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## **MTID DISCUSSION PAPER NO. 78**

# AGRICULTURAL POLICIES IN INDONESIA: PRODUCER SUPPORT ESTIMATES 1985-2003

Marcelle Thomas and David Orden

Markets, Trade, and Institutions Division

International Food Policy Research Institute 2033 K Street, N.W. Washington, D.C. 20006 U.S.A. http://www.ifpri.org

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#### ABSTRACT

As in many other developing countries, the concerns about food security in Indonesia during the 1980s and early 1990s resulted in policies aimed at achieving selfsufficiency in food crops. The Government of Indonesia (GOI) combined price interventions and economic incentives to encourage agricultural production, especially of the staple crops. From 1985 to 1998, Indonesia started a series of domestic and trade reforms emanating from a combination of unilateral undertakings, the country's commitments to the WTO, and the government's agreement with the IMF following the 1997/98 financial crisis.

This study computes nominal protection rates and producer support estimates (NPR and PSE) for Indonesia for the period 1985-2003 for six agricultural commodities, rice, maize, sugar, soybeans, crude palm oil, and natural rubber (representing more than two-thirds of Indonesian agricultural output) in an attempt to quantify the net effects of these policies. The NPRs and PSEs computed for Indonesia show that in spite of the reforms, the GOI has protected its agriculture over the past twenty years, although not uniformly across commodities. Although the reforms went a long way in reducing trade and domestic regulations on agricultural products, the study results demonstrate a return to protection for some commodities in recent years.

The results presented in this study must be interpreted with the usual caution associated with the estimation of support indicators in general and the PSEs in particular due to the assumptions and judgments made when computing their various components. In the study, the choice of transportation costs and marketing margins may have underestimated the value of these activities, inflating or deflating (depending on the cost) the value of support accruing to producers. The choice of markets to compare international and domestic prices, in spite of the attention given to the differences in processing and accounting for marketing costs, may raise the issue of whom is actually benefiting from the support, the farmer, the miller, or the trader. The process of "scaling-

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up" the PSE values to all of agriculture without examining the policies affecting the noncovered commodities underscore the necessity for a more comprehensive study, which would include other agricultural sectors, for example the livestock sector. Nevertheless, a reasonable assessment of support for agriculture in Indonesia over the period 1985-2003 emerges from the analysis presented.

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# ACRONYMS

APEC	Asia-Pacific Economic Cooperation
AoA	Uruguay Round Agreement on Agriculture
AFTA	ASEAN Free Trade Agreement
ASEAN	Association of Southeast Asian Nations
BAPPENAS	National Development Planning Agency
BIMAS	Mass Guidance Program—Bimbingan Masal
BPPC	Cloves Marketing Agency
BPS	Central Bureau of Statistics
BULOG	Food Logistics Agency
СРО	Crude Palm Oil
DAI	Development Alternatives, Inc.
GOI	Government of Indonesia
IMF	International Monetary Fund
ITR Co	International Tripartite Rubber Company
KKPA	Koperasi Kredit Primer Anggota, Prime Cooperative Credit for Members
KOPTI	Manufacturer cooperative for Soybeans
LIFDC	Low income food deficit countries
MPS	Market Price Support
NPC	Nominal Protection Coefficient
NPIK	Special Importer Identification Number
NPR	Nominal Protection Rate
OECD	Organization for Economic Cooperation and Development
OPK	Special Market Operation
PIR/NES	Perkebunan Inti Rakyat, Nucleus Estate and Smallholder Scheme
PSE	Producer Support Estimate
RASKIN	Rice for the poor (social protection program)
SPS	Sanitary and phytosanitary
TRQ	Tariff Rate Quota
WTO	World Trade Organization

#### AGRICULTURAL POLICIES IN INDONESIA: PRODUCER SUPPORT ESTIMATES 1985-2003

Marcelle Thomas and David Orden<sup>1</sup>

#### 1. INTRODUCTION

Both developed and developing countries use a wide variety of domestic and trade measures aimed at agriculture. Studies have shown that developed countries tend to protect their agriculture (OECD, 2003), while policies followed by developing economies have historically resulted in a bias against agriculture (Schiff and Valdés, 1992). Either way, policy interventions can have a distorting effect on agriculture and trade. Since 1987, the Organization for Economic Cooperation and Development (OECD) has adopted and refined measures of annual domestic support to agriculture for its member countries.<sup>2</sup> Although the OECD has started to include some non-member countries (such as transition economies) in its monitoring and evaluation exercises, currently no comparable systematic set of measures of agricultural policies exist for developing countries.

Assessing the nature and level of agriculture support (or taxation) will clarify the role of agriculture domestic policies and border trade policies in developing countries. Many developing countries have undergone a series of economic policy reforms, sometimes unilaterally, often under the World Bank or International Monetary Fund (IMF) structural adjustment programs, but also in accordance with commitments as members of the World Trade Organization (WTO). This has gone a long way in reducing the bias against agriculture but many developing countries still use complex and obscure trade and domestic policies motivated by conflicting political and economic goals. The

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<sup>&</sup>lt;sup>2</sup> For details on how the concept and these measures developed, see Josling and Tangermann (1989).

net effect can be either to protect or disprotect the production of various agricultural commodities.

This study is part of a project to compute producer support estimates (PSEs) in agriculture for selected Asian developing countries, using a common methodology drawing on the one developed by the OECD, as well as variant definitions and applications (Mullen et al., 2004).<sup>3</sup>

Nominal protection rates and producer support estimates (NPR and PSE) are evaluated for Indonesia, which after 30 years of relative stability and strong economic growth is facing the challenges of recovery after a major financial crisis in 1997/98 (Barichello, 2000; Temple, 2003). Figure 1.1 illustrates the almost uninterrupted growth that the country experienced between 1968 and 1997 (a growth rate above 7 percent on average). Evidence of Indonesia's success has been reviewed by an abundant literature, which has been unanimous in crediting the former president Suharto's economic policies: stable macroeconomic policies, strong public investment favorable to agriculture, and successful management of oil boom windfalls to fund agriculture development (Hill, 2000; Temple, 2003; ADB/SEARCA/IFPRI/CRESCENT, 2004). The agriculture GDP growth rate has been slower and more volatile during this period (Figure 1.1). The 1997/98 financial crisis resulted in a drop in GDP but the non-agriculture sector was much more affected than agriculture because of the nature of the crisis (ADB/SEARCA/IFPRI/CRESCENT, 2004).

