (P/Ha, Income (P/Ha) ^a Multicrop Multicrop (has.) Irrigated Rainfed current prices) (Irrigated)^c (Rainfed)^c 1988 1,320 27,272.73 3,272.73 3,434.61 1,361.04 3,246.03 2,271.45 1989 1,763 20,516.17 2,461.94 4,070.81 1,664.34 3,889.51 2,758.47 1990 774 15,620.16 1,874.42 4,547.19 1,957.87 3,734.27 2,517.29 1991 125,156 12,374.16 1,484.90 4,472.17 1,882.51 3,790.60 2,573.46 1992 13,981.73 4,726.99 4,120.46 2,814.03 96,639 1,677.81 1,947.37 1993 86,642 25,404.42 3,048.53 5,630.00 2,274.59 4,545.53 2,968.49 1994 59.916 4.994.43 29,494.96 3.539.40 6.230.23 2,371.01 3,180.60 1995 73,184 36,017.03 4,322.04 8,122.55 3,044.72 5,742.92 3,356.34 1996 72,474 41,806.85 5,016.82 9,375.84 3,381.36 6,692.44 3,875.03 69,134 1997 45,121.65 5,414.60 9,635.02 3,287.80 6,957.80 3,974.61 1998 78,358 49,565.46 5,947.85 9,089.36 3,074.42 6,720.45 3,893.43 1999 60,440 50,503.14 6,060.38 10,745.91 3,381.79 7,871.69 4,410.56 2000 46,023 60,037.59 7,204.51 12,180.19 3,755.68 8,037.86 4,078.34 2001 43,529 62,461.58 7,495.39 11,759.83 3,863.07 7,962.04 4,250.57 2002 43,297 77,955.98 9,354.72 12,937.53 4,372.39 9,115.52 5,089.91 2003 42,908 86,076.26 10,329.15 12,573.02 4,461.12 9,099.88 5,287.29 2004 29,061 88,185.54 10,582.26 13,738.30 5,032.79 10,261.60 6,170.00 11,336.27 2005 33,205 15,471.45 94,468.91 5,496.34 11,074.86 6,386.56 2006 33,686 100,619.25 12,074.31 16,002.94 5,860.82 11,929.20 7,162.40 2007 35,263 12,222.86 17,728.24 6,571.75 13,056.83 101,857.19 7,813.28

Table 11. LBP Land Valuation for CARP (without OLT) and Average Net Income of CARP compensated lands

22,380 Source: BAS, DAR-PARC

2008

^a LV= (CNI x 1.0); NI = CNI

113,712.69

0.12

LV= loan value CNI= capitalized net income $NI = (LV \times 0.12)$

1.0= factor 12%= interest rate

13,645.52

21,094.08

8,469.03

15,721.84

9,788.06

²³ The information about landowners which challenge Land Bank valuation is confidential.

- ^b Net income based on studies on production income of crops (Annex Tables). We used the share of residual to gross revenue to compute for net income.Gross revenue based on average annual production value by crops from BAS.
- ^c Multicrop based on IARDS survey on distribution of CARP acquired lands by Crop.

V. Subsidy to Farmers from Land Redistribution

Government chose to fully subsidize land redistribution under PD 27 and CARP. Conceptually, the subsidy comes in the following forms: (1) lower than market price of land; (2) below market interest rate on credit; and (3) exemption from payment of land transfer and titling costs including transfer fees. This section provides an estimate of the value of this subsidy.

Beneficiaries of redistributive land reform pay for the cost of the land. This cost is simply the purchase price of the land or the actual amount paid to landowners. Under P.D 27, compensation to landowners was capped at 2.5 times the average annual yield. This valuation implies that farmers pay a lower price for the land than what they would have paid in the market. The price difference or the cost of land subsidy is borne by the landowners who receive compensation at lower than market. For instance, the Korean land reform capped compensation at 1.25 times annual yield when land values averaged 5 times annual yield thus beneficiaries effectively received 75 percent of land value from landlords (lyer and Maurer 2009). Similarly, in Taiwan land compensation was limited to 2.5 annual yields when historical price of paddy was 4 to 6 times annual yields. This policy effectively transferred to tenants 50 percent of land value. In the absence of historical data on land market values in the Philippines, the transfer to farmers cannot be estimated using value of capital stock of the land. It is however possible to estimate the value of transfers from the value of the future stream of benefits from owning land (David 2010). The annual stream of benefits can be represented by the returns to land or the factor share of land to the annual value of production (David 2010). This method of estimation assumes that the best use of land is agriculture thus rents due to urbanization factors are not reflected in the value of transfer.

David (2010) computed the annual stream of benefits for PD 27 from the area of CLTs redistributed to tenants annually multiplied by the annual value of production based on national production and the factor share of land assumed to be 30% for rice. All transferred lands were assumed to be grown to rice. The same methodology was employed for CARP. Although

CARP uses market valuation, greater weights are given on productivity than other factors. Moreover, as indicated above, the other basis for valuation is the zonal and/or assessed values which do not reflect the true market value since these valuations are used for tax purposes.²⁴

We thus used stream of benefits to estimate the value of transfer from land received by the beneficiaries of CARP. For comparison, only the compensable lands under CARP which are accomplishments on VOS, CA and GFI modes of acquisition were included. Since CARP consisted of several crops, two alternative estimates were made. The first estimate assumes that only one crop (rainfed rice) is grown on these lands while the second estimate assumes that rice, coconuts, corn and sugarcane are grown on these lands with proportions based on the results of survey conducted in 2000 and 2006 among sample beneficiaries of CARP.²⁵

The net present value of the estimated annual benefits net of amortization paid by farmers represents the minimum value of transfer received by farmers. The estimates show that this value is higher for PD 27 compared to CARP estimates despite the smaller area redistributed under the former (Table 12). The total area distributed under CARP VOS, GFI and CA modes amount to more than one million hectares compared to more than 750,000 hectares for PD 27. It is possible that the lower value is due to the assumption of rainfed crop but even with multicrop assumption, the net present value of transfers is still below that of PD 27.

	PD 27	CARP 1988-2008				
	1972-2008	Rainfed ^b	Multicrop ^c			
Resource Transfer ^a	47,449	29,870	35,584			
Transfer Cost Subsidy ^d	4,907	6,821	6,821			
Total Transfer to Farmers	52,356	36,691	42,405			
Interest Rate Subsidy ^e	3,140	10,490	10,490			
TOTAL Subsidy	55,496	47,181	52,895			

Table 12. Estimated Value of Subsidy to Farmers from LandRedistribution

Note:

^aNet present value at 6% discount rate of stream of annual earnings from

²⁴ For instance, assessed value in practice is usually one-third of the market value.

²⁵ Details on the estimates can be found in C. David (2010) Monitoring and Evaluation of Agricultural Policy Indicators. Philippine Institute for Development Studies and the World Bank Office Philippines. Draft Main Report. (forthcoming).

distributed compensable lands net of amortization payments.

^bAssume only rainfed rice is grown.

^cAssume multicrop rice, coconut, corn, sugarcane are grown with the

following proportions 47, 28,17 and 8 percent, respectively (see David 2010).

^d P6,500 is the estimated land transfer cost per hectare (assumed one parcel) at current prices; Transfer cost is multiplied with area of CARP distributed compensable lands and PD 27 distributed CLTs.

^eInt S_i = (i_m - i_p) Lg

where S= interest subsidy

 i_m = market interest based on long-term treasury bill rates

 i_p = 6% interest rate given to ARBs for purchased of land under PD 27 and CARP

L= amount of loan granted annualized for the term of loan

PD 27= 15 and 30 years; CARP= 30 years

In addition to resource transfer, farmers benefit from government subsidy on the costs of land titling which include cost of land surveys, land subdivisions and title registration. The cost of land transfer and titling include the cost of surveys and subdivision and generation of title. An estimate of the current cost of land transfer or titling is as follows: (1) survey and subdivision cost of P3,500 per parcel based on current surveyors' tariff rates; and (2) the cost of title generation and registration which is estimated at an average of P3,047 per hectare based on DAR expenditure data. The total fixed costs of land transfer for one parcel with a size of one hectare would amount to P6,500 or 8% of average gross palay production per hectare. The estimated total land transfer costs is about P4.9 billion for PD 27 and P6.8 billion for CARP based on the total hectarage of redistributed compensable lands. The total direct transfers to farmers from land redistribution thus amount to P52.3 billion for PD 27 and P 42.4 billion for CARP multicrop estimate.

The government also provided tenants the credit for the purchase of the land at a fixed rate of 6% for 30 years. This rate is way below market interest rates on long term Treasury Bills which ranged from 12% to 24% between 1972 and 2006. Starting 2006, the country entered into a low interest rate period with interest rates even less than 6% thus eliminating this subsidy. However, the total accumulated interest rate subsidy in previous years has reached more than P13 billion for both PD 27 and CARP. While the interest rate subsidy is not a direct transfer to farmers it represents an implicit benefit to farmers and forgone earnings of government.

Credit subsidy also includes the value of loan defaults. Many of the beneficiaries have been delinquent on their loans. Loan delinquency under both PD 27 and CARP has been high. Collection efficiency amounts to less than 2% of the amortization due and collectible in the early

years (Annex E). While collection efficiency improved in the later years, amortization payments remain below sustainable levels. Compared to the value of transfers, the value of amortization paid by farmers constitutes less than 1% of total transfers for PD 27 and 2% for CARP (David 2010). A lower collection is expected for the CARP since valuation is based on just compensation or fair market value.²⁶ This valuation implies that annual amortization could exceed farm incomes because both income and investment are capitalized. The CARL mandated a ceiling on annual amortization of farmers based on the value of production as follows: " 2.5% of AGP for the first three years; 5% of AGP for the fourth and fifth years; and 10% of AGP from 6th to 30th year or regular amortization whichever is lower". Adjustment on the amount is made through either reduction in interest rates or the principal. Government thus ends up subsidizing loan amortization and consequently the land cost.²⁷

The CARL imposes foreclosure for delinquent accounts, i.e, non-payment for 3 annual amortizations but in practice government has been lenient towards delinquent farmers. Delinquent loans are usually restructured thus raising difficulties in the estimation of value of credit subsidies due to loan deficiency.

VI. Summary and Conclusions

Land redistribution has become the core feature of Philippine land reform programs with the approval of PD 27 in 1972 and RA 6657 or CARL in 1988. With these laws, funding for land redistribution increased significantly. Government total expenditure on land reform though remained at less than 0.5 percent of GDP. The financing for the program specifically in the last two decades has been dependent on proceeds from the sale of sequestered Marcos wealth. Overtime, these proceeds have dwindled. While budget augmentation from annual appropriations has been provided, the amount was just sufficient to fund operational support for DAR which implies lesser funds for land acquisition and distribution. Historically, government has had limited funding for land reform and it is unlikely that this will change in the future.

²⁶ "Just compensation" as defined by law means "*fair market value* or the price which a buyer will pay without coercion and a seller will accept without compulsion". Just compensation basically approximates the market value thus the presumption is that the landowner is paid the actual value of land.

²⁷Lands planted to naturally grown trees (e.g. narra, yakal) and the cost/value of permanent structures or improvements on lands are not covered by the amortization subsidy (DAR AO2 s.1998).

On the other hand, the cost to implement the program in particular CARP has been rising. A major cost component is the landowner's compensation (LOC). In contrast to PD 27, the CARL mandated landowners to be compensated at market value of the land which implies that government absorbs the difference in cost based on farm incomes and the market price of land. In the initial Phase of CARP, the LOC cost has been relatively low since the bulk of CARP accomplishments were non compensable lands, that is resettlement areas and VLT. However, as government moved to Phase II and started with the distribution of compensable and more productive lands, the average LOC per hectare more than doubled. The higher LOC from CARP does not imply more productive lands than PD 27. On the contrary, analysis of land valuation shows that lands covered under PD 27 are mostly irrigated rice lands with yields higher than average while lands redistributed under CARP show lower productivity.

Aside from a higher LOC, it has become costly to subsidize land processing and titling. About 50% percent of total program cost is attributed to land processing and other LAD related activities. The proportion is higher for PD 27 but this was mainly due to high capital expenditure during the period. In contrast, the rising expenditure in real terms of CARP has been traced to the average costs of land survey and title generation which more than doubled in Phase II of the program.

The administrative costs to maintain the DAR bureaucracy has also increased significantly. On the average about 77 percent of the costs of land processing is operational expense, the bulk (or 74%) of which is allocated to DAR to support its operation. In the last two years of CARP Phase II, almost 97% of operational cost has been obligated to DAR. Operational cost has increased substantially despite lower accomplishments in the latter phase of CARP.

Expenditure on AJD has also ballooned as the coverage of private lands under compulsory acquisition increases and more landowners resort to legal arguments to delay the land redistribution process.

The new law on CARP's 5 year extension has been passed without major changes in the implementation of the program. Moreover, the remaining lands to cover are mostly private lands which are targeted for compulsory acquisition. The next phase of CARP would require higher LAD expenditure both in terms of payment to landowners and the administrative cost of implementing the program. The average cost to implement land redistribution is estimated at P36,560 in 2007 prices and land cost of P113,700 in 2007 prices. Considering that about 1.3 million hectares of private lands have yet to be distributed, the budget requirement would amount to about P195 billion higher than the P150 billion extension budget. This amount is the minimum since it does not include increase in bond interest rates and the cost of agrarian justice delivery which has ballooned in Phase II of CARP and is expected to increase as DAR focuses on lands under compulsory acquisition.

The value of direct subsidies received by beneficiaries of land redistribution is significant amounting to P52 billion for PD 27 and about P36 to P42 billion for CARP. However, one has to consider fiscal constraints and political realities in the extension of the program. Several studies have shown that there are alternative ways to land redistribution and alternative programs to achieve land equity and poverty reduction. An alternative scheme to land redistribution espoused by the World Bank (World Bank 2008) is negotiated land reform which would allow for flexible contractual arrangements between tenants and landowners and decentralized and community managed approaches. These schemes will minimize deadlock caused primarily by land valuation issues. The valuation formula adopted for CARP proved to be complex with government paying the full amount of land cost subsidy. On the other hand, a departure from just compensation is unconstitutional. A negotiated arrangement could provide strategies that will allow land transfers which will match the capacities and productivity of tenants. The landowner and tenant can share in the cost of land with government subsidy limited to administrative costs and credit subsidy. These schemes can move CARP to a fiscally sustainable path.

The current system of government purchase of land on the basis of just compensation can also have distortive effects. Government will contribute to rising values of agriculture land thus making it difficult for the next generation of farmers to buy land because values rise faster than productivity and inflation.

Tax policy is another alternative to land reform or land redistribution to achieve equity objectives. Government can use the tax system to constrain rapid increase in agricultural land prices as well as limit land concentration. A tax policy is not only cost effective but revenue generating thus unburdening government from fiscal pressures.

There is also a need to rationalize the DAR bureaucracy and identify areas for cost reduction. In particular, DAR's administration on legal assistance and adjudication should be reviewed. The DAR has several layers of adjudication from the provincial, regional and national levels. Leonen (2007) argued that under this arrangement, government pays for the time of the adjudicators no matter how private the benefits of the conflict thus government end up subsidizing both the farmer and landowners. Arbitration would be a more cost effective arrangement specifically for disputes which are agrarian in nature. Arbitration has been shown to reduce the layers of dispute processing and allows costs to be allocated such that it will be borne by the private parties when the benefits are purely private. Consequently, the State has to move towards a leaner DAR bureaucracy as land redistribution is completed. The development of the agrarian sector can be merged with programs of the Department of Agriculture and local government units.

References

Alston, J. (1986). An Analysis of Growth of U.S. Farmland Prices, 1963-82. <u>American Journal of Agricultural Economics</u>, 1-9.

Arlanza, R. et.al. (2006). <u>The Comprehensive Agrarian Reform Program: Scenarios and Options</u> for Future Development.DAR and GTZ (German Technical Cooperation). Quezon City: Department of Agrarian Reform.

Balisacan, A (2009). Pathways Out of Poverty: Is Agrarian Reform Passe? Paper Presented at the 6th Ayala Corporation-UPSE Economic Forum UP School of Economics Auditorium 10 July 2009

Borras, S.J. (2000). <u>CARP in its 12th year: A Closer Examination of the Agrarian Reform</u> <u>Performance.</u> [Unpublished Paper]

Borras, S.J. (2005). Can Redistributive Reform be Achieved via Market-based Voluntary Land Transfer Schemes? Evidence and Lessons from the Philippines. <u>The Journal Development Studies, 41 (1)</u>: 90-134.

COA (2006). <u>Utilization of the Forfeited Swiss Deposits for the Implementation of the</u> <u>Comprehensive Agrarian Reform Program (CARP).</u> Quezon City: Commission on Audit.

COA (2007). <u>Consolidated Annual Audit Report on the Department of Agrarian Reform.</u> Quezon City: Commission on Audit.

Colyer, D., Phipps, T., Shi, Y.J. (1997). Agricultural Land Values under Urbanizing Influences. Land Economics, 73 (1): 90-100. October 12, 2009 http://www.jstor.org/stable/3147079>.

Cordova, V., David, C and Otsuka, K. (1992). Green Revolution, Land Reform and Household Income Distribution in the Philippines. <u>American Journal of Agricultural Economics</u>, 719-741.

DAR (1973). Presidential Decree No. 251. November 2009 < <u>http://www.lawphil.net</u>>.

DAR (1990). Executive Order No. 407. November 2009 <<u>http://www.lawphil.net</u>/executive/execord/eo1990/eo_407_1990.html>.

DAR (1991). Administrative Order No. 01. Quezon City: Department of Agrarian Reform.

DAR (1994). Administrative Order No. 13. Quezon City: Department of Agrarian Reform.

DAR (1995). An Assessment of the Operationalization of Leasehold System in Selected Tenanted Coconut Lands. Quezon City: Department of Agrarian Reform.

DAR (1998). The Agrarian Situation in Coconut Lands. Quezon City: Department of Agrarian Reform.

DAR (1998a). Administrative Order No. 02. Quezon City: Department of Agrarian Reform.

DAR (1998b). Administrative Order No. 05. Quezon City: Department of Agrarian Reform.

DAR (2004). Administrative Order No. 02. Quezon City: Department of Agrarian Reform.

DAR (2006a). Annual Report. Quezon City: Department of Agrarian Reform.

DAR (2006b). <u>Adequate Funding for Landowners Compensation</u>. Quezon City: Department of Agrarian Reform.

DAR (2006c). <u>Comprehensive Agrarian Reform Law</u>. Quezon City: Department of Agrarian Reform.

DAR (2006d). <u>Comprehensive Agrarian Reform Program: Book 1 Implementing Rules and</u> <u>Procedures</u>. Quezon City: Department of Agrarian Reform.

Deininger, K., Olinto, P. and Maertens, M. (1999). <u>Redistribution, Investigation and Human</u> <u>Capital Accumulation: The Case of Agrarian Reform in the Philippines</u>. Washington, D.C.: The World Bank

David, C. (2010). Monitoring and Evaluation of Agricultural Policy Indicators. Draft Main Report. <u>Philippine Institute for Development Studies and World Bank. Manila, Philippines Draft Report.</u>

De Leon, M.S.J (1983). Government Expenditures and Agricultural Policies in the Philippines, 1955-1980. <u>Philippine Institute for Development Studies Working Paper No. 83-06</u>.

DENR (1936). Commonwealth Act No. 141. October 2009 <<u>http://r1.denr.gov.ph/llaws-ca.html</u>>

DENR (1992). Friar Lands Act: Act No. 1120. October 2009 http://www.chanrobles.com/acts/actsno1120.html

Estudillo, J. and Otsuka, K. (1999). Green Revolution, Human Capital, and Off-Farm Employment: Changing Sources of Income among Farm Households in Central Luzon, 1966-1994. Economic Development and Cultural Change, 47(3): 497-523.

Estudillo, J. and Otsuka, K. (2001). Has Green Revolution Ended? A Review of Long-Term Trends in MV Adoption, Rice Yields, and Rice Income in Central Luzon, 1966-99. J. Rural Econ., 3: 51-64.

Estudillo, J., Otsuka, K. and Quisumbing, A. (2001). Income Distribution in Rice-Growing Villages during the Post-Green Revolution Periods: The Philippine Case, 1985 and 1998. <u>Agricultural Economics, 25:</u> 71-84.

Fabella, R (2009) CARP Without COASE: Redistributing Poverty? Working Paper School of Economics. University of the Philippines, Diliman.

Hayami, Y., Quisumbing A., and Adriano, L. (1990). <u>Toward the Alternative Land Reform</u> <u>Paradigm. A Philippine Perspective.</u> Quezon City: Ateneo de Manila University Press.

Inoferio, J. (1979). Distribution of Public Agricultural Lands in Palawan, 1951-1975. <u>MA</u> <u>Thesis</u>. Quezon City: University of the Philippines.

Iyer, L. and Maurer, N. (2008). The Cost of Property Rights: Establishing Institutions on the Philippine Frontier Under American Rule, 1898-1918. <u>Harvard Business School Working Paper</u> 09-023.

James, W. (1979). An Economic Analysis of Public Land Settlement Alternatives in the Philippines. <u>PhD Dissertation</u>. Hawaii: University of Hawaii.

Jatileksono, T. and Ostuka, K. (1993). Impact of Modern Rice Technology on Land Prices: The Case of Lampung in Indonesia. <u>American Journal of Agricultural Economics 75:</u> 652-665.

Land Bank of the Philippines (1972-2008). Annual Reports. Manila: Land Bank of the Philippines.

Leonen, Marvic M.V.F. (2008). CARP Institutional Assessment in a Post-2008 Transition Scenario: Reforms for the Agrarian Justice System. <u>Philippine Institute for Development Studies</u> <u>Discussion Paper No. 2008-10</u>.

Lins, D., Robison, L. and VenKataraman, R. (1985). Cash Rents and Land Values in U.S. Agriculture. <u>American Journal of Agricultural Economics:</u> 798-805.

Manasan, R. and Mercado, R. (2003). An Evaluation of the Fiscal Aspect of the Comprehensive Agrarian Reform Program (CARP). <u>CARP Impact Assessment Study, 6</u>. Quezon City: Department of Agrarian Reform, Quezon City.

Melichar, E. (1981). Capital Gains versus Current Income in the Farming Sector: Reply. <u>American Journal of Agricultural Economics:</u> 734-737.

Phipps, T. (1984). Land Prices and Farm-Based Returns. <u>American Journal of Agricultural</u> <u>Economics, 66(4)</u>: 422-429. October 10, 2009 http://www.jstor.org/stable/1240920.

Putzel, J. (1992). <u>A Captive Land: The Politics of Agrarian Reform of the Philippines.</u> Quezon City: Ateneo de Manila University Press.

Reinsel, E. and Reinsel, R. (1979). The Economics of Asset Values and Current Income in Farming. <u>American Journal of Agricultural Economics</u>: 1093-1097.

World Bank (2008). <u>Land Reform, Rural Development, and Poverty in the Philippines:</u> <u>Revisiting the Agenda.</u> Manila: World Bank.

		PD	27		CARP(w/o OLT)				
Year	Other LAD			1.00					
	Total	LPC	AJD	LOC	Total	LPC	AJD	LOC	
1972	50.86	43.04	7.81						
1973	81.56	74.00	7.56						
1974	169.83	160.51	9.32	4.06					
1975	232.13	220.90	11.23	24.08					
1976	181.77	169.28	12.50	42.53					
1977	344.63	327.93	16.70	52.12					
1978	334.00	317.00	17.00	71.45					
1979	338.00	318.00	20.00	82.82					
1980	363.29	338.02	25.27	79.02					
1981	383.97	380.60	3.37	85.16					
1982	245.78	241.84	3.95	82.79					
1983	257.78	257.78	-	102.50					
1984	339.58	339.58	-	102.93					
1985	209.30	209.30	-	112.68					
1986	384.32	384.32	-	108.46					
1987	-	-	-	221.34					
1988	150.06	140.62	9.43	243.23	195.31	193.53	1.78	94.26	
1989	392.14	382.24	9.90	429.10	534.51	532.56	1.95	114.78	
1990	208.46	197.22	11.23	534.66	975.79	954.23	21.56	59.61	
1991	56.28	53.54	2.74	139.93	1,318.26	1,286.71	31.55	870.42	
1992	61.09	59.63	1.46	256.18	1,192.00	1,178.28	13.72	1,319.30	
1993	57.80	55.74	2.06	236.57	1,340.72	1,317.41	23.31	1,437.55	
1994	59.79	58.51	1.28	344.58	1,565.65	1,549.38	16.27	1,720.19	
1995	86.94	84.58	2.36	294.88	1,884.92	1,860.16	24.76	2,059.76	
1996	71.17	69.21	1.95	401.97	2,101.30	2,073.05	28.24	2,338.64	
1997	65.56	65.46	0.11	334.47	2,084.76	2,083.09	1.68	2,283.09	
1998	90.74	89.77	0.96	268.42	2,795.05	2,780.61	14.44	2,829.61	
1999	80.55	78.10	2.45	270.48	2,705.28	2,664.78	40.51	3,177.36	
2000	93.48	90.82	2.66	241.69	3,316.01	3,269.38	46.63	3,432.09	

Annex A. LAD Expenditure by Program (PM in current prices)

2001	84.63	82.43	2.20	245.98	2,997.59	2,959.27	38.31	3,666.82	
2002	66.02	64.72	1.30	166.02	2,770.14	2,743.20	26.93	3,390.74	
2003	54.48	53.26	1.23	159.18	2,684.45	2,654.53	29.92	3,361.33	
2004	64.67	63.06	1.61	159.38	4,040.46	3,990.41	50.05	3,436.11	
2005	58.59	56.69	1.90	160.22	4,077.70	4,011.42	66.28	3,572.91	
2006	86.70	66.55	20.15	200.31	4,355.04	3,791.31	563.73	3,529.07	
2007	89.03	85.18	3.86	304.56	4,383.62	4,288.42	95.19	4,325.29	
2008	65.34	61.43	3.91	174.75	5,297.12	5,135.81	161.31	2,364.53	
Total	5,960.33	5,740.88	219.45	6,738.48	52,615.66	51,317.55	1,298.11	49,383.47	
Grand Total		13, 10	00.05		101,999.13				

Source: BESF, ARF

Annex B. Land Redistribution Accomplishments Approved by EBT for EGO										
Veer		PD 27		CARP						
rear	DAR(has.)	LBP(has.)	%Approved	DAR(has.) ^a	LBP(has.)	%Approved				
1974	237,121	6,548	2.76							
1975	77,790	27,681	35.58							
1976	29,875	26,884	89.99							
1977	33,642	28,978	86.14							
1978	44,241	31,806	71.89							
1979	46,812	33,450	71.46							
1980	53,520	19,230	35.93							
1981	26,556	15,180	57.16							
1982	74,907	21,251	28.37							
1983	54,544	20,126	36.90							
1984	44,717	21,013	46.99							
1985	19,765	7,346	37.17							
1986	11,458	7,768	67.80							

Annex B. Land Redistribution Accomplishments Approved by LBP for LOC

1987		7,213				
1988		3,406		-	1,320 *	-
1989		6,591		4,946	1,763	35.64
1990		6,942		12,516	774	6.18
1991		20,121		55,311	125,156	226.28
1992		18,765		76,223	96,639	126.78
1993		14,258		107,262	86,642	80.78
1994		12,002		79,843	59,916	75.04
1995		10,477		67,841	73,184	107.88
1996		12,457		86,053	72,474	84.22
1997		10,128		64,801	69,134	106.69
1998		7,433		58,776	78,358	133.32
1999		5,145		54,714	60,440	110.47
2000		3,241		43,951	46,023	104.71
2001		2,920		49,764	43,529	87.47
2002		2,120		47,850	43,297	90.48
2003		2,032		45,911	42,908	93.46
2004		1,348		46,893	29,061	61.97
2005		1,489		46,542	33,205	71.34
2006		1,912		38,643	33,686	87.17
2007		2,483		35,832	35,263	98.41
2008		1,654		25,773	22,380	86.84
Total	754,948	421,398	55.82	1,049,445	1,053,832	100.42