In agriculture, achieving self-sufficiency in food crops remains the government's main approach to assuring food security, but it increasingly conflicts and competes for resources with other government goals, such as poverty alleviations, decentralization and diversification of the agricultural sector toward higher value crops (BAPPENAS/USAID/DAI, 2001).

<sup>&</sup>lt;sup>3</sup> Among recent studies on variants of PSEs for developing economies are Valdés (1996) for eight Latin American countries, Pursell and Gupta (1998) and Gulati and Narayanan (2003) for India, and Valdés (2000) for five transition economies.

In the domestic context, the government is phasing out the role of its largest stateowned agency, Indonesia's Food Logistics Agency, BULOG, while devising new programs to promote the production of food crops.<sup>4</sup> While in 2000, the Government of Indonesia (GOI) reverted to border measures to protect selected commodities such as rice and sugar, it is committed to trade liberalization in the context of the IMF induced reforms, and its membership in the WTO (IMF, 1998; WTO, 2003b).

The computation of indicators of support is a first step in measuring the quantitative effects of changes in government policies as they pertain to agriculture in general or to selected commodities specifically. Support indicators are also intended to provide a framework to identify and classify the government policies they measure. The study for Indonesia covers the period 1985-2003 and NPRs and PSEs are computed for six agricultural commodities, rice, maize, sugar, soybeans, crude palm oil, and natural rubber. These six commodities account for more than two-thirds of Indonesia's agricultural output during the period.





Source: Authors' calculations based on data from WDI (2003).

<sup>&</sup>lt;sup>4</sup> One such program was Gema Palagung (1997/98), a self-reliance program aimed at developing the production of rice, maize, and soybean, and which has since largely been absorbed into other initiatives (Muslim, 2002)

#### 2. BACKGROUND AND AGRICULTURAL OVERVIEW

For nearly 30 years, under the "New Order" regime of Suharto, Indonesia experienced a transformation in performance (Figure 1.1; Temple, 2003). The economy grew, benefiting from two oil booms as well as from policies aimed at stabilizing the macroeconomic environment and developing the agricultural sector. Although growing corruption and mismanagement of financial institutions led the economy into trouble, the macro component of the economy was thought to be the best among developing economies (Barichello, 2000; Hill, 2000; Temple, 2003). Suharto focused on economic development and the GOI undertook major reforms, outlined in detail in a series of five-year plans ("Repelita I to VI) starting in 1969/70 (Indonesia, 1995). From the late 1960s to 1997, in agriculture Indonesia made significant progress in increasing domestic food production, stabilizing food prices, reducing poverty and increasing food security.<sup>5</sup> The government also invested in broad based rural development including infrastructure, health, and education (BAPPENAS/USAID/DAI, 1999; Magiera, 2003).

In the period from 1965 until the crisis in 1997/98, GDP per capita rose more than fourfold and life expectancy went from 43 to 68 years, dropping slightly after the crisis to 66 years. The incidence of poverty declined and progress was made raising the adult literacy rate of the population from 60 percent in 1970 to 85 percent in 1997 and 89.3 in 2001 (Table 2.1). Another aspect in the country's development is the decrease in the share of employment in agriculture from 75 percent to below 50 percent and the increase in the share of the population living in urban areas from 16 to 44 percent (Temple, 2003; WTO, 2003b). In 2002, Indonesia ranked 111<sup>th</sup> out of 177 countries in human development, having improved consistently its overall index from 0.582 in 1985 to 0.692 in 2002 (UNDP, 2004). In spite of its performance, Indonesia is a low-income country with a GDP per capita of US\$ 678 in 2001 (just above half of its 1997 level of US\$ 1,110). It has been classified also as a low-income food-deficit country (LIFDC).

<sup>&</sup>lt;sup>5</sup> The "Third Plan," which covered the period 1979/80 to 1984/85, was called the Trilogy of Development because it included three government's objectives: the equitable distribution of development gains, economic growth, and the maintenance of political and economic stability (Indonesia, 1995).

The 1997/98 Asian crisis led the country into a deep recession evidenced by a GDP drop of -13 percent, an inflation rate of more than 77 percent, and an increase in the unemployment rate to 17 percent (WTO, 2003b). The Rupiah depreciated by nearly 52 percent. The economy started to recover in 2000 at an average rate of 4 percent (2000-2001, Figure 1.1) but with an unemployment rate of 8 percent.<sup>6</sup> The poverty level measured by the share of the population below the poverty line grew to 27 percent in 1999 from 15 percent in 1996 (Table 2.1). Trade also suffered from the crisis, and in 1998 merchandise export and imports declined by 10.5 and 31 percent, respectively. Finally, the country experienced also a political crisis, which forced Suharto to step down and general elections to be held in 1999.<sup>7</sup>

Manufactured products and fuels, which together account for 80 percent of merchandise trade, continue to dominate Indonesian trade (Table 2.1). Indonesia's main trading partners are Japan, the EU, the United States, and Singapore (WTO, 2003b). It is also a member of the Cairns group and the G-20 within the WTO.<sup>8</sup>

As for many developing countries, agriculture is a major sector in the Indonesian economy. It represents 17 percent of GDP, employs 45 percent of the labor force, and is home to 57 percent of the poor (FAO, 2002). Agriculture trade accounts for 12 percent of exports and 17 percent of imports (Table 2.1).

Indonesia is the world largest producer of coconuts, second largest producer of copra, palm kernels, palm oil, and natural rubber, and the third largest producer of rice

<sup>&</sup>lt;sup>6</sup> The official figure does not account for underemployment.

<sup>&</sup>lt;sup>7</sup> Suharto's authoritarian regime lasted from 1965 to 1998. Before his seventh consecutive five-year term in office, and following the mid-1997 financial crisis, he stepped down. The Presidential election in October 1999 brought Abdurrahman Wahid to the presidency and Megawati Soekarnoputri was appointed president in a special session on July 23, 2001, ahead of the scheduled date of August 1, 2001 (Indonesia, 2004).

<sup>&</sup>lt;sup>8</sup> The eight developing country Cairns Group members (Argentina, Bolivia, Brazil, Chile, Indonesia, Paraguay, the Philippines and South Africa) are also members of the G-20. The G-20 emerged just prior to the WTO ministerial meeting in Cancun (September 10-14, 2003) as a group of developing countries with shared concerns regarding the lack of developed countries' willingness to reform their agriculture policies with regard to subsidies and market access. The G-20 group of countries includes 63 percent of the world's farmers and accounts for 20 percent of world agricultural production, 26 percent of total world agricultural exports and 17 percent of total world agricultural imports (Jaura, 2003).

(EEAU, 2000). Production is concentrated in the islands of Java, Sumatera, and Sulawesi. Smallholder farms (average size of farm of one hectare) occupy the largest share of cultivated land (87 percent), and grow mostly food crops (90 percent of total rice and maize output). Large-scale farms, state or privately owned, account for a small share of agricultural output but the larger share of agricultural exports, such as rubber, palm-oil, coffee, and cocoa (EEAU, 2000). Agricultural GDP is still dominated by food crops (51.7 percent) and rice dominates among these crops. Agriculture's share of GDP has remained on average the same for more than a decade, with fisheries increasing in importance (Table 2.2).

The 1997/1998 financial crisis resulted in a shortage of foreign exchange and the depreciation of the Rupiah affecting mostly the manufacturing sector and employment in urban areas. During the same period, Indonesia experienced the worst drought in 50 years, following the El Niño weather system, putting additional pressure on agriculture, more specifically the production of food crops (EEAU, 2000).

Land area (million km <sup>2</sup> )	1.9	Urban share of population (%, 2002)		44.5
Population (million, 2002)	217.1	Nominal GDP at current market prices (US\$ billions)		141.6
Population growth (%, 1995-2001)	1.6	GDP per capita (US\$)		678
UN human development index (2002)		GDP per capita annual growth rate (%)		1.8
- Overall ranking	111 <sup>th</sup>	GDP at constant 1993 prices (Rps billions)		411,690.7
<ul> <li>Category</li> <li>Ranking within category</li> </ul>	gory     Medium human development     GDP shares (%): Agriculture Industry       ang within category     56th     Services (incl. construct, elect, gas & water)			17.0 47.3 35.8
		Poverty indicators (share in percent of the population under the national poverty line, %)		15.7 (1996) 27.1 (1999)
Life expectancy at birth (years, 2002)	66.6	Globalization indicator (2002) <sup>1</sup>		59
Infant mortality rate per '000	40.9			
Adult literacy (%, 2002)	87.9	Structure of trade	Exports	Imports
Enrolment ratio (net) in education (%)	- primary 91.9			
	- secondary 48.8	Merchandise (US\$ billions)	56	31
		Agriculture (%)	13	17
		Manufactures (%)	56	61
		Oil and gas (%)	25	18
		Other (%)	6	4

Table 2.1—Indonesia main economic and social indicators (2001 unless otherwise indicated)

Source: Adapted from WTO (2003b), and updated for later years from UNDP (2004), and WDI (2003). Note: <sup>1</sup> Foreign Policy (2004).

Sectors		
	1991-1995 annual	1999-2002 annual
	average	average
	(million	US\$)
Agricultural GDP <sup>1</sup>	26,828	26,886
	1991-1995	1999-2002
Share of Agricultural GDP <sup>2</sup>	(in per	cent)
Food crops	55.8	51.7
Non-food crops	16.6	15.6
Livestock	11.4	12.0
Forestry	6.9	6.4
Fisheries	9.3	14.3
	Production	Share in the value of production
Commodity Output (2000-2003 average) <sup>3</sup>	(millions mt)	(percent)
Rice (milled)	34.8	40.5
Maize	9.9	5.5
Soybeans	0.8	0.9
Sugar (refined)	1.9	2.9
Palm Oil (CPO)	8.8	11.5
Natural Rubber <sup>4</sup>	1.6	3.9
Total		65.2

# Table 2.2—Agriculture in the Indonesian economy (1991-95 and 1999-2002)

Sources: <sup>1</sup>Indonesia Monthly Statistical Bulletin, September 2003; <sup>2</sup>1991-1995, Fuglie and Piggott (2003: Table 2); 1999-2002, Authors' calculations based on data from Indonesia Monthly Statistical Bulletin, September 2003; <sup>3</sup> Authors' calculations based on PSE estimates (see Tables 4.2 and 4.3 for details); <sup>4</sup> 2000-2002 only for natural rubber.

#### **3. AGRICULTURAL POLICIES**

The direction of Indonesia's economic and development policies, often follows the significant exogenous shocks resulting from fluctuating international oil prices (Hill, 2000). After a period of significant growth attributed to the two oil price booms in the 1970s (1971-74 and 1978-80), which benefited Indonesia as an oil exporter, the early 1980s marked a decline in GDP growth, when oil prices declined.<sup>9</sup> The years that follow until the early 1990s marked a period of liberalization and recovery during which Indonesia developed its non-oil sectors (Hill, 2000).