Source: DAR-PARC, Landbank Annual Reports

^a refers only to accomplishment based on CA, VOS, GFI

* initially identified as PD 27 but was considered for coverage under CARL

Voor	Avera	age Palay	Irriga	ated Palay	Raint	ed Palay	Corn		Corn Coconut		Sugar	
i cai	Mt/ha.	P/Ha.	Mt/ha.	P/Ha.	Mt/ha.	P/Ha.	Mt/ha.	P/Ha.	Mt/ha.	P/Ha.	Mt/ha.	P/Ha.
1972	1.51	900.92	1.93	1,751.79	1.33	738.00	0.80	538.82	4.29	739.53	56.23	4,932.20
1973	1.60	1,127.26	2.00	1,976.86	1.41	647.37	0.75	575.70	3.68	1,286.41	61.44	6,051.94
1974	1.57	1,250.67	2.07	2,410.71	1.33	997.73	0.68	740.99	2.71	1,444.28	71.08	6,125.09
1975	1.76	1,444.15	2.31	2,865.26	1.49	1,290.40	0.76	954.19	4.04	937.06	66.91	5,830.33
1976	1.79	1,600.93	2.32	3,173.77	1.51	1,298.16	0.81	1,156.55	4.56	984.06	67.61	8,299.69
1977	1.96	1,695.46	2.56	3,360.21	1.66	1,514.55	0.89	1,348.49	3.79	1,376.33	60.75	8,467.94
1978	2.03	1,864.33	2.67	3,639.82	1.68	1,471.47	0.90	1,433.09	3.56	2,090.94	58.59	7,118.11
1979	2.17	1,937.87	2.95	3,939.68	1.70	1,522.48	0.93	1,497.54	2.76	2,677.35	70.67	8,852.39
1980	2.20	2,165.35	2.80	4,331.47	1.80	1,770.92	0.95	1,758.58	2.82	2,553.86	72.77	9,351.18
1981	2.31	2,702.32	2.89	5,332.56	1.88	2,231.28	1.00	2,076.67	3.05	2,350.68	79.01	20,167.57
1982	2.49	3,091.62	3.07	6,166.10	1.96	2,451.12	1.01	2,242.22	2.84	1,928.97	85.96	11,147.61
1983	2.39	3,397.66	2.93	6,743.63	1.83	2,343.05	1.00	2,263.10	2.66	2,549.38	69.76	11,674.40
1984	2.48	5,767.55	2.93	11,288.17	2.02	3,750.07	1.01	4,128.40	1.87	6,883.06	83.76	16,372.12
1985	2.66	8,685.61	3.17	17,123.50	2.12	6,563.12	1.10	5,270.31	2.63	5,492.02	61.98	15,707.36
1986	2.67	7,588.36	3.18	15,248.67	2.16	6,096.20	1.14	4,828.65	3.43	3,753.96	69.94	16,802.06
1987	2.62	7,781.40	3.14	15,870.30	2.02	5,946.63	1.16	5,500.69	3.23	4,602.15	63.92	23,057.53
1988	2.64	8,674.92	3.12	17,173.03	2.05	6,805.19	1.18	5,552.25	2.47	5,966.19	89.50	42,674.83
1989	2.70	10,032.41	3.19	20,354.05	2.04	8,321.69	1.23	8,184.79	2.53	7,214.39	96.52	49,113.99
1990	2.81	11,790.07	3.29	22,735.97	2.13	9,789.35	1.27	8,184.29	3.54	6,023.95	80.03	35,762.23
1991	2.82	11,157.77	3.32	22,360.86	2.15	9,412.54	1.30	7,869.16	2.79	6,132.27	68.91	40,573.26
1992	2.85	12,105.37	3.34	23,634.97	2.10	9,736.83	1.39	10,872.75	3.05	7,487.88	81.11	38,607.57
1993	2.87	14,494.17	3.34	28,149.98	2.19	11,372.96	1.52	13,024.04	3.68	7,514.84	77.47	34,610.39
1994	2.89	15,772.94	3.38	31,151.16	2.16	11,855.05	1.50	12,041.73	3.66	7,466.80	66.46	45,500.02
1995	2.80	21,012.71	3.26	40,612.77	2.11	15,223.59	1.53	15,662.55	3.98	6,838.08	65.05	35,065.77
1996	2.86	23,358.88	3.31	46,879.20	2.16	16,906.80	1.52	16,495.19	3.79	8,700.37	67.21	42,115.05
1997	2.93	24,026.07	3.39	48,175.08	2.14	16,438.98	1.59	16,698.79	4.14	9,704.77	76.71	43,662.09
1998	2.70	23,835.85	3.06	45,446.78	1.92	15,372.09	1.62	15,131.30	3.43	10,786.28	76.50	41,365.64
1999	2.95	26,692.45	3.35	53,729.57	2.18	16,908.96	1.74	17,492.35	2.97	10,274.04	75.76	59,778.07
2000	3.07	30,572.34	3.48	60,900.94	2.23	18,778.40	1.80	19,843.03	4.17	8,532.83	62.01	38,481.22
2001	3.19	29,991.40	3.59	58,799.13	2.36	19,315.36	1.82	20,070.20	4.18	7,682.13	69.76	49,355.10
2002	3.28	32,704.59	3.68	64,687.66	2.48	21,861.95	1.80	19,683.38	4.42	11,308.20	71.66	61,296.56
2003	3.37	33,192.66	3.77	62,865.08	2.52	22,305.60	1.92	21,689.48	4.45	12,140.87	80.75	61,210.76
2004	3.51	35,810.68	3.92	68,691.52	2.66	25,163.93	2.14	30,929.87	4.41	15,871.41	86.72	55,946.55
2005	3.59	40,551.25	4.02	77,357.25	2.63	27,481.72	2.15	26,552.30	4.57	16,272.27	85.11	61,495.76
2006	3.68	41,312.06	4.10	80,014.71	2.80	29,304.10	2.37	35,446.02	4.48	15,059.30	80.30	84,402.34
2007	3.80	46,281.14	4.21	88,641.22	2.93	32,858.75	2.54	41,174.55	4.42	17,771.65	58.06	75,480.97
2008	3.77	55,613.54	4.14	105,470.42	2.98	42,345.13	2.60	49,138.90	4.53	23,706.30	66.84	84,885.71

Annex C. Average Gross Production(Mt) and Average Value of Gross Production(Php), per Hectare by Crop

Source: BAS

Rice															
Factor	Central Luzon Loop ¹			IRRI Survey					1985 DIS survey						
	1986/1987	1998/19	99	1	985			1998		Favorable		rainfed Unfav		avorable rainfed	
				CL	Par	nay	CL	Pana	y (CL2		P2			P3
Factor shares															
Total Revenue	100	100		100	10	00	100	100		100		100		1	00
Current inputs	20	24		29	2	1	17	27		29		18		2	22
Capital	10	11		15	1	1	6	11		13		8			13
Owned	4	4		4	2	2	1	1		4.0		2.1		Ę	5.6
Hired	7	7		11	ç)	5	10		8.9		6.3		7	7.4
Labor	22	32		26	2	9	26	40		26		26			46
Family	5	6		12	1	0	5	9	1	2.9		8.4		2	5.9
Hired	17	27		14	1	9	21	31	1	2.9	1	17.9		2	0.4
Land	48	34		30	3	9	51*	22**		33		47			19
Residual	35	24		17	2	1	41	6	1	4.9	1	15.8		2	4.1
Leasehold rent	13	10		13	1	8	10	16	1	7.8	3	31.6		-:	5.6
Coconut															
		Fa					Farm	arm Size							
		50			Smal	1		Mediun					La	rge)
			F	P/hectar	re		%								
Total Revenue			1	0,597.0	00		100								
Total Expense				3,718.0	0	3	85.09								
Inputs				157.00	1		1.48								
Labor			:	3,267.0	0	30.83									
Transport				253.00)	2	2.39								
Other cost				41.00		(0.39								
Land			6	6,879.0	0	6	4.91								
Residual			4	4,049.0	0	3	8.21								
Land Rent			2	2,830.0	0	2	6.71								
Sugarcane															
Total Revenue	80,389.86	100	7	75,722.5	52		100	80,	154.05	10	00	85,29	93.01		100
Total Evenena	50.045.04	70.05		F7 07/	1.05		70 40		0 004 54	70	64		054.07		70.00
I otal Expense	58,915.91	73.35	4	57,87	1.95	1	0.43	5	6,621.51	10.	64 60	62,	254.27		72.99
Inputs	14,721.15	18.39		4,900.8	0	1	9.08	15,	775.94	19.	68	13,48	00.00		15.81
	20,0/1.0/	35.97		0,310.5	0 0	3	1.39	28,	20.24	35.	0Z	29,58	00.00		34.70
	0,031.39 6 404 50	0.99	<u>،</u>	5,017.1	0 2	1	1.04	8,1	30.31	10.	14	9,54	0.09		11.19
Other Cost	0,491.50	δ.Uδ	<u> </u>	5,842.8	3		1.12	4,0	07.50	5.0	0	9,62	4.17		11.28
Land	26.605.89	33,10	2	2.475.5	57	2	9.68	29 !	532.54	36	84	27.80)9.57		32.60
Residual	21,473,95	26.65	1	7.850 5	57	2	3.57	23 !	532.54	29	36	23.03	38.74	-	27.01
Land Rent	5 131 94	6 40		1 625 0	0	6	3 11	60	00.00	74	19	<u></u> , oc	0.83		5.59
	0,101.04	0.10		4,625.00		, t	~	0,0	00.00	u 7.49		4,770.83			0.00

Annex D. Factor Shares (%) to Gross Revenue per hectare

References:

- a Estudillo, J., and Otsuka, K., (2001). Has Green Revolution Ended? A Review of Long-Term Trends in MV Adoption, Rice Yieds, and Rice Income in Central Luzon, 1966-99. *Jpn. J. Rural Econ.*3, 51-64
- b Estudillo, J., Quisumbing, A., and Otsuka, K., (2001). Income distribution in rice-growing villages

during the post-Green Revolution periods: the Philippine case, 1985 and 1998. *Agricultural Economics*. 25, 71-84

- c David, Cristina C., V.G. Cordova, K. Otsuka (1994), "Technological Change, Land Reform, and Income Distribution in the Philippines", in C.C. David and K. Otsuka, Modern Rice Technology and Income Distribution in Asia, Lynne Riener Publishers and International Rice Research Institute
- d Sugar Regulatory Commission
- e DAR (1995). An Assessment of the Operationalization of Leasehold System in Selected Tenanted Coconut Lands. Quezon City: Department of Agrarian Reform
- f DAR (1998). The Agrarian Situation in Coconut Lands. Quezon City: Department of Agrarian Reform

Not

- e:
- ¹ Average Dry and Wet Seasons
- * increased yields due to improved technologies
- ** decreased yields due to drought

	Actual Co	llection (PM)		
Year PD 27		CA, VOS,	Total Ammortization Due and	Collection Rate(%)
		VLT	Collectible (PM)	
1974	9.02		39.18	2.97
1975	11.93		241.27	0.60
1976	13.06		403.72	1.05
1977	14.33		586.62	1.21
1978	16.00		826.43	1.35
1979	17.77		1,078.94	1.51
1980	19.79		1,192.67	1.66
1981	20.80		1,345.55	1.91
1982	23.63		1,497.25	1.53
1983	25.69		1,659.88	1.53
1984	27.38		1,825.61	1.53
1985	28.13		1,894.35	1.53
1986	28.56		1,910.12	2.01
1987	0.00		1,970.17	1.50
1988	5.56	1.64	2,001.19	3.90
1989	7.31	37.03	2,006.78	25.30
1990	9.43	5.67	2,013.32	16.80
1991	8.61	6.33	2,053.66	18.30
1992	6.78	10.33	2,090.00	13.60
1993	7.51	53.97	2,119.21	14.00
1994	8.02	21.93	2,064.03	38.60
1995	11.04	37.90	494.00	38.10
1996	10.51	49.05	552.00	30.60
1997	10.17	74.58	999.68	31.10
1998	16.09	64.32	1,038.93	28.00
1999	15.01	524.09	732.00	21.30
2000	10.25	140.07	796.24	18.60
2001	11.10	216.47	792.61	17.60
2002	13.44	170.56	883.08	19.50
2003	11.68	174.54	1,008.92	15.70
2004	14.23	186.41	1,013.11	20.60
2005	10.80	197.34	828.28	29.00
2006	12.69	192.98	1,179.50	25.00
2007	21.24	209.55	1,748.14	23.70
2008	12.25	239.47	1,995.55	27.37

Annex E. Schedule of Land Amortization Collectibles and Actual Collections by LBP

Source: LBP Annual Report and Strategic Planning Group, LandBank
ANNEX 5: GENERAL SERVICES SUPPORT

1. RDER expenditures

Expenditure trends

Figure A5. 1 shows the trends in the combined public expenditures for R&D, extension, and regulatory services (RDER), disaggregated between the national government and LGUs after the devolution of DAs front-line services in 1993¹. Expenditures for RDER grew rapidly from 1975 to the early 1980s as the high rate of returns from investments in R&D was demonstrated clearly by the Green Revolution in rice². Increased expenditures during this period were allocated mainly for the creation of PCAR and the concomitant major push for the development of agricultural research in the major agricultural state colleges and universities, as well as for the establishment of the FPA and NMIS.

RDER expenditures declined in the early 1980s due to severe budgetary constraints, but slowly recovered after 1986. With the devolution in 1992, the RDER budget of national agencies decreased by 30 percent or by approximately P 500 million in 1985 prices, representing the amount of salaries saved from the transfer of around 75 percent of the personnel in regional offices to the LGUs. Subsequently, spending for RDER by national agencies rose to levels even higher than before devolution, because of the passage of AFMA, which emphasized the strengthening of the R&D. However, that growth was reversed in the early 2000, and by 2008 recovered again to the pre-devolution level of spending.

In the meantime, the LGUs budgetary outlays for agriculture-related functions, funded mostly through their Internal Revenue Allotments (IRA), increased to P 1.2 billion (1985 prices) by 2000, but that level has remained relatively constant since then. Consequently, public expenditures for RDER from 2002 to 2008 were just about equal to the peak levels reached in the early 1980s, after briefly exceeding them in the late 1990s. Since the devolution, the LGU agriculture-related spending averaged about 40 percent of the RDER expenditures. As noted earlier, however, that share is only about 12 percent in comparison to total public expenditures for agriculture

RDER intensity ratios

Despite the apparent recovery of total spending for RDER in the late 1980s, the ratio of RDER expenditures to gross value added in agriculture (GVA) has declined since the 1980s, especially the expenditure by the national government (Figure A5. 2). Average ratio of RDER to GVA was around two percent in the 1960s and 1970s. This ratio dropped to one percent in the 1980s, and recovered to some extent due to increased expenditures of the LGUs and higher budgetary outlays for R&D from the late 1990s up to 2001. However, the recovery was not sustained as the average ratio of RDER to GVA in recent years fell again to slightly higher than one percent.

Table A5. 1compares the ratios of expenditures for RDER to GVA to similar ratios for agricultural R&D (research intensity ratios or RIR) estimated in three previous studies (David et al 1998; Stads et al 2007; World Bank 2007). Both David et al and Stads et al studies covered not just agriculture, but also R&D for fisheries and forestry. The Stads et al's estimates were based on survey data of individual R&D institutions and covered more institutions than those included in this study (MEAP), World Bank's AgPER, and the earlier David et al's study, particularly in relation to SCUs. The MEAP and David et al's studies have similar coverage of institutions, but the latter pertained to expenditures for R&D only based on data directly requested by the DBM from the concerned agencies. In the World Bank study, the data were obtained from the DA and the DOST and did not include the SCUs.

In general, the ASTI estimates of research intensity ratios were significantly higher than estimates in David et al and World Bank estimates, which can be explained in part by the difference in coverage³. Even taking the relatively high ASTI estimate of RIR (0.46%) in 2002, this was slightly lower than the overall average for the developing countries (0.53%). The RIRs of Malaysia (%) and Thailand (%) are nearing the average level of developed countries of 2.36 percent (Pardey et al 2006).

The declining trend in the ASTI estimates of RIR is consistent with the long- term declining pattern of the RDER intensity ratio. Based on the relative values of the RIR to the RDER intensity ratio, expenditures for agricultural research would constitute about 25 to 35 percent of total RDER spending. However, the country's spending for extension as ratio to GVA

of less than one percent in recent years is significantly below the available estimate for developing countries of close to two percent back in the late 1980s (Swanson, Farmer, and Bahal 1990).

Clearly, agricultural research, extension, and regulatory services in the country have increasingly been severely underfunded since the 1980s. The opportunity cost of under-investing in these core functions of agricultural governance is high. The review of 289 studies worldwide indicates that the median economic rates of returns on public investments for agricultural R&D is 49 percent, extension 58 percent and research and extension combines as 36 percent (Alston et al 2000). The problem, however, is not only with the low level of public expenditure, but equally important are the inefficiencies caused by the misallocation (e.g., across commodities, program areas, and ecological regions) and inefficient budgetary structure (e.g., distribution of budget among personnel salaries, operation and maintenance, and capital outlay) and processes (e.g., delays in release of funds) of the RDER resources.

Public expenditures for RDER cover the personnel salaries of the vast majority of the agricultural bureaucracy outside NFA, NIA, DAR, and a few small units of the DA such as ACPC, QUEDANCOR, BAS, etc. However, a substantial number of the staff under the RDER agencies, especially the regional offices and the LGUs, performs functions that, strictly speaking, are not be related to the provision of public goods and services. The time allocation of these personnel resources have often been diverted to the administration and distribution of public expenditures for production support, which as discussed in the following section are largely private goods in nature. Hence, the estimated RDER intensity ratios even understate the severity of the underfunding of the RDER services for the country's agricultural sector.

2. All Production Support

Trends in all production support

The broad category all production support (APS) consists mostly of public expenditures for the provision of private goods such as fertilizers, hybrid seeds, postharvest facilities and equipment, farm machineries, livestock, and others. A relatively small portion of these expenditures were spent in addressing market failures and providing public goods, such as those for rural credit, farm to market roads, and other market infrastructure. In most cases, however, the manner of their implementation has significantly diminished the value to recipients of these expenditures due to graft and corruption and/or has served the interests of the wealthier segment of the agricultural sector rather than small farmers.

Expenditures for production support have been usually funded through lump-sum appropriations, and thus it was often not possible to estimate separately the expenditures for each of the different items included in the category all production support over the whole study period. Indeed, these different items of expenditures had to be combined because of the lack of disaggregated expenditure data for lump-sum appropriations as well as integrated development projects. Nonetheless, expenditures for market infrastructure, credit/crop insurance, postharvest facilities and equipment, and production support (seeds, fertilizers, animals, others) were estimated separately whenever these can be identified from the line items in the GAA, the planning figures of the various commodity programs (i.e., rice, corn, high value crops, and livestock), and the distribution of the CARP's funds for beneficiary development. These estimates represent the minimum amounts for each of these categories as more expenditures for the different production support items are allocated through the following two other categories.

Budgetary allocations for locally and foreign assisted projects that finance a mixture of selected production support items that cannot be disaggregated have been combined in the subcategory called integrated production support (IPS). Examples of these are the Agrarian Reform Communities Project funded by the World Bank and the Asian Development Bank, the Palawan Integrated Area Development Project, special lump-sum projects of DAR, and so forth⁴.

The sub-category residual refers to expenditures that are not explicitly specified in the GAA, but are funded through automatic appropriations and budgetary transfers from special funds which are largely spent for production support items.⁵ Examples of these are the commodity grants administered by the NAFC, the Agricultural Competitiveness Enhancement Funds (ACEF), Priority Development Assistance Fund and other Congressional pork barrel funds, Calamity Funds, Poverty Alleviation Funds, and others.

Note that the inclusion of IPS and residual tends to overstate APS because portions, albeit small, of these amounts have been allocated for RDER. On the other hand, estimates of public expenditures for some of the specific production support items may themselves be understated. For example, rural credit is underestimated by the amount of contingent liabilities of the government due to the loans of the QUEDANCOR which are unlikely to be ever repaid from

its corporate operations. Expenditures for postharvest facilities by the NFA have not been included.

Figure A5. 3 presents the trends and composition of public expenditures for all production support disaggregated into market infrastructure, credit, postharvest facilities and equipment, production support, integrated production support and residual in 1985 prices. Expenditures for each of the first four specific categories are understated by the amounts lumped with projects under the integrated production support and the residual. Figure A5. 4 depicts the trends in the ratio of the public expenditures for all production support as ratio to gross value added in agriculture.

Annual average budgetary allocations for all types of production support in real terms increased four-fold between 1960-1985 and 1986-2008. In contrast to total public expenditure for agriculture, which as a ratio of gross value added in agriculture was generally higher in the 1970s up to the mid 1980s compared to later years; expenditures for all production support, as a ratio to GVA, was twice higher since the 1990s compared to earlier years. Consequently, the share of APS to total public expenditures for agriculture rose from an average of less than 10 percent from 1960 up to the late 1980s to 25 percent since the 1990s, reaching the highest share of 40 percent in 2008.

The nature of expenditures for production support also differed between the two subperiods. In the following sections, even without a consistent time series estimate of expenditures for specific items of production support over the whole study period, we raise questions as to whether and to what extent these are being spent efficiently, allocated for the provision of private instead of public goods, and redistributed resources in favor of the large versus the small producers.

Rural credit⁶

Government efforts to increase availability of low cost credit to the agricultural sector began in the early 1950s with the enactment of the Rural Bank Law which promoted the establishment of family-owned banks in each municipality⁷. At the same time, the Agriculture Credit Cooperative and Farmers' Association (ACCFA) was also established to develop small farmers' cooperatives that can serve as channels for government-financed unsecured production and marketing loans to small farmers. After a decade of serious default problems, the Agricultural Credit Administration (ACA), with a narrower mandate of credit provision for land reform beneficiaries, replaced the ACCFA. In the early 1970s, ACA was also abolished and the new Land Bank established to handle not only credit provision to small farmers, but also the collection of amortization payments by land reform beneficiaries and land payments to former landowners.

To promote the adoption of the new seed fertilizer technology in the early 1970s, supervised credit program in rice called the Masagana 99 Program was instituted that linked credit provision to purchase of modern varieties of seeds, fertilizers and other chemical inputs. In late 1972, rice production dropped by an unprecedented 20 percent due to the tungro and other disease problems, followed by extremely unfavorable weather conditions. In the face of a sharp increase in world prices of rice and fertilizers (due to the oil crisis) and the implementation of land reform in rice that removed landlords as source of credit, the Masagana 99 Program was expanded on a massive scale in 1973 and 1974. Supervised credit programs for corn, vegetables, and other commodities were also instituted, but on a much smaller scale.

The rural banks were the main conduits of these commodity-based credit programs. Aside from the preferential rediscounting facility at only 1 percent rate per annum compared to interest rates of 9 to 14 percent on savings and time deposits, the government provided loan guarantees for up to 85 percent of loan amounts. Yet, these credit programs were not sustainable in the medium term, because of very low repayment rates that weakened financial performance of participating financial institutions. When the cheap rediscount window closed in response to the country's overall economic and financial difficulties in the early 1980s, many rural banks became bankrupt.

To increase credit flow to the agricultural sector, PD 717 (commonly known as Agri-Agra law) was issued in 1975, which required the banking sector to allocate at least 25 percent of its loanable funds for agriculture, of which 10 percent of loanable funds should be lent to agrarian reform beneficiaries. Because compliance to this law may be achieved in terms of investments in government securities, there has been no perceptible increase in the share of agriculture to loans granted by the banking sector that can be attributed to the implementation of this law.

Financial reforms in the 1980s included the deregulation of interest rates, termination of subsidized rediscounting facilities, and transfer of the Central Bank's development financing

operations to the Development Bank of the Philippines and the Land Bank (including the World Bank funded Agricultural Loan Fund). In agriculture specifically, the 20 supervised credit programs existing in 1986 were terminated and remaining funds consolidated into the Comprehensive Agricultural Loan Guarantee Fund (CALF). This was intended to encourage banks to lend to small farmers by providing a guarantee cover of up to 85 percent of loan defaults of small farmers.

However, by the late 1980s, substantial budgetary allocations were again allocated for rural credit initially to the Land Bank as part of the beneficiary development programs of CARP. Various directed credit programs (DCPs) then proliferated with support from local and foreign assisted projects through new and automatic appropriations, as well as long-term borrowings by the QUEDANCOR (Llanto et al 1999)⁸. In 1999, there were 43 agricultural DCPs being implemented by at least 12 government non-financial institutions, including the DA regional field units, Philippine Carabao Center, ACPC, QUEDANCOR, National Dairy Authority, Bureau of Animal Industry, NAFC, Cooperative Development Authority, and others. The same 1999 study concluded that these programs were generally inefficient and ineffective, characterized by large default rates, political interventions, and poor program management.

The AFMA (1997) and EO 138 (1999) called for the termination of DCPs, including the CALF, and the consolidation of outstanding loan funds and any new funds for on-lending into the Agro-industry Modernization Credit and Financing Program (AMCFP). The AMCFP, in turn, shall be handed over to government financial institutions for wholesale lending to private financial institutions. The latter shall then undertake the lending operations at market interest rate to end-borrowers in the agriculture and rural sector. By limiting the administration of government credit assistance to financial institutions, efficiency in the operations of credit programs can be improved and with the existing regulatory framework in the financial sector, accountability can be enhanced.

Attempts to implement these policy reforms have largely failed, in part because QUEDANCOR continues to be considered a financial institution and thus allowed to administer loans directly. While some progress, albeit slow, is being made in consolidating some funds into the AMCFP, new and even larger DCPs have been implemented. Not only have these relatively new credit programs violated the credit reform agenda, COA annual audit reports of ACPC and QUEDANCOR (2005-2008) indicate that they have performed quite poorly. For example, the

QUEDANCOR in 2004 used borrowed funds from the commercial financial market to embark on the Swine Program that provided loans in kind to swine producers. By end of 2008, less than one percent of accounts receivables have been collected, making the recovery of the outstanding balance of P 1.437 billion extremely doubtful. The agency's recent Agriculture-Fishery Business Organization Program which distributed wholesale loans totaling nearly P 400 million to mostly new cooperatives for on-lending to end-borrowers is also expected to incur substantial losses. Repayment rates have averaged only 12 percent, while past due loans have already reached P220 million.

Even QUEDANCOR's loan portfolio that involved collaterals is likely to cause major losses for the agency. Loan amount is typically set equal to appraised value of the collateral; but COA found that average appraised value at time of foreclosure of delinquent loans has been way below (45%) the average appraised value at loan application. Given the high transactions cost of liquidating foreclosed collaterals, the government may be expected to recover only a small fraction of the agency's so-called secured loans.

Another clear example of highly questionable DCPs is the ACEF loan program administered directly by the ACEF Executive Committee, which has lent out a total of nearly three billion pesos by the end of 2008.⁹ These loans are relatively large (minimum of P500,000 and not exceeding P60 million), without any collateral requirement, free of interest charges, and payable in six years plus one year grace period. These loans financed livestock projects, agro-processing centers, post-harvest facilities, and so forth.

Ironically, the other ACEF loan program (totaling one billion pesos) for small farmers and fisherfolks coursed through QUEDANCOR charged a 12 percent interest rate and P 50,000 maximum loan value. Not surprisingly, the repayment rate has been very low, around 20 percent on the directly administered loan by ACEF and even less (%) for loans managed by the QUEDANCOR.

Since the 1960s, government sponsored credit programs have not been sustainable because of high default rates. At least in the earlier period, these credit programs primarily served small farmers rationed out of the formal financial market due to the high costs of transactions, information, and risks to lending to small farmers and thus may be considered addressing a market failure. Government-sponsored credit programs were also coursed mostly

through financial institutions where some measure of accountability and expertise in the business of lending existed.

Since the mid-1990s, a variety of non-financial government agencies, including QUEDANCOR, administered the larger share of government credit programs, frequently on an ad hoc basis. A growing proportion of these loans have been allocated to wealthier farmers and agri-business firms who have the collateral or the reputation to have access to the formal financial market. In other words, budgetary allocations for these programs provided private, rather than public goods.

Infrastructure

Budgetary outlays for market infrastructure, primarily farm to market roads (also public markets, etc), have been included in the agriculture budget only since the late 1980s. These were partly funded by the Agrarian Reform Fund and foreign assisted projects such as the series of Agrarian Reform Communities Projects aimed at providing support services for land reform program beneficiaries. For the most part, however, expenditures for market infrastructure have been funded by Congressional "pork barrel funds" inserted among locally funded projects of the Department of Agriculture, and disbursed geographically according to political criteria.