Bautista et al. (1997) refer to the mid-1980s as a "watershed" in economic policymaking in Indonesia. From 1985 to 1998, Indonesia started a series of domestic and trade reforms emanating from a combination of unilateral undertakings, the country's commitments to the WTO, and the government's agreement with the IMF following the financial crisis (APEC, 2002; Magiera, 2003).

#### 3.1 DOMESTIC POLICIES

As in other developing countries, the concerns about food security during the 1980s and early 1990s, resulted in policies aimed at achieving self-sufficiency in food crops, especially rice. The GOI combined price interventions and economic incentives through subsidized inputs, substantial investment in irrigation, and rice marketing activities in the outer islands to encourage agricultural production, especially of the staple crops (Piggot et al., 1993; Bautista et al., 1997; WTO, 1998). Until 1998, policies included intensification programs, "BIMAS", for rice, field crops, and livestock (combination of subsidized inputs and guaranteed prices for output) and "nucleus estate" programs aimed at integrating smallholders into large plantation production (Fuglie, 2001).<sup>10</sup>

<sup>&</sup>lt;sup>9</sup> In the 1980s, crude oil and petroleum products contributed about two thirds of total exports, a fourth of GNP and 70 percent of government revenue (Bautista et al., 1997).

<sup>&</sup>lt;sup>10</sup> These programs promoted high-yield varieties together with subsidized fertilizer, pesticides, and credit and offered technical assistance to farmers on the new cultivation techniques (Fuglie, 2001).

During the late 1980s and 1990s, one of the major domestic reforms affecting agriculture was the phasing out of input subsidies. The subsidies on pesticides were removed in 1989 (WTO, 1998). Fertilizers subsidies, by far the largest input subsidy, were eliminated in December 1998 (Barichello, 2003), but reinstated in 2003.

Under conditions from the IMF, the GOI agreed to structural reforms, including restructuring or privatizing key state enterprises. By the summer of 1998, the government ended BULOG's monopoly on trade and replaced its general consumer rice price stabilization through market interventions with a targeted rice distribution program to poor households, called OPK Beras, which in 1999 provided 20 kilograms of subsidized rice per household to 10 millions households (Daly and Fane, 2002).<sup>11</sup>

#### 3.2 TRADE POLICY REGIME

Agricultural trade in Indonesia has been heavily regulated by tariffs, import licensing, export taxes and bans, and informal export quotas. To encourage domestic processing industries, export taxes were levied on primary products, so as to provide inputs to the processing sector. Even processed agricultural products were subjected to import restrictions (Bautista et al., 1997). Some reforms were undertaken in the mid-1980 which reduced the number of tariff rates, lowered the ceiling on tariff rates, and raised the number of import items with very low tariff rates. In spite of these reforms, products corresponding to 54 percent of domestic agricultural production remained on the "Restricted Goods List." Import monopoly for most of these commodities was under the control of BULOG and other state trading companies (Bautista et al., 1997). Three categories of commodities were subject to export control: certain items were banned, controlled by the Department of Trade, or restricted to licensed exporters. The majority of these items originated in the agricultural sector and included rice, soybean flour and vegetable oils (Piggot et al., 1993).

Although agriculture was mostly left out of the 1985 trade reforms, further trade reforms in 1991 reduced the share of agricultural products under import licensing

<sup>&</sup>lt;sup>11</sup> In 2002 the name was changed to RASKIN.

restriction to 30 percent. However rice, soybean and sugar continued to be regulated (Bautista et al., 1997). Magiera (2003) assesses that the 1995 WTO Agreement on Agriculture (AoA) was not very constraining on Indonesia trade policies because the country, unilaterally, had committed to a tariff reduction schedule (Pakmei schedule, 1995-2003, Table 3.1), which upon completion would have reduced the average tariff on agriculture to 13.2 percent, far below the average agricultural bound tariff of 47.7 percent (Table 3.2; Magiera, 2003).

The agreement with the IMF put pressure on Indonesia to reduce its tariffs on agriculture: all food tariffs were to be reduced to 5 percent and non-food agricultural tariffs to a maximum of 10 percent by 2003 (Magiera, 2003). On this basis, the average applied import tariff for agriculture was 8.3 percent in 2002 (Table 3.2). By the end of 1998, Indonesia also agreed to liberalize rice trade to private traders, removing BULOG's monopoly (Wailes, 2003). But with the end of the IMF program (2003) the trend toward protectionist and other interventionist measures in agricultural trade have reemerged (Wailes, 2003; Ray, 2003). Import tariffs and special import licensing continue to affect rice, and sugar.

The 1990s trade reforms served also to relax export controls, which have been extensively used in Indonesia, especially affecting non-food products. Under the 1998 IMF agreement, Indonesia agreed to eliminate export restrictions but maintained its export taxes on palm oil, crude palm oil and their derivative products, wood, and rattan. Indonesia also continues to regulate certain commodity exports (manioc, coffee and its extracts, rubber, veneer and plywood, and teakwood) using a combination of voluntary export and supply management arrangements aimed at reducing world over-supply and the resulting depressed prices. Voluntary export quotas of coffee terminated in 2002 while those for rubber continued until mid 2002 (WTO, 2003b).

Starting in 2002, Indonesia, along with the other five original ASEAN members (1967), implemented the final phase of the ASEAN Free Trade Agreement (AFTA, 1992). Indonesia has reduced tariffs for all products included in its original commitment (7,206 tariff lines) to five percent or less for products of at least 65 percent ASEAN

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origin. Despite the accelerated progress Indonesia maintains rice and sugar in the sensitive list, which are exempted from tariff reduction (Economic Intelligence Unit, 2003; USTR, 2004).

#### 3.3 WTO AGRICULTURAL COMMITMENTS

#### Market Access

Indonesia notifies the WTO on tariff-rate quotas (TRQs) for rice and milk and cream fats and products: the rice TRQ is 70,000 mt with an in-quota tariff rate of 90 percent; and the milk and cream TRQ is 414,700 mt with an in-quota tariff rate of 40 percent. But since the implementation of the WTO AoA, Indonesia's imports of these products have been in excess of the quota and applied tariff rates have been lower than bound in-quota rates. TRQs for milk and cream have been abolished since 1998. The current tariff for these products is 5 percent with no quota. Import surcharges were eliminated in January 1996 (WTO, 2003b and 2003c).

All agricultural tariff lines are subject to bound tariff rates and these rates are to decrease by 2004 (Table 3.3). The average applied tariff rate has decreased between 1998 and 2002, but more so for industrial products than for agricultural products (Table 3.2). WTO (2003b) estimates the average applied tariff for agriculture (ISIC classification) to be 4 percent in 2002 down from 4.2 in 1998.<sup>12</sup> The large gap between Indonesia's applied tariffs and its high bound tariffs offers the country considerable flexibility in negotiating for more open markets by other countries in exchange for reducing its tariffs bindings (Magiera, 2003).

Sanitary and phytosanitary (SPS) and food quality regulations have led to import restrictions, especially on animals and animal products and other food items requiring a *halal* certificate (Islamic purity on animals and products derived from animals).

<sup>&</sup>lt;sup>12</sup> The average applied tariff for agriculture gives different values depending on the classification used.

#### Domestic Support

The GOI notifies the WTO only on support provided through various development programs under the green box measures, which are exempt from the reduction commitment (Table 3.4). Measures classified under "general services" constitute more than half of total expenditures on green box measures.

Following the crisis, the second largest program, nearly a third of total support in 2000, is domestic food aid (Table 3.4). Public stockholding for food security picked up in 1998 and 1999, also during the crisis, but declined to pre-crisis levels in 2000. The measure includes buffer stocks to cover minimum requirements, and operational stocks for budget group allocation and price stabilization.<sup>13</sup>

The composition of general service expenditures changed in 2000. Total expenditures have decreased by 40 percent, mainly due to the elimination of expenditures on estate crops development programs. Expenditures on agricultural research also declined by 40 percent, but expenditures on development programs for livestock and agribusiness have doubled and tripled, respectively (Figure 3.1).

Although the GOI sets administered prices for both rice and sugar, it lacks the resources to support domestic prices at the administered level. Indonesia did not commit to an aggregate measure of support to agriculture (AMS), so the commodity-specific *de minimis* standard (10 percent of value of production for developing countries) applies to every product (Magiera, 2003).

#### Export Subsidies

Indonesia's notification of export subsidies for rice allows the government to dispose of surplus stocks, but since the implementation of the WTO AoA, Indonesia has not subsidized rice exports (Magiera, 2003).

<sup>&</sup>lt;sup>13</sup> Budget group allocation is the distribution of rice to military personnel and civil servants.

Figure 3.1—General services expenditures (1995-2000)



Source: Data from WTO notifications, various years.

# Table 3.1—Indonesia pre- and post-crisis (1997/98) international trade and agriculture policies: commitments and reforms

International trade com	nitments
Tariffs	• Import tariffs of <20% in 1995 reduced to a maximum of 5% in 2000.
(Pakmei schedule and	• Import tariffs of >20% in 1995 reduced to a maximum of 20% in 1998 and to a
IMF)	maximum of 10% in 2003.
Non-tariffs	Elimination of restrictions on import licenses:
	• Dairy products switched from approved importers (IT) to general importer (IU).
	• Cloves switched from the regulation of BPPC <sup>1</sup> to IU.
	• The importation of sugar and rice is liberalized, previously imported only by
	producer importers.
Anti-Dumping	To date Indonesia has investigated 20 cases, and imposed anti-dumping duties on 7
Measures	non-agriculture products but none on agricultural products.
WTO Special	To date no special safeguard measures have been imposed.
Safeguard Measures	
State trading-	GOI notified the WTO that both BULOG and BPPC operate as state trading
enterprises	enterprises (STEs).
Reforms following the 19	197/98 financial crisis
Trade	• September 1998: BULOG import monopoly on rice, sugar, wheat and wheat
	flour was abolished.
	• Soybeans:
	1998, addition of tariff.
	• Rice:
	September 1998 to December 1999, import tariff was set at 0%.
	<ul> <li>January 2000 to present, specific duty of Kp450/kg has been applied to imports</li> <li>(25, 200/ tariff equivalent)</li> </ul>
	(25-50% tarm equivalent). ✓ Import licenses (NPIK) given to private traders
	$\checkmark$ In January 2004, has on rice imports was imposed until June 2004, but was
	later extended
	• Palm oil
	In 1998 ban on exports of crude nalm oil (and its products) followed by export
	tax rates ranging from 40 to 60 percent Export tax rate reduced to 10 percent by
	1999. and to 3 percent by 2003.
	• Sugar:
	$\checkmark$ In 2000 import licensing is replaced by a 20 percent tariff for raw sugar and a
	25 percent tariff for refined sugar.
	✓ In 2002 import ad-valerum tariffs are replaced by specific import duties of
	Rp.550/kg for raw sugar and Rp.700/kg for white sugar.
	• Export quotas on coffee and rubber continue to be used.
Domestic	• Fertilizer subsidies are removed in December 1998, but reinstated in 2003.
	• Rice
	✓ Market price support for rice provided through BULOG: It sets the criteria and
	announces the rice procurement to the public. It buys paddy or rice from
	farmers or traders on a first come, first serve basis.
	✓ From August 1998 to December 2001, the GOI replaced its general consumer
	rice price stabilization through market interventions with a targeted rice
	distribution program to poor households, called OPK Beras until a change in
	name to RASKIN in 2002.

Sources: Casson (2000); WTO (2003a); Mageira (2003). Note: <sup>1</sup>State owned enterprise for Cloves.