Investments in rural market infrastructure are undoubtedly a critical factor in agricultural development as reported in many empirical studies elsewhere (Fan et al 2000). It should be emphasized that growth in the public expenditures for market infrastructure in the agriculture budget is not necessarily a positive indication of an overall improvement in infrastructure development. Indeed, the country has fallen behind other ASEAN countries in infrastructure development since the 1990s, with infrastructure investments relative to GDP averaging only 2 percent compared to the 5 percent norm for other ASEAN countries (Llanto 2007).

There is no reason to believe that letting the agriculture bureaucracy handle portions of the market infrastructure budget, nor linking road building to land redistribution will improve allocative efficiency in infrastructure development. In fact, a number of COA special audit (2005;) and annual audit reports (2005; 2007) highlighted the poor quality of farm to market roads built by the pork barrel funds for infrastructure administered by the Department of Agriculture. Shifting part of infrastructure budget to agriculture agencies has likely crowded out potential budgetary resources for agriculture-specific, productivity enhancing policy instruments

that agriculture agencies are better equipped to administer. Moreover, it may have reduced the national and local public works agencies ability to efficiently plan and implement new construction of road networks, as well as improve the timeliness and adequacy of road maintenance.

Postharvest facilities and equipment

Except for research and development on certain postharvest and agro-processing problems and extension of improved management of these operations, the private sector may be expected to invest optimally in the purchase of postharvest and agro-processing equipment and facilities, which are essentially private goods. Indeed, given adequate level of intellectual property protection, the private sector tends to be more efficient in performing the strategic, applied, and adaptive phases of R&D in mechanical technologies (Binswanger). Yet, the government has allocated substantial resources for distribution of various types of grain dryers, establishment of municipal and farm level grain processing centers, agro-processing facilities, cold storage and freeze drying facilities, and others. Except for the construction of multipurpose pavements for drying palay, none of these expenditures has given any significant benefits to farmers.

The earliest failed public investments in postharvest and agro-processing facilities made in the early 1970s are not reflected in the data presented, because these were funded by loans guaranteed (and ultimately paid for) by the government. The first is the establishment of the Food Terminal, Inc. in Metro Manila, a major cold storage and food-processing facility that had never earned sufficient revenues even just to cover variable costs, and at least be able to maintain the equipment and facilities properly. The second are the large-scale rice milling and drying facilities set-up in various parts of the country by the private sector using foreign loans, which proved to be too big to be economically viable.

There is the mistaken notion that small-scale mechanical dryers can help farmers avail of the higher price of palay with lower moisture content. However, flash dryers, flat-bed dryers, and other types of small scale mechanical dryers distributed by the government since the late 1980s have hardly been utilized by farmers, because the cost of sun-drying continue to be cheaper than the cost of operating these machines. Even rice millers rely mainly on sun-drying, except during periods of continuous rainfall when the use of medium scale mechanical dryers becomes economical.

Another common mistake is the idea that farmers can actually benefit by participating in rice milling and other agro-processing ventures through cooperative enterprises. In the late 1980s, a large rice milling complex was built in Rizal as part of the government support for land reform beneficiaries. Subsequently, municipal and farm-level grain centers were established around the country funded by NAFC, ACEF, NFA, and other local sources. Food-processing plants were built in Pangasinan and the Ilocos provinces, as well as cold storage facilities in Benguet for flowers and vegetables and within fishing ports. Thus far, none of these public investments has proven economically viable, such that farmers can benefit on a sustained basis. Meanwhile, scarce government revenues have been mostly wasted.

The fact that the private sector has not invested in postharvest or agro-processing equipment and facilities of a certain type and at certain locations simply indicates that it is not economically profitable to do so. Neither can such public expenditures be justified on equity grounds, because only the suppliers and government decision-makers (through kickbacks) have benefitted from these expenditures at the expense of taxpayers.

Production support

The sub-category production support covers public expenditures for distribution of seeds and planting materials, fertilizers, pesticides, livestock, and so forth. Although these items are primarily private goods, there are at least four reasons why some subsidies may be justified on certain inputs, for certain groups of producers, and at certain points in time. First, to promote the use of new, productivity enhancing technologies, such as new high yielding varieties of rice and other crops, new types of fertilizers, and the like, government subsidies may be needed to pay for the cost of risk in trying out these new technologies and management practices.

Second, some inputs may have public good characteristics, such as in the case of inbred rice seeds where the private sector cannot be expected to produce the optimal amounts. Since farmers can reuse or save seeds from self-pollinated crops using inbred seeds without significantly lowering yields, the market for commercial inbred seeds is limited. Unless new and better varieties are developed rapidly, government subsidy for commercial inbred seeds may be called for on a continuing basis.

Third, use of some inputs may be subsidized to maximize their positive externalities. For example, planting materials for tree crops may be distributed free for upland farmers to protect the lowland farms and river systems from soil erosion. The public funds may be spent for disease control measures to protect other farms, the environment, and people's health.

Finally, government intervention through input subsidies may be needed to help small farmers cope with instabilities in agricultural production due to weather disturbances and insect and disease problems, because of market failures in credit markets and lack of crop insurance. The following discussion refers to largely to the production support for rice which account for around 80 percent of this sub-category, based on budgetary outlays for the commodity programs which is indicative of the commodity distribution of the expenditures for production support.

Prior to the 1990s, budgetary allocations for production support were relatively low except for the unusual years of 1973 and 1974, and much of these expenditures were justifiable. In the late 1960s, there was a need for the government to share in the cost of learning how to use the new rice seed-fertilizer technology introduced in the mid-1960s and the cost of risk associated with its adoption. Farmers were given one or two kilos of seeds (inbreds) of these successive generations of new varieties on a trial basis. Because of the significant yield advantage of these modern varieties, the government had to provide incentives to seed growers to quickly meet the strong demand of farmers for the seeds of the successive generations of modern varieties being developed at that time.

By the mid-1970s, the need for massive credit assistance and/or input subsidies under the Masagana 99 program became acute, after rice production fell by 20 percent, fertilizer price rose sharply, land reform took out landlords as source of credit, and the alternative of importing rice became too costly. However, as Fig._____ indicates, the massive scale of the program occurred only in one year, clearly as a valid response to a rice crisis. The subsidies were mainly in terms of low interest rates and non-repayment of loans; and for a couple of years, some price subsidies were relatively small, as farmers were willing to pay full cost for new varieties in the private seed market that quickly developed.

In contrast, the much higher expenditures for production support since the 1990s did not have the same economic rationale as those in the earlier period. By then, rice farmers were quite adept in the cultivation of modern varieties and use of fertilizers and other chemicals. There has also been no major technological breakthrough in varietal improvement nor crop management. After the three generations of modern rice varieties developed between 1965 and 1975 (highyielding and fertilizer responsive; better eating quality and resistance to selected insect and diseases; and shorter-growth duration), varietal improvements leveled off. Improved pest and crop management technologies saved on pesticides and other inputs, but required more intensive training and other extension activities. While production instabilities continued to be experienced, there has been no "rice crisis" of the scale and depth encountered in 1973/74. The public expenditures for production support since the 1990s have been private goods in nature, and at best redistributive in purpose.

However, recent detailed evaluation of the hybrid rice program (David 2006) and the series of special and annual audit reports of the COA related to production support for rice since 2005 raise questions not only with the economic rationale of these production support programs, but who actually benefits from these expenditures. Since 2001, the production support for rice had been centered around the massive promotion of hybrid rice seeds. Unlike the inbred rice seeds which can be reused or grown by farmers, the cost of hybrid seeds is not only higher, these have to be purchased each crop season to maintain its yield advantage. Because breeders have a natural or biological protection (property rights) against uncompensated use of their hybrid crosses, and the seed market is potentially large as farmers will have to buy hybrid seeds each crop season, a commercially viable hybrid seed industry performing R&D, seed production, and distribution can emerge. This is the case for hybrid corn, vegetables and other cross-pollinated crops, where the yield advantage of hybrids can pay for the full cost of the hybrid seed enterprise.¹⁰ In other words, hybrid seeds are private and not public goods

The hybrid rice program, presumably, subsidizes half of the cost of seeds, as farmers are supposed to pay for the other half after the harvest. Not surprisingly, repayment rates were minimal. Moreover, 70 to 80 percent of farmers drop-out of the program after trying out the seeds for one or two seasons, because of the low yield advantage, higher cost of labor input, and greater susceptibility to disease infestation particularly in the wet season. In practice, the subsidy has been much higher. The government shoulders all of the distribution costs and often pay for poor quality seeds delivered by seed growers that could not be planted by farmers. Since no accounting of the amount collected from farmers has ever been made public, we can assume that only a small fraction of the seed cost has been paid by farmers. In fact, hybrid seeds purchased

by the government using Congressional pork barrel and other special funds, such as the allocations from the Swiss forfeited funds for land reform beneficiaries, were simply distributed free to farmers.

Despite these seed subsidies, independent estimates of hybrid rice adoption rate by the Bureau of Agricultural Statistics have been only in the order of 5 to 6 percent of rice areas from 2005 to 2008, ten years after its first introduction in 1998.¹¹ Hardly any of these hybrid rice crops have paid for any or even a significant portion of the cost of the hybrid seeds. By contrast, the new high yielding inbred rice varieties introduced in the mid-1960s spread to 50 percent of rice areas within five years, and ten years after its introduction around 80 percent of rice areas were already planted to these so- called modern varieties. Evidently, currently existing hybrid rice seeds are not commercially viable, and even if given free, less than 10 percent choose to grow them.

Different types of fertilizers and agricultural chemicals were also distributed free to farmers funded mostly by the Congressional pork barrel, congressional insertions in the DA locally funded projects, and other special funds transferred to LGUs through the DA. Their distribution are often linked to distribution of hybrid seeds, which to the extent that they have value effectively raises incentives for hybrid rice adoption.

Whereas the budgetary allocations for fertilizer subsidies in the early years were spent for fertilizers useful to farmers, David's (2006) field observations indicate that for the most part, the type of fertilizers and chemicals being distributed cannot be justified on scientific and economic grounds. Instead of urea or ammonium phosphate, foliar fertilizers were being given which is more suited to broad leaf plants such as fruits and vegetables but not for rice with a low leaf area index so that most of the applied nutrients drop to the ground. The use of soil conditioners to increase the soil's water holding capacity is unnecessary for irrigated and favorable rainfed areas where rice is grown under flooded conditions. Recent Philrice field studies on the efficacy of use of bio-N, which is currently being distributed, have also not been favorable.

The free distribution of agricultural chemicals is contrary to the principles of integrated pest management approach being promoted which minimizes the use of chemicals. Ironically, the hybrid rice program promotes varieties that are susceptible to bacterial leaf blight, and distributes free pesticide to address this problem. This is despite scientific studies that bacterial leaf blight cannot be effectively and economically controlled by pesticide use.

Clearly, farmers, especially the small farmers, have not been the major beneficiaries of the public expenditures for all types of production support since the late 1990s. The COA has repeatedly documented the overpricing of fertilizers distributed (as much as 600 to 1000 percent), ghost purchases of agricultural inputs, poor quality of farm to market roads, and other questionable government transactions. The Senate's investigation of the fertilizer fund scam confirmed these findings and recommended the prosecution of the government officials involved in the anomalous distribution of fertilizers (Senate, 2009). At least four actual or potential whistleblowers of these anomalies have been killed. Yet within the government, there has been no serious and sustained efforts to address these problems. Indeed, top administrators of agricultural programs do not seem to be genuinely interested in asking whether and to what extent these expenditures have benefitted farmers and the society as a whole, so that the design of agricultural expenditure programs can be improved.

Budgetary appropriations for the agricultural sector have become a convenient vehicle for allocating (or hiding) pork barrel funds. Consequently, major agricultural programs appear to have been designed not so much for the government to address market failures; but to maximize the rents that can be obtained by decision-makers in the legislative and the national and local executive branches of the government, as well as the political favors that these can buy. The increasing share of public expenditures for "all production support" has crowded out the growth in public expenditures for RDER that is necessary in pursuing a modern and globally competitive agricultural sector.

	Research intensity ratio				RDER intensity ratio	
	David et al		ASTI	WB AgPER	MEAP	
	(a)	(b)			National	Nat'l+LGU
1986	_	-	1.39	-	1.58	-
1987	-	-	-	-	1.02	-
1988	-	-	-	-	0.97	-
1989	-	-	-	-	1.10	-
1990	-	-	-	-	1.02	-
1991	-	-	0.62	-	1.12	-
1992	0.28	0.36	0.57	-	0.81	0.92
1993	0.28	0.37	0.69	-	0.72	1.18
1994	0.3	0.39	0.61	-	0.79	1.38
1995	0.33	0.42	0.56	-	0.92	1.57
1996	0.35	0.42	0.54	-	1.10	1.72
1997	-	-	0.61	-	1.05	1.75
1998	-	-	0.61	-	1.22	2.09
1999	-	-	0.49	-	1.03	1.77
2000	-	-	0.48	0.62	1.27	2.04
2001	-	-	0.45	0.37	1.01	1.73
2002	-	-	0.46	0.29	0.82	1.33
2003	-	-	-	0.32	0.68	1.32
2004	-	-	-	0.33	0.60	1.21
2005	-	-	-	0.33	0.56	1.14
2006	-	-	-	_	0.55	1.09
2007	-	-	-	_	0.63	1.13
2008	-	-	-	-	0.74	1.22

Table A5. 1: Alternative estimates of R&D and RDER intensity ratios (percent)

Sources: David et al (1998); Stads et al (2007); World Bank (2007)



Figure A5. 1: Public expenditure for RDER, national government and ALGUs, 1960-2008







P Bn in 1985 prices





Figure A5. 4: Production support as a ratio to agriculture GVA, 1960 - 2008

Endnotes

⁴ Some double-counting of irrigation expenditures may exist between the irrigation portion of the foreign-funded projects and public expanditures for irrigation which include all budgetary transfers from projects being administered by other agencies outside the NIA, such as the DAR. However, budgetary allocations from the ARF that are specifically identified as irrigation and transferred to NIA are not double-counted

⁵ Adjustment entry reflecting the difference between sum of expenditures for the various policy instruments and the estimated total public expenditures based on data on obligated funds.

⁶ This section was based in part in the project's special paper on rural credit by Geron and Casuga (2010).

⁷ Among the incentives granted to rural banks then were the government 50 percent equity contribution, access to preferential rediscount rates at the Central Bank, income tax exemptions, and free technical assistance.