# Table 3.2—Tariff structure (1998 and 2002)

		Simple Av Applied	verage Rate	Simple Average Bound Rate	
		1998	2002	1998	
Total		9.5	7.2	37.6	
	Agricultural products (HS classification) <sup>1</sup>	8.6	8.3	47.3	
	Industrial products (HS classification)	9.7	7.0	35.9	
	Textiles and clothing	14.6	10.5	29.3	

Source: WTO (2003b: Table III.1). Note: <sup>1</sup>See footnote 10.

# Table 3.3—WTO bound tariff rates for selected agricultural commodities (1994 and 2004)

	1994	2004
	(%)	(%)
Cloves	75	60
Dairy products	50-238	40-210
Soybean meal	45	40
Garlic	60	40-50
Wheat	30	27
Wheat flour	30	27
Rice	180	160
Sugar	110	95
Soybeans	30	27
Alcoholic beverages	170	150

Source: Magiera (2003: Table1).

# Table 3.4—Indonesia's green box measures (1995-2000)

Measures	1995	1996	1997	1998	1999	2000
			Rupiah b	illion		
General Services	366.1	407.4	557.2	622.3	825.9	503.6
Public stockholding for food security	32.0	38.3	55.5	264.5	346.5	65.7
Domestic Food Aid				411.0	425.6	305.5
Payments for relief from natural						
disasters	2.7	4.0	4.8	11.8	14.8	12.7
Total	400.8	449.7	617.5	1309.6	1612.8	887.5
Exchange rate (Rp/US\$)	2239	2348	2953	9875	7809	8527
Total (US\$ million)	179	192	209	133	207	104

Source: WTO (2003b).

#### 4. NPR INDICATORS OF SUPPORT

#### 4.1 NPR RESULTS FROM SELECTED INDONESIA STUDIES

Indonesia was not included in two major studies on indicators of support of agriculture for developing countries, the PSE study conducted by the USDA-ERS (1992) and the Kruger, Shift, Valdés (1988), which calculated direct and indirect nominal protection rates (NPRs).<sup>14</sup> Other studies have computed NPRs and other indicators for Indonesia and we review here two analyses (Table 4.1).<sup>15</sup> In the case of Indonesia we have not identified any previous published study that has fully computed PSEs.

In a 1993 IFPRI study, Gonzales et al. investigate the economic incentives and competitiveness of food crops in Indonesia in an effort to suggest policies aimed at diversifying the country's agriculture under changing domestic and international environments. The authors estimate direct and indirect NPRs, and effective protection rates (EPRs) for rice, maize, soybeans, sugar, and cassava for 1986 following the Kruger, Schiff, Valdés (1988) methodology. They compute these indicators by regions, taking into account the costs of processing, marketing, transporting and distributing the crops. Three trade scenarios were considered: import substitution, export promotion, and withincountry interregional trade. The NPRs are also computed at two levels, the farm and wholesale levels. Following Kruger, Schiff, Valdés, they estimate the equilibrium exchange rate, and quantify the effect of the overvaluation of the rupiah in 1985/86. They found that the indirect effect is negative and not trivial (-16 percent) and at the national level overrides the modest direct protection for rice and maize. For sugar and soybeans, the high direct protection outweighs the negative indirect effects (Table 4.1). For cassava (not shown here), the only exportable, the negative indirect effect adds to direct negative protection.

<sup>&</sup>lt;sup>14</sup> Indonesia was included in and earlier USDA-ERS study (Ross, 1990). The study computed PSEs for rice from 1982-1987.

<sup>&</sup>lt;sup>15</sup> Fane and Condon (1996) also computed real effective rates of protection (RERP) of 131 sectors for 1995, including 21 agricultural sectors and compared them to 1987 RERPs computed by Fane and Phillips (1991). They observed a fall in the rate in agriculture from 9 to 4 percent.

In a recent study, Richard Barichello (2003) examines the pattern of policies for selected food crops (rice, maize, sugar, and soybeans) and fertilizers from 1985 to 2000 and its potential effects on water demand. Barichello examines the budget structure of the GOI and computes nominal rates of protection. Although specific allocations of the budget expenditures to individual crops were not available, the author concludes that border measures have been the government's dominant instrument in supporting agriculture. The relative dominance of border measures has increased, especially since 1999 when the fertilizer subsidy, a major budgetary expense (Rps 650 billion on average from 1984 to1990 and Rps 357 billion on average from 1991/92 to 1998/99), was eliminated. Barichello observes that the level of support has been declining in general, except for rice and sugar, which continue to benefit from policy transfers relative to other commodities (Table 4.1).

#### 4.2 BASIC MODEL SET-UP AND DATA SOURCES

This paper extends the above studies, data allowing, in several ways:

- By using transport and marketing margins as Gonzales et al. (1993) to adjust the international and producer observed prices, but extending the period of coverage from 3 years to 18 years.
- Extends the crop coverage in Barichello (2003) and includes estate crops in order to capture a larger share of agricultural production.
- Applies budgetary outlays to individual crops to estimate commodity specific transfers.
- Expands the time line to recent years (2001 to 2003) to capture effects of the policy reforms during additional post-crisis recovery years.

NPRs are a first step to estimate the amount of price support, the market price support (MPS), for the selected commodities. The nominal protection of a commodity is one of the simplest indicator measures of the impact of government policy on output and inputs. It expresses the divergence, due to government's interventions, between the commodity's domestic price (also called producer, private or incentive price), which reflects current policies, and its border price (also called a social or reference price), which abstracts from these distortions.