⁸ DCPs are credit projects, activities and programs targeted at a specific sector of the population and implemented by a governmet or quasi-government non-financial agency.

⁹ The Agricultural Competitive Enhancement Fund (ACEF) comes from the tariff revenues generated from commodity imports under the minimum access volume commitment and are earmarked for projects to enhance the global competitiveness of agricultural products.

¹⁰ For corn, the yield advantage is about 100 percent compared to on 25 to 30 percent for rice.

¹¹ Based on the amount of hybrid seeds distributed, the adoption rate has been reported to be around 10 percent.

¹ The unusually high level of expenditure for 1976 was caused by the inclusion of proceeds from the coconut levy in the obligated funds of the Philippine Coconut Authority, which were then invested in private entities. This portion of the RDER is not considered in the analysis.

³ In the ASTI study, about 36 percent of R&D expenditures were accounted for by SCUs. Estimates of SCU expenditures for R&D in David et al and in MEAP are generally lower, because the coverage of SCUs was limited to the top 12 SCUs with agricultural programs and only direct appropriations for R&D were included. The ASTI study included R&D related expenditures of teaching units of SCUs.

THE IMPACT OF AGRICULTURAL SUPPORT POLICY IN THE PHILIPPINES: A REVIEW OF EQUILIBRUM MODELS

Roehlano M. Briones

Senior Research Fellow, Philippine Institute for Development Studies

1. INTRODUCTION

A project on the measurement of agricultural policy support is currently underway (*Monitoring and Evaluation of Agricultural Policies Capacity Development Project* or MEAP-CDP). This project extends earlier work on agricultural market price support (David, Intal, and Balisacan, 2007) and applies the OECD methodology for measuring agricultural support to the case of the Philippines. This approach seeks to determine the monetary value of transfers to agriculture through various policy instruments (OECD, 2004). It is well known however that the effect of such support policies goes beyond the actual value of the transfer. The implicit subsidy (penalty) to supply encourages (discourages) supply; changes in supply would furthermore affect the economic system as a whole through market interactions. In short, a more complete evaluation of the impact of agricultural support would need to examine allocative effects within the context of supply, demand, and markets.¹

This paper reviews the related literature on modeling Philippine agricultural market. It provides a background extending the results and techniques of the MEAP-CDP study towards future work on computing the resource allocation effects of agricultural support in the Philippines. Specifically this study seeks to examine the following:

- The existing structure and predictive capacity of the models currently used in the quantitative analysis of the impact of Philippines agricultural policies on outputs, inputs use, consumption, etc;
- ii) The necessary adaptations or innovations that would be required in order to link the support estimates to the analysis of impacts of policies and programs through the use of partial and/or general equilibrium models.

The rest of this paper is organized as follows: As essential background, the paper discusses the conceptual framework and review of the OECD method, as well as equilibrium approaches to modeling allocative impact (Section 2). Objective i) is

addressed in the review of models (Section 3); objective ii) is tackled next (Section 4). Section 5 concludes.

2. CONCEPTUAL FRAMEWORK

Review of OECD method

The OECD manual for agricultural support measurement states the following principles (p. 24):

- Transfers to agricultural producers is the key criterion for inclusion of policy in the measurement of support;
- ii) No consideration of the nature, objectives or economic impacts of support;
- iii) General policy measures available throughout the economy are not considered;
- iv) Transfers are measured in gross terms;
- v) Policy transfers to individual producers are measured at the farm gate level;
- vi) Policy transfers are distinguished by implementation criteria, i.e. basis on which support is provided

From principle ii, agricultural support excludes analysis of policy impacts. Principle iv limits the scope to gross payments (without netting out the costs incurred by the producer in undertaking the activity being supported). Principle vi implies disaggregation of support by indicator of type or level of activity, i.e. commodity, area, input use, etc.

The OECD method distinguishes several types of agricultural support estimates, based on whether transfers are to farmers, consumers, or to agriculture in general, respectively: *producer support estimates* (PSE); *consumer support estimates* (CSE); and *general services support estimates* (GSSE).

Producer support is the most detailed and contains the following:

- Market price support support policies that raise the market price of agricultural output, relative to the no-support counterfactual. In practice the latter is proxied by the border price, i.e. the c.i.f. import price for importables, or the f.o.b. export price for exportables.
- ii) Payments based on output.
- iii) Payments based on area planted/animal numbers.

- iv) Payments based on historical entitlements (e.g. historical plantings)
- v) Payments based on input use
- vi) Other payments (input constraints, overall farming income, miscellaneous payments)

For the Philippines the policies pursued are net support for market price, and net subsidies on input use. Payments based on crop output, planting indicators (area and number), livestock inventory, and so on are nil to insignificant.

The other major component is GSSE, which offers collective support for agriculture and is not commodity-specific. The major components are:

- i) Research and Development
- ii) Agricultural Schools
- iii) Inspection services
- iv) Infrastructure
- v) Marketing and promotion
- vi) Public stockholding
- vii) Miscellaneous

In the Philippines, it is plausible that some of the GSSE items may be specified by commodity; for instance, publicly-funded irrigation is confined to rice-producing farms; as well, some of the R&D investment may be commodity-specific, with little spillover benefit to other crops.

Equilibrium models and impact analysis

We limit our review of models to those that are based on an *equilibrium* in supply and demand. Quantities of supply and demand for each given market are represented by functions of price and other variables; equilibrium is represented by the constellation of price and other endogenous variables that equalize the quantity supplied in each market. We include in this review only those models that have been specified numerically, i.e. the functions are assigned numerical parameters and baseline data, which is replicated as a baseline equilibrium.

These models are based on *static* equilibrium, i.e. conditions of demand and supply balance within a single time period. *Dynamic* equilibrium models allow supply and demand to be determined over multiple periods; applications of these in for Philippine are sparse or non-existent. Static models can be distinguished according to the scope of

equilibrium being computed. *General equilibrium* models attempt to simulate the operations of the entire real economy, i.e. the complete set of goods and factor markets (suitably disaggregated). *Partial equilibrium* models attempt to simulate only a subset of the real economy (often omitting factor markets altogether). These models in turn divide into multi-market and single-market models; in the former, price variables affect supply and demand of different commodities, while for the latter, the supply and demand of a commodity is affected only by its own price.

Allocative impacts of agricultural support

The OECD manual describes a Policy Evaluation Model (PEM), which aims to "bridge the gap between the PSE information, which categorizes and quantifies agricultural support, and the impacts of policies, by providing an analytical instrument to measure the economic effects of support on production, trade, prices, income, and welfare (p. 175)." The PEM is a partial equilibrium model which covers major cereal and oilseed crops, milk, and beef production in six OECD countries/regions. Only PSE estimates are covered in the PEM, and each PSE category is modeled by price wedges for both product and input markets.

In particular, market price support is usually incorporated as an *ad valorem* tariff, except in cases where input and production quotas are taken into account. Meanwhile payments based on variable input use is treated as an input price subsidy, and is not specific to any agricultural commodity, except for fertilizer and hired labor. The price wedge approach offers the most natural method for incorporating market price support into partial or general equilibrium models.

Meanwhile the non-specific nature of GSSE precludes allocative impact analysis; hence no provision for such is made for the PEM. However the two exceptions mentioned above (irrigation and R&D) may offer a leeway for incorporating GSSE in a partial or general equilibrium model. Either R&D or irrigation boost productivity; in general a productivity improvement leads to a rightward shift in the relevant supply curve. Once the magnitude of the shift is known, it is a fairly straightforward exercise to calculate the resulting changes in equilibrium prices and quantities. The problem is ascertaining the magnitude of the shift, in relation to the size of the expenditure on the GSSE instrument. This would require a review of the related literature on the *ex post* (or even *ex ante*) impact of R&D and irrigation.

3. REVIEW OF MODELS

Overview

The following review focuses on the structure of the models. Evaluation of the models are usually based on their structure, assumptions, or reliability of baseline data; assessment based on "predictive capacity" is rare. Equilibrium models are well-known to predict point-to-point changes poorly, as their design limits them to movements of an idealized equilibrium, which may be more consistent with an "average" or "long-term" tendency. It turns out that, for the Philippines, equilibrium models are more commonly in the general equilibrium mode, hence these are examined first, followed by multi-market models. Note that single-market models are exceedingly simple and fail to incorporate inter-sectoral effects, hence are excluded in this review.

Computable general equilibrium models²

Ramon Clarete, Cielito Habito, and Romeo Bautista can be credited as the pioneers of CGE (computable general equilibrium) modeling for the Philippines in the 1980s (Bautista, 1988). In the 1990s the most disaggregated CGE model for the country (50 sectors) was the Agricultural Policy Experiments (APEX) model (Clarete and Warr, 1992). The APEX has 16 agricultural sectors. One important feature of the model is that a large number of elasticities for supply, demand, trade were estimated from data. The APEX has been applied to the trade policy reforms associated with WTO accession (Cororaton, 1997).

The TARFCOM model (Horridge et al 2001) has now replaced the APEX as the most disaggregated CGE model of the Philippines. Based on the ORANI-G of Australia, the model has 229 industries, 28 of which are under agriculture. Simulations run by Cabalu and Rodriguez (2006) finds that agriculture contracts under all scenarios (actual tariff reductions, target tariffs in agriculture, uniform tariffs, and removal of tariffs).

In the 1990s several environmental CGEs were developed, some of which were applied to the assessment of the impact of land degradation in agriculture. Coxhead and Jayasuriya (1994, 1995) specified three goods (manufactures, tree crop, and food) and two regions (lowland, upland). Manufactures are importable, tree crops are exportable, and food is nontradable. Food production in the uplands is erosive. Their simulations showed that trade liberalization in the form of tariff reduction for manufacturing shifts land use in the uplands to tree crop production from food crop production, thus reducing

soil erosion. Subsequent studies using the APEX model led to similar results (e.g. Coxhead and Jayasuriya, 2002).

CGEs of recent vintage (2000 onwards) have focused on agricultural trade policies. One strand extends analysis of WTO-related reforms to household welfare. The envisaged Doha round, which continues the WTO program of trade liberalization in world agriculture, is evaluated in Cororaton, Cockburn, and Corong (2006). While having the expected positive effect on total household incomes, poverty rises slightly, especially among rural households. Similarly, liberalization of international trade in rice is found to increase poverty as a large subset of the poor are palay farmers (Cororaton and Cockburn, 2006).

Another strand applies updated versions of earlier CGE models for agricultural trade policy. Rodriguez and Cabanilla (2006) examine a possible US – Philippine free trade agreement (FTA) and its impact on agriculture; they find that such an agreement would benefit Philippine agriculture. A broader agreement covering Asia and the Pacific (the FTAAP) was also evaluated using the TARFCOM (Rodriguez, 2006). It finds that while an FTAAP would benefit the economy in general, it would have an adverse impact on agriculture.

The major advantage of applying a CGE is its comprehensive approach to economic modeling. However, *for the limited purpose of agricultural sector analysis,* this very comprehensiveness could be a drawback. A CGE modeler may have to rely on extensively on imputation of price (and even income) response to be able to cover all production sectors and factors of production, as well as macro-closure conditions such as the balance of trade. If the majority of economic activity were coursed through agriculture then accounting for these behaviors would make sense. However according to NSDB data, agriculture in 2007 accounts for only 14% of GDP and under 35% of employment. Hence one may trade off the need to make strong assumptions for reduced comprehensiveness, if agriculture-specific policies play a relatively minor role in economy-wide adjustment. This trade-off is implicit in adopting a multi-market partial equilibrium (as opposed to general equilibrium) approach to agriculture sector modeling, as advocated in this study.

Certain techniques popular in the CGE literature may on the other hand can be readily borrowed for partial equilibrium modeling, particularly in the area of trade. A common approach for modeling imports and exports (exemplified in say the TARFCOM) is to distinguish, respectively, domestic demand by source (foreign or local supply) as

well as domestic supply by destination (foreign or local market). The substitution or transformation of demand or supply by source or destination is modeled by a constant elasticity function. For the demand side this is the constant elasticity of substitution first suggested by Armington (1969). For the supply side this is the constant elasticity of transformation (Powell and Gruen, 1968). This is more general than the alternative of treating domestic and foreign sources/supplies as perfect substitutes, effectively confronting domestic producers and consumers with world prices subject to some constant margin attributed to trade barriers.

Partial equilibrium models

In terms of relevance to Philippine agriculture, agricultural multi-market models are either international (or even global) in scope with a country-level disaggregation explicitly incorporating the Philippines, or else have been specifically built to represent Philippine agriculture with the rest of the world as a foreign sector.

International agricultural models

Recent overviews of international agricultural models are by Wailes (2005) and Croppenstedt et al (2007). The Philippines appears in many of them, such as in the FAO World Food Model (FAO, 2003) and the Aglink-Cosimo model (OECD-FAO, 2007). This is understandable as the country is a major world agricultural exporter (e.g. coconut, banana, pineapple, and mango) as well as importer (e.g. rice).

Also widely used for long term projections of global agriculture and food security is the IFPRI's International Model for Agricultural Commodities and Trade or IMPACT (Rosegrant et al, 2005). Market equilibrium in IMPACT is at international market clearing, i.e. the sum of net trade across countries by commodity is zero; domestic producer prices equal world prices with adjustment term for marketing margin and producer subsidy equivalent

On the demand side, total demand is the sum of food, feed, and other uses. Per capita food demand is a constant elasticity function of own-price, cross-prices, income. Feed demand is a constant elasticity function of own-price, other feed prices, and quantity supplied of feed using commodity (adjusted by feed ratio). Finally, other uses is assumed to change at similar rate as rate of change of food and feed demand.