The NPR for a specific commodity is expressed in percentage terms:

$$NPR = \left(\frac{P_p - P_{ar}}{P_{ar}}\right) \times 100 \tag{1}$$

where:

 $P_p$ : average producer price (in domestic currency)

 $P_{ar}$ : reference price adjusted to equivalence with the producer price (in domestic currency)

In the case of imports, reference and producer prices are computed as followed:

$$P_{ar} = P_{cif}^{world} \times ER + TC \tag{2}$$

$$P_{cif}^{world} = P_{fob}^{world} \times (1 + IF)$$
(3)

where :

 $P_{cif}^{world}$ : world price adjusted for international freight (in \$US)

ER : official exchange rate (Rp/\$US)

*TC* : internal handling, transport and processing costs from port to wholesale market (in domestic currency)

 $P_{fob}^{world}$ : world price of the commodity at an exporter's port (in \$US)

*IF* : international freight expressed as a rate of the world price (in \$US).

 $P_p$  must also be adjusted to reflect equivalent price at wholesale market. Thus:

$$P_p^{wholesale} = P_p^{farmgate} (1 + MM)$$
(4)

where:

*MM* : marketing and processing margin from farmgate to wholesale market expressed as a rate of the farmgate price.

In the case of exports, the reference price is the country's f.o.b price expressed in domestic currency less internal handling, transport and processing costs from port to wholesale market (TC).

Tables 4.2 and 4.3 describe the definitions and sources of the various components of the NPRs computed for Indonesia. Several issues of measurements are reviewed regarding the selection of reference prices, the level and nature of adjustments, and the regional variability.

- The trade status of each commodity is measured by the commodity net exports (exports less imports) for the period 1985-2003. The trade status is important when determining the appropriate reference price and price adjustments (see Equations 2 and 3). Indonesia's trade status in rice and maize as a net importer has been consistent in the 1990s (except for 1993 for rice and 1998 for maize), but less so in the 1980s. Mullen et al. (2004) estimates MPS for wheat in India under import and export assumptions, to accommodate the fluctuations in trade patterns. A third alternative is also used by computing a market-clearing equilibrium price in lieu of an export or import adjusted reference price (Mullen et al., 2004). Considering that the trade fluctuations at the beginning of the period are small, the measurements for rice and maize for Indonesia assume that both commodities are importable and use the import hypothesis. The other commodities have been consistently net imports in the case of sugar and soybeans or next exports in the case of palm oil and rubber.
- The reference price at the border can be the c.i.f. equivalent "world price" for imports (f.o.b. for exports) or alternatively the import unit value (or export unit value for exports). The advantage of selecting the import unit value as the reference price is to avoid having to estimate international freight to get to a c.i.f.

equivalent. But in some cases, the import unit value deviates from the more general world price, like in the case of rice, maize and sugar (Figures 4.1a-c). For these commodities, the "world price" is selected and adjusted by the international freight estimates (Table 4.2). In the case of soybeans, the import unit value is judged to be a better reference price than the c.i.f. Rotterdam, although both series move in a similar trend (Figure 4.1d). In the case of exports (crude palm oil and natural rubber), the export unit value is used (Table 4.3).

- Gonzales et al. (1993)'s 1986 estimates for international and domestic transport costs, and marketing costs are extended to the period 1985-2003. International transport costs and domestic adjustments from port to wholesale are a fixed share of the world price. Domestic adjustments from farmgate to wholesale are a fixed share of the producer price.
- Rice quantities and prices are adjusted to convert the price and production of paddy rice (Gabah Kering) to milled rice equivalent (Table 4.2). In the case of sugar, the only available price data to estimate the NPRs are for refined sugar, so no processing cost adjustment was made.
- Finally, for the import commodities, the measurements are estimated at the regional level first and aggregated to give a country measure, using the share of regional production in total production as weights. The regional calculations cover 8 regions for rice, 2 (Java and off-Java) for maize, soybeans and sugar. For export commodities, crude palm oil and natural rubber, data were not available at the regional level and NPRs and PSEs are estimated at the national level.

NPR results from the two studies cited in Table 4.1 are compared to our NPR results, which are developed in the next section, in Appendix Figure A.1 for the four import commodities.



# Figure 4.1—Comparing reference price alternatives (1985-2003)



Source: Authors' calculations (see Table 4.2 for details).

		Import crops (direct effects)			
Studies	Years	Rice	Maize	Soybeans	Sugar
Gonzales et al., 1993 (average over regions) <sup>1</sup>					
• At producer price	1986	3	4	140	111
	1985	15	-10	44	173
• At wholesale price	1886	12	-6	31	81
Ĩ	1987	19	36	61	62
	1985	85	0	65	
	1986	66	31	102	
	1987	12	8	98	
	1988	4	3	67	
	1989	-4	-2	37	28
	1990	10	-66	92	14
	1991	8	5	95	37
Devichalla 2002	1992	17	10	93	52
Baricheno, 2005	1993	22	7	114	70
	1994	20	18	92	31
	1995	9	1	64	19
	1996	7	-17	39	24
	1997	6	-2	21	34
	1998	-34	-40	13	-34
	1999	35	51	76	16
	2000	37	37	32	80

# Table 4.1—Nominal protection rate measures for Indonesia (1985-2000)

Sources: Gonzales et al. (1993); Barichello (2003). Note: <sup>1</sup> A negative indirect exchange-rate effect (-16 percent) was also estimated