On the supply side, IMPACT adopts the widely-used area x yield formulation for modeling crop supply based on constant elasticity. That is, letting *AC* represent crop

area, *YC* the yield, *PS* the producer price, *PF* the factor price, *gA* the exogenous growth of agricultural area, *gCY* the exogenous growth of yield, α , β as constant parameters, ε , γ as the elasticities, and *t*, *i*, *n* index respectively the time period, commodity, and country, then the IMPACT has:

$$AC_{tni} = \alpha_{tni} \times (PS_{tni})^{\varepsilon_{tin}} \times \prod_{j \neq i} (PS_{tnj})^{\varepsilon_{ijn}} \times (1 + gA_{tni})$$
(1)

$$YC_{tni} = \beta_{tni} \times (PS_{tni})^{\gamma_{tin}} \times \prod_{j \neq i} (PF_{tnj})^{\gamma_{jn}} \times (1 + gYC_{tni})$$
(2)

The exogenous yield trend incorporates the supply shifters, primarily those relates to productivity growth, brought about by the following policy levers, among others:

- Research
- Agricultural extension and farmers schooling
- Infrastructure
- Irrigation

Meanwhile demand is the sum of demand for food, feed, other uses. Demand for food per capita is a constant elasticity function of own-price, cross-prices, income; this is then multiplied by an exogenous population estimate to arrive at market food demand. Meanwhile, feed demand is also modeled as a constant elasticity function of own-price, other feed prices, and a linear function of quantity supplied of the feed-using commodity (where the coefficient is derived from the feed conversion ratio). Lastly, demand from other uses is assumed to change over time at a similar rate as rate of change of food and feed demand.

As a multi-country model, the IMPACT assumes international market clearing, i.e. the sum of net trades over countries (by commodity) should be zero at equilibrium. A crucial feature is that domestic producer prices equal world commodity prices, except for an adjustment term incorporating the marketing margin and net producer subsidy (or its equivalent, in the case of quantitative restrictions). This is a fairly standard approach, but one which implicitly imposes perfect substitutability between domestic and foreign demands and supplies. Less restrictive formulations are allowed by way of the Armington formulation (Armington, 1969) or the Constant Elasticity of Transformation (Powell and Gruen, 1968), which are more commonly adopted in CGE models.

Multi-market models of Philippine agriculture

The literature on multi-market models for Philippine agriculture is sparse. Rosegrant-Rozelle (1993), cited and applied in Balisacan and David (1995), was an earlier attempt to model Philippine agriculture. This model resembles a nascent form of the IMPACT model. The one Philippine agricultural model that remains in active use is the Agricultural Policy Simulation Model or APSIM, extensively documented in APPC (2003). Figure 1 displays a schematic of APSIM. It has affinities with the IMPACT: consumption and production follow the constant elasticity framework, while the latter is determined by area and yield response functions. The latter are affected by "policy interventions, and other environmental variables such as input price policy, research and development [R&D] expenditures, irrigation investments, agricultural extension, and other policy variables (p. 7)."



Figure 1: Schematic of the APSIM model

As with IMPACT, demand components are: consumption, livestock use, and other uses (i.e. processing and seeds). In contrast to IMPACT, there is provision for a limited pass-through from world to domestic prices via Armington coefficients. However in applied work, domestic and foreign products are perfect substitutes, hence for tradable goods, domestic prices are equal to world prices plus an adjustment factor for tariffs, and quantitative restrictions. Additional useful features of APSIM are: i) its capability for stochastic Monte Carlo simulation, i.e. fluctuations of the world price according to some predetermined distribution function; ii) its capability to derive income and welfare changes, by recursively passing on its market equilibrium effects to a household submodel.

4. REQUIRED ADAPTATIONS

MPS: perfect substitutability between domestic good and importable

For agricultural output, only importables are the objective of domestic support (export taxes have been abolished since 1986 and no serious subsidy program is in place).³ For an importable, in the simple case depicted in Figure 2, which depicts the usual supply and demand curves (*S* and *D*, respectively), where market intermediation is non-existent; producer price (along S) is equal to the consumer price. The border price is also the consumer price in the absence of market support; however the market support drives a wedge between the border and consumer price, here modeled in *ad valorem* terms (i.e. *mps*). Note that the small open economy assumption is imposed (i.e. a perfectly elastic global supply at the border price). Imports are represented by





In reality though there is market intermediation, such that the producer price is not equal to the consumer price due to a marketing margin; in fact there may be several stages in the marketing chain, whether from domestic producer to consumer, or from foreign producer to consumer. Suppose the wholesale domestic price and the border price (c.i.f.) approximately corresponds to the same stages in either marketing chain. However this still needs to be translated into market price support *at the level of the producer price*. To fix ideas, let P_{WH} be the wholesale price, assumed to be the last stage in the chain, and *m* be the marketing margin from producer to wholesaler. Then we have:

$$P_{WH} = P_F \cdot (1+m)$$

At equilibrium, the wholesale price should be the supported border price, where market support is computed based on the last price in the chain:

$$P_{WH} = P_B \cdot (1 + mps_{WH})$$

We therefore have:

$$mps_{WH} = \frac{P_F \cdot (1+m)}{P_B} - 1 \tag{3}$$

However producer support is more accurately estimated by mps_F , as follows:

$$mps_F = \frac{P_F}{P_R} - 1.$$
(4)

The use of (3) to calculate the left-hand side of (4) incorporates an *overestimate* due to the marketing margin. Note however from the modeling standpoint, the error, so long as it is constant, is of little consequence in calculating the comparative statics of altering the mps.⁴

MPS: imperfect substitutability between domestic good and importable

This case is applicable for models that incorporate an Armington framework for modeling import and domestic demand; this includes many CGE models, and newer type of multi-market models, e.g. the fish sector model of Dey, Briones, and Ahmed (2005). Let quantity demanded QD be a constant elasticity of substitution (CES) function of imports QM and domestically produced output QH. Algebraically:

QD = CES(QM, QH)

Again assuming away a marketing margin, the price paid on the demand side is P, the price paid for imports or import price is P_M . We therefore have:

$$P_F \cdot QH + P_M \cdot QM = P \cdot QD$$

The market price support enters in the calculation of the import price from the border price:

 $P_M = P_B \cdot (1 + mps)$

Under this method, the measurement of market price support should be more explicit in estimating tariffs and tariff equivalents of non-tariff barriers, while netting out subsidies. The direct nominal measure (from comparison of domestic and border price) would give a potentially misleading estimate under this approach. Note however that such direct measures are typically applied when estimating wedges between world (border) and import prices in standard CGE models.

Finally we consider input price support. Typically input supply is from outside agriculture, hence we are not interested in modeling treatment of domestic versus foreign production. In the case of an importable input (say fertilizer), policies may drive a wedge between the domestic and border price; these usually represent a net effect of both subsidies and perhaps tariffs or other import restrictions. Denoting the domestic input price as w_p , the border price as w_p , and the net subsidy as *s*, we have:

$$w_D = w_B * (1-s)$$

Hence s > 0 represents a net subsidy, i.e. producers are able to pay a domestic price lower than the counterfactual border price. In the case of a nontradable, what we wish to compare is the market price, and the price prevailing in the absence of the policy, i.e. the undistorted (domestic) equilibrium price. In the case of say labor, the distortion may take the form of a minimum legislated wage; the support would then be negative, and can be measured as the proportional difference between the binding minimum wage, and the shadow wage, however estimated.

GSSE support

Under GSSE, application of crop-specific supply shift is more appropriate for irrigation and R&D (with perhaps extension). For irrigation, suppose irrigated rice is a separate commodity (at least on the supply side), and crop supply is modeled as in terms of the area-yield formulation (as in IMPACT and APSIM). Then one simply needs to translate how the irrigation investments translate into service area coverage at the margin. On the other hand, if quantity supplied is directly related to price, then an exogenous upward shift would have to be computed based say on the yield effect of irrigation investment at the margin. Under constant returns to scale, let *a* represent

average cost, *y* represent yield per ha, and *c* represent cost per ha, and [^] represent percentage change. Then the change in marginal cost = change in average cost can be calibrated as follows:

$$\hat{a} = \hat{y} - \hat{c} \,. \tag{5}$$

From the change in marginal cost, the corresponding supply shift is straightforward. Lastly, in case irrigated rice supply is aggregated within overall rice supply, then the foregoing calculation should be pro-rated according to the share of irrigated rice output in the total.

Meanwhile for R&D, calculation proceeds by translating first the change in R&D investment into the change in average/marginal cost (under constant returns to scale). It may be easier to compute the *ceteris paribus* yield impact of an R&D investment at the margin, hence equation (5) may be exploited. Such yield impact can be generated from *ex post* case studies, econometric methods, or expert judgment. This opens a whole highly involved literature on research evaluation; Alston, Norton, and Pardey (1995) provide a useful introduction to the related issues and techniques.

5. CONCLUDING REMARKS

From our review it is clear that there is no dearth of market equilibrium models for Philippine agriculture that can be used to analyze the allocative effects of agricultural support policies. These models are heavily concentrated on the general equilibrium category; modeling within the simpler and more tractable multi-market equilibrium mould is far less active. However enough precedents exist to provide sufficient guidelines for future modeling work.

Also based on our review, application of OECD-type producer support estimates to these models is fairly straightforward. For MPS, models based on perfect substitution of domestic and foreign versions of a commodity are the simplest to apply, as these involve translation of the support estimates into equivalent *ad valorem* subsidy. Some more involved calculations may be warranted for more flexible forms allowing imperfect substitution. For GSSE however additional work is needed to translate expenditure or investment items into supply shifts. This is clearly the way forward for further research.

It is appropriate now to mention that precisely these tasks are underway in the agriculture research program of the PIDS. A multi-market equilibrium model is now under construction, based on earlier models, and imposing imperfect substitution, with perfect substitution as a special case. The modeling study is part of a larger initiative of

measuring the impact of productivity growth based on policy instruments such as infrastructure (including irrigation) as well as R&D. With these parallel research efforts, we may expect an expedited study of the allocative impacts of the agricultural policy indicators now being measured within the MEAP-CDP.

ENDNOTES

³ Recall that MPS is purely in nominal terms, unlike the effective protection rate, which *would* be expected to register negative levels for exportables.

⁴ The exception of course holds when the marketing margin is not constant. If so this needs to be explicitly incorporated in the model. Estimates of the "transmission elasticity", i.e. the change in equilibrium farmgate price, due to changes in the wholesale price, may help calibrate the behavior of the margin. Similarly, while we have assumed away the wholesale-to-retail stage, the analysis in the text would remain largely intact so long as the marketing margin in that stage is constant. For most equilibrium models, this is typically the case.

REFERENCES

Alston, J., M. Norton, and P. Pardey, 1995. *Science Under Scarcity: Principles and Practice for Agricultural Research Evaluation and Priority Setting.* Ithaca: Cornell University Press.

Armington, P., 1969. A theory of demand for products distinguished by place of production. *IMF Staff Papers* 16(1):159-76.

Asia Pacific Policy Center, 2003.

Bautista, R., 1988. Macroeconomic models for East Asian developing countries. Asian-Pacific Economic Literature 2(2):1-25.

Bautista, R., and S. Robinson, 1997. "Income and equity effects of crop productivity growth under alternative foreign trade regimes: a CGE analysis for the Philippines." Asian Journal of Agricultural Economics 2(2):177-194.

Cabalu, H., and U-P. Rodriguez, 2006. When policymakers don't get it right: evidence form the Philippine 2005 Tariff Reform. Paper presented at the 35th Australian Conference of Economists, Curtin University of Technology, Perth, Australia, 25-27 September.

Clarete, R. and P. Warr, 1992. The theoretical structure of the APEX model of the Philippine economy. Philippine Department of Agriculture and Philippine Economic Society, Workshop on the APEX CGE Model of the Philippine Economy.

¹ Other impacts are on *equity*, i.e. incidence of transfer and allocative effects on the poorer households, and on the public sector's *fiscal position* and therefore financial and macroeconomic effects. These dimensions of impact are beyond the scope of this paper.

² For the literature up to 2002, this section draws heavily from Yap (2003).

Cororaton, C., 1996. Simulating the income distribution effects of the 1988-1992 tariff reduction using the APEX model. PIDS Discussion Paper Series No. 1996-01. Makati City, Philippines: Philippine Institute for Development Studies.

Cororaton, C., 1997. Simulating the effects of GATT-UR/WTO on the Philippine economy. *Journal of Philippine Development* 24 (44):191-222.

Cororaton, C. and J. Cuenca, 2000. An analysis of Philippine trade reforms in 1995-2000 using the 1994 APEX model. PIDS Discussion Paper Series No. 2000-36. Makati City, Philippines: Philippine Institute for Development Studies.

Cororaton, C., J. Cockburn, and E. Corong, 2006. Doha scenarios, trade reforms, and poverty in the Philippines: a CGE analysis. In: *Poverty and the WTO: Impacts of the Doha Development Agenda*. T. Hertel and A. Winters, eds. World Bank, Washington, D.C.

Cororaton, C., and J. Cockburn, 2006. WTO, trade liberalization and rural poverty in the Philippines: is rice special? *Review of Agricultural Economics* 28(3):370-377.

Coxhead, I., 2000. The consequences of Philippine food self-sufficiency policies for economic welfare and agricultural land degradation. *World Development* 28 (1):111-128.

Coxhead, I.and S. Jayasuriya, 1994. Technical change in agriculture and land degradation in developing countries: a general equilibrium analysis. *Land Economics* 70(1):20-37.

Coxhead, I., 1995. Trade and tax policy reform and the environment: the economics of soil Erosion in developing countries. *American Journal of Agricultural Economics* 77(3):631-644.

Coxhead, I., and S. Jayasuriya, 2002. Economic growth, development policy and the environment in the Philippines. *The Philippine Economy: Development, Policies, and Challenges*. H. Hill and A. Balisacan, eds. New York: Oxford University Press.

Coxhead, I. and G.E. Shively, 1998. Some economic and environmental implications of technical progress in Philippine corn agriculture: an economy-wide perspective. *Journal of Agricultural Economics and Development* 26(1/2):60-90.

Coxhead, I., G.E. Shively and X. Shuai, 2002. Development policies, resource constraints, and agricultural expansion on the Philippine land frontier. *Environment and Development Economics* 7:341-363.

Coxhead, I. and P.G. Warr, 1991. Technical change, land quality and income distribution: a general equilibrium analysis. *American Journal of Agricultural Economics* 73 (2):345-360.

Coxhead, I., 1995. Does technical progress in agriculture alleviate poverty? A Philippine case study. *Australian Journal of Agricultural Economics* 39(1):25-54.

Croppenstedt, A., L. Bellu, F. Bresciani, and S. DiGuiseppe, 2007. Agricultural policy impact analysis with multi-market models: a primer. ESA Working Paper No. 07-26. Rome: Food and Agriculture Organization.

David, C., P. Intal, and A. Balisacan. 2007. Distortions to Agricultural Incentives in the Philippines. Agricultural Distortions Working Paper 28. World Bank: Washington, D.C.

David, C., and A. Balisacan, 1995. Philippine rice supply demand prospects and policy implications. *Journal of Philippine Development* 22(2):233-263.
Dey, M., R. Briones, and M. Ahmed, 2005. Disaggregated analysis of fish supply, demand, and trade in Asia: baseline model and estimation strategy." *Aquaculture Economics and Management* 9(1/2):113-139.

Food and Agriculture Organization [FAO], 2003. World Agriculture: Towards 2015/2030: An FAO Perspective. J. Brinsma, ed. Rome: FAO.

Habito, C. 1986. A computable general equilibrium model for Philippine agricultural policy analysis. *Journal of Philippine Development* 18(23): 208-225.

Horridge, M., J. Giesecke, H. Cabalu, M. Mendoza, and U. Rodriguez. 2001. TARFCOM: a CGE model of the Philippines. Institute for Research into International Competitiveness, Curtin Business School, Curtin University of Technology, Perth, Australia.

Inocencio, A.B., C.M. Dufornaud and U.E. Rodriguez. 2001. Impact of tax changes on environmental emissions: an applied general equilibrium approach for the Philippines. IMAPE Research Paper No. 07.

Organization for Economic Cooperation and Development [OECD]. 2008. OECD's Producer support estimate and related indicators of agricultural support: concepts, calculations, interpretation, and use (the PSE manual). Trade and Agriculture Directorate, OECD.

OECD-FAO (2007). Agricultural Outlook 2007 - 2016. Paris: OECD/FAO.

Powell, A., and F. Gruen, 1968. The constant elasticity of transformation production frontier and linear supply system. *International Economic Review* 9:315-328.

Rodriguez, U-P., and L. Cabanilla, 2006. The impact of a Philippine-US FTA: the case of Philippine agriculture. Discussion Paper No. 2006-06. Makati: Philippine Institute for Development Studies.

Rodriguez, U-P., 2008. Impacts of the Free Trade Area of the Pacific (FTAAP) on production, consumption, and trade of the Philippines. Discussion Paper No. 2008-20. Makati: Philippine Institute for Development Studies.

Rosegrant, M., C. Ringler, S. Msangi, T. Sulser, T. Zhu, and S. Cline, 2008. International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT): Model Description. Washington, D.C.: International Food Policy Research Institute.

Wailes, E., 2005. Review of existing global rice market models. In: Toriyama, K., and B. Hardy, eds. *Rice is Life: Scientific Perspectives for the 21st Century.* Proceedings of the World Rice Research Conference, Tokyo and Tsukuba, Japan, 4-7 November. Los Baños, Philippines, and Tsukuba, Japan: Japan International Research Center for Agricultural Sciences, 502 – 504.

INTRODUCTORY NOTE FROM THE PHILIPPINE INSTITUTE OF DEVELOPMENT STUDIES

The views stated in this paper are the expert opinion of the consultant and not that of the Philippine Institute of Development Studies (PIDS).

The PIDS adheres to a research agenda approved by its Board of Trustees. Monitoring and evaluation of agricultural policy indicators is consistent with its agenda. However, assuming it as a permanent function may entail a sustained dedication of resources that may constrain its flexibility to address other, equally important research areas.

The Institute is willing and able to undertake further studies and capacity building along lines of the MEAP – CDP, as an on-going project supported by external funding, preferably based on a dedicated resource commitment from the Government of the Philippines.

The Institute has conducted consultations with DBM, NEDA, and DA regarding institutionalization of MEAP – CDP. The outcome of the exercise is seen to be valuable and useful. However, the MEAP methodology is a technical exercise, more suitable for a specialized research organization. A realistic suggestion may be to revisit the agricultural policy indicators every five years. The agencies consulted are amenable to update the estimates over the period 2007 - 2012, although it is not clear where funding of such an update may be sourced.

Thoughts on the Institutionalization of the MEAP

Ponciano Intal, Jr.

Rationale

The health of the agriculture sector is critical for the sound and robust growth of the Philippine economy and for the sustained and substantial reduction of poverty in the country. Most of the country's poor are in the rural areas and food cost has a preponderant share of the total expenditures of the low income families in the country. At the same time, the country has significant potentials for agricultural growth and diversification in the light of the growing demand for high value agricultural and processed foods products and for biofuels in Asia where the country is geographically well positioned.

The health of the agricultural sector is determined in part by the overall policy biases of the government between agriculture and non-agriculture and, equally important, among the subsectors and industries **within** the agriculture sector (e.g., rice, corn, sugar, coconut, fruits, vegetables, piggery, poultry, etc.). The policy measures that affect the policy bias of the government between agriculture and non-agriculture and among the agriculture sub-sectors and industries include border policy measures like tariff and non-tariff measures, government domestic taxation and expenditure programs, sector – specific policies like agricultural research and development and irrigation, and macroeconomic policies that affect key macroeconomic variables like the exchange rate, interest rate, and inflation rate.

Because the agriculture sector is affected by a plethora of policies and programs of the government, measures have been developed by OECD, World Bank and other institutions that provide summary information on the impact of government policies, programs and other interventions on the agricultural sector as a whole and on the various component

287

subsectors and industries of the agriculture sector. These various measures include such variously- named measures as Market Price Support (MPS), Nominal Rate of Assistance (NRA), etc. Monitoring these measures over time provides a reasonably good indication on the impact of the various policies and programs of the government on the agriculture sector.

Institutionalization of the Monitoring System

Virtually all stakeholders involved in the agricultural sector have a stake on a successful implementation and sustainable operation of the Agricultural Policy Monitoring System (MEAP). The government –with its various instrumentalities in the executive branch—will find MEAP useful because it can give indication of the effectiveness and efficacy of the various government policies and programs as they bear on the agricultural sector. The various stakeholders in the non-government sector, as well as the donor community, will find MEAP useful in pushing the government for greater transparency, effectiveness, and cost efficiency of government interventions as well as for institutional reforms of concerned government instrumentalities or agencies. In short, MEAP can provide a –eommon ground," –eommon measure" or –eommon language" on which the government and the other various stakeholders can engage themselves in an intelligent –eonversation" to improve and refine government policies and programs and even strategies toward the sustained and robust growth and development of the country's agricultural sector.

Among all the stakeholders involved in the agricultural sector, it is the government that has the largest stake. This is because it is government policies, programs and strategies, rather than the action of the other stakeholders, which preponderantly shape the agricultural sector. As such, MEAP becomes a management tool for the government, in order for the government to determine the impact of its policies on the sector. At the same time however, MEAP needs to be credible and accessible to the other stakeholders in the sector who would need the data, indicators and analyses in the MEAP for their engagement with the government. Credibility demands not only technical competence but

also some measure of independence from government implementing agencies. Finally, the other stakeholders need to have a sense of ownership of MEAP as much as the government does.

Thus, MEAP needs to have at least the following characteristics in its institutionalization: TRANSPARENCY, CREDIBILITY, and ACCESSIBILITY

Proposed Institutional Structure

The following are the proposed steps for the institutionalization of MEAP:

 Host institution. The ideal host institution is the one that has a culture of independence, transparency, and accessibility. Within the Philippine government, only the Philippine Institute of Development Studies shares such culture apart from government owned colleges and universities which by their very nature needs to have such culture. State colleges and universities, however, are well removed from the policy process in the executive and legislative branches. In contrast, PIDS is well embedded in it because of its attachment to the National Economic and Development Authority. Moreover, PIDS has good links with key committees in Congress.

Thus, PIDS is the best institution to lodge the MEAP simply because PIDS services all government executive departments and the Legislature. PIDS also services the general public; i.e., civil society, academe, media, business sector, etc.. PIDS has the analytic capability for MEAP. The culture at PIDS emphasizes independence, transparency and accessibility; hence, it is likely to be the most credible institution in the government to maintain MEAP.

There are three other probable candidates as host of MEAP; namely, DBM, NEDA-Agriculture Staff and the Department of Agriculture. DA is the

government agency that in principle has the most use of the MEAP indicators because they can be used as management tools in as much as the data and indicators would provide good information that is useful for allocation of resources and policy intervention **within** the agriculture sector, a critical management function of the Department of Agriculture. However, DA offices do not have two of the important criteria for a credible MEAP; namely, independence and transparency. Even the Bureau of Agriculture Statistics could be hampered by political pressures from the Secretary of the Department of Agriculture, which has been highly politicized in recent decades (i.e., politically ambitious individuals covet it as a stepping to senatorial positions or as a possible source of electioneering resources).

DBM and NEDA-Agriculture Staff have oversight roles and economy-wide perspectives, which are both useful for MEAP that must naturally look at agriculture both within the sector and between agriculture sector and the rest of the economy. DBM needs MEAP in its budget allocation and monitoring functions. NEDA can use MEAP for its planning and policy analysis functions. Thus, in principle, both DBM and NEDA-Agriculture could be better candidates to host MEAP than the DA. However, both DBM and NEDA-Agriculture Staff are hampered by the sheer inadequacy of staff given the voluminous work the staffs are already burdened with. Transparency and accessibility, especially to civil society, are also not quite ingrained as part of the corporate cultures of the two organizations. Hence, it is likely that the quality, credibility and usefulness of MEAP will be highly compromised if it is lodged in either the DBM or the NEDA.

2. *Ensuring Data Compliance and Continuity*. While PIDS has the corporate culture that is ideal for a host of MEAP, PIDS is constrained by the fact that it does not have decision making clout that can impel concerned government agencies to provide the data as accurately and timely as possible. Moreover, there

290

is a danger that PIDS limited resources could be diverted to the maintenance of MEAP and away from more important policy research initiatives that the Institute needs to pursue. In view of the above, it is likely that the PIDS management would be lukewarm to any recommendation to put MEAP in PIDS.

In order to ensure data compliance and continuity of MEAP without overtaxing PIDS, the following are suggested:

- 3. Legislative mandate. It is recommended that the Legislature, through the recommendation of the Senate-Congress Committee on Agricultural Modernization (COCOFAM), will approve Senate and House Resolutions for the creation of a Agricultural Policy Monitoring System (or MEAP), with separate government funding, to be attached to the LEDAC or NEDA-DBCC, but to be lodged at and maintained by PIDS. A Legislative resolution is needed to ensure budgetary support separate from the regular budgets of PIDS or NEDA or LEDAC. The resolution would include the requirement of regular reports to the NEDA Board and Congress. A legislative mandate that explicitly attaches MEAP to LEDAC or NEDA Board and mandating concerned government agencies to provide the needed data and information for MEAP will address the problem of clout, in coordination with the support of the Steering Committee of MEAP (discussed below).
- 4. *Governance*. It is proposed that there is a joint public –private Steering Committee to oversee the operations of the MEAP in PIDS. The Steering Committee will provide the overall guidance to MEAP activities. Equally important, the Steering Committee members could provide the needed linkages for the successful operation of MEAP.

The Steering Committee is proposed to be composed of the following:

- a. NEDA
- b. DA
- c. SEPO
- d. CPBD
- e. DBM
- f. Bureau of Agricultural Statistics
- g. Representative from the civil society or PO or NGO
- h. Representative from the agri-based business sector

Either NEDA or DBM should chair the Steering Committee because they are the two agencies in the government that have arms-length relationship with the Department of Agriculture and yet intensely conscious of the significance of the agriculture sector in the whole economy and its impact on government budget. SEPO and CPBD are suggested here because their staffing is more stable than the concerned House and Senate committees in charge of agriculture. Nonetheless, there is merit in having the concerned House and Senate committees in agriculture because it is the committees that are more directly involved in the policy and lawmaking process. If the impermanency of the representation of the Committees in the Steering Committee is not a critical issue for MEAP, then SEPO and CPBD can be replaced by the representatives from the House and Senate committees on agriculture.

5. Reporting and Dissemination. PIDS and the Steering Committee are required to make a regular (say, annual) report to the Senate and House committees on agriculture, NEDA-DBCC, and the DA. The reports (both the MEAP measures and the analyses of indicators and policies) will also be available, and disseminated, to the public. It is through the regular reporting and extensive dissemination of MEAP indicators and analyses that MEAP becomes useful and effective investment for improved governance.

- 6. Capacity building. Apart from the decisions on which agency to lodge MEAP and on the organization of the Steering Committee, the next most important implementation issue has to do with training of both the technical staff at PIDS and the technical staff of concerned agencies that will provide the data and those that will use the results of MEAP. The computations of the MEAP measures are likely to be straightforward if the methodology and the corresponding formulas are all in a software/computer program. On the input side, the major challenge is only in terms of ensuring that the data to be inputted is properly adjusted to conform to the requirements/framework of the MEAP measures. The more important training challenge is on the output side, that is, the understanding and use of the MEAP measures and analyses. The data base needed to estimate the MEAP measures is actually extensive and rich such that significant insights can be drawn from a deep understand of the underlying data of the MEAP measures themselves together with the MEAP estimates. Indeed, it is likely that there many more correlative or supplementary or complementary analyses that can be done from the underlying data base in addition to the analyses relying on the MEAP measures themselves. Thus, perhaps the best training for the use and application of MEAP estimates and analyses is to institute a program of joint analyses by some recognized researchers with selected technical staff members of concerned agencies (e.g., NEDA, DBM, CPBD, DA, BAS, SEPO) using both the underlying data base and the MEAP estimates. It is suggested here that appropriate budget is reserved for this function for a few years of the implementation of MEAP so that there emerges a pool of analysts in the bureaucracy (and academe) who can fruitfully utilize the wealth of data of the MEAP.
- 7. *Outreach*. The willingness of concerned agencies to provide the needed information to MEAP as accurately and timely as possible depends not only on the legislative mandate but also on the usefulness of MEAP to the agencies without overly taxing the operations of the concerned agencies to meet the demands of MEAP per legislative mandate. The most important challenge for

293

MEAP is to show to the concerned agencies that in fact **MEAP can be a important and useful management tool for each of the concerned agencies**. Thus, the critical importance of MEAP outreach to the concerned agencies. For example, MEAP staff would have to work closely with the staffs of the concerned agencies on how to simplify the forms and/or cull the necessary information for MEAP from the current data forms, or the usefulness to them (and not only to MEAP) of having additional information that would regularly monitored by them, and how such information culled out from MEAP and from their individual agency files could provide better insights for their own operations. All of the above can only be attained if there is continuing and harmonious working relationship between MEAP staffs and the staffs of the concerned agencies.