	Import crops					
Category	Rice (1985-2003)	Maize (1985-2003)	Soybeans (1985-2003)	Sugar (1987-2003)		
Trade status	Importable	Importable	Importable	Importable		
Source	<	FAOSTA	17 2004	>		
Reference domestic market	Wholesale	Wholesale	Wholesale	Retail		
Border Price						
• World Price (P <sub>fob</sub> )	F.o.b. Bangkok, Thai broken 15% <sup>1</sup>	F.o.b. US gulf ports, Yellow No.2	C.i.f. Import Unit Value	F.o.b. Sugar-Caribbean		
Sources	USDA-ERS (2003)	IFS (2004) on line and World Bank (2004) (various years)	FAOSTAT (2004)	IFS (2004) on line and World Bank (2004) (various years)		
• International Freight (IF) <sup>2</sup>	The IF costs range between 17 and 27 percent of the world price depending on the region.	The IF costs are 19 percent in Java and 24 percent off Java of the world price.	Included in the import unit value.	The IF costs are 47 percent in Java and 58 percent off Java of the world price.		
Source	Gonzales et al., 1993	Gonzales et al., 1993		Gonzales et al., 1993		
• Exchange Rate (ER)	Monthly average for each year	Monthly average for each year	Monthly average for each year	Monthly average for		
Sources	<	Bank of Indonesia (2002)	) and USDA-FAS (2004)	>		
Internal Cost Adjustments for importers (TC: Port charges, handling, Transport from port to wholesale market) <sup>2</sup>	5 percent of the border price, all regions.	8 percent of the border price, all regions.	5 percent of the border price, all regions.	4 percent of the border price, all regions.		
Source	<	Gonzales et a	l., 1993	>		
Domestic Price (farmgate or other)	Producer price of Paddy "sawah" irrigated rice.	Producer price.	Producer price.	Retail price of refined sugar.		
Sources	Indonesia Statistics, (1998, 2002) and USDA-FAS (2003b).	Indonesia Statistics, (1998, 2002) and USDA-FAS (2003a)	Indonesia Statistics, (1998, 2002) and USDA-FAS (2003b)	Data files from ADB/SEARCA/IFPRI/C RESCENT (2004), and USDA-FAS (2003c)		

# Table 4.2—Empirical components of NPR estimates: definitions and sources for import crops

	Import crops			
Category	Rice	Maize	Soybeans	Sugar
Internal Costs Adjustments for Domestic Output (MM) <sup>2</sup>	The MM costs average 33 percent of the producer price milled equivalent.	The MM costs are 15 percent in Java and off Java of the producer price.	The MM costs are 20 percent in Java and 22 percent off Java of the producer price for soybeans.	Price already at retail market. No adjustment.
Source	Authors calculations <sup>2</sup>	Gonzales et al., (1993)	Gonzales et al., (1993)	
Quality and Process Level Adjustments Source	Farmgate price of paddy is divided by the recovery factor, 0.62, to obtain a milled rice price equivalent. <i>IRRI</i> , (2003)	No adjustment.	No adjustment.	No adjustment.
Regional Coverage (The regional measures are averaged across regions using the share of the regional production in total production as weights)	West Java, Central Java, East Java, West Sumatera, Rest of Sumatera, South Sulawesi, Rest of Sulawesi, and Rest of Indonesia.	Java and off Java.	Java and off Java.	Java and off Java.

#### Table 4.2—Empirical components of NPR estimates: definitions and sources for import crops---continued

Notes: <sup>1</sup>Rice: For 1985 the world price is the monthly average for the year of Thai 5% parboiled; and for 2003 the world price is monthly average for the year of f.o.b. Thai broken 5% and Thai broken 15% (BULOG, 2003). For 2001 to 2003 the domestic prices at the regional level were not available and have been estimated using indices of rice prices received by farmers (Bank of Indonesia, various years).
 <sup>2</sup> These margins are computed as a fixed percentage of the farmgate price. For rice, the rates are authors' estimates based on observed national wholesale prices and consultation with Dave Dawe from IRRI. For the other crops the rates are derived from the 1986 values for these margins in Gonzales et al. (1993). Estimates of the international freight rates may be on the high side, overestimating the landed price of rice and therefore underestimating the protection. (Other authors have used a flat rate of \$US10-20/mt and FAO estimated the freight rates in South Asia to be around \$US25-30 in the 1990s).
	Export Crops								
Category	Crude Palm Oil (1991-2003)	Natural Rubber (1985-2002)							
Trade status	Exportable	Exportable							
Reference domestic market	Wholesale	Wholesale							
<ul><li>Border Price</li><li>World price</li><li>Sources</li></ul>	F.o.b., export unit value of crude palm oil (CPO) <i>FAOSTAT (2004) and USDA-FAS</i> <i>(2003b)</i>	F.o.b., export unit value of natural rubber FAOSTAT (2004)							
• International freight	N/A	N/A							
• Exchange rate Sources	Monthly average for each year. <bank (2002)<="" indonesia="" of="" td=""><td colspan="5">Monthly average for each year. and USDA-FAS (2004a)&gt;</td></bank>	Monthly average for each year. and USDA-FAS (2004a)>							
Internal Cost Adjustments for exporters (TC: Port charges, handling, Transport from wholesale market to port) <sup>1</sup>	4 percent of the border price	4 percent of the border price							
Source	<gonzales (1993)<sup="" al.="" et="">2</gonzales>								
Domestic Price (farmgate or other)	Producer price of CPO	Wholesale price of natural rubber in							
Sources	FAOSTAT (2004) and USDA-FAS (2003b)	<i>Statistics Indonesia (1998, 2002)</i> and FAOSTAT (2004)							
Internal Costs Adjustments for	5 percent of the producer price	No adjustment.							
Source	Donald F. Larson (1996)								
Regional Coverage	Country level	Country level							

# Table 4.3—Empirical components of NPR estimates: definitions and sources for export crops

Sources: Authors' calculations. Notes: <sup>1</sup> These margins are computed as a fixed share of the corresponding price. <sup>2</sup> The rates are the same as those for sugar in Gonzales et al. (1993).

#### 5. NPR ESTIMATES FOR INDONESIA

## 5.1 IMPORT CROPS (RICE, MAIZE, SOYBEANS, AND SUGAR)

#### Rice (1985-2003)

Indonesia is the world's third largest producer of rice and the largest importer. Rice is the main staple and continues to be at the center of Indonesia food policies. It is grown by small-scale subsistence farmers and accounts for 65 percent of harvested area (Bahri, Kustiari, and Wittwer, 2000). Nearly 80 percent of rice is grown on irrigated lands, making it the heaviest aggregate user of water (Barichello, 2003).

In the decade from 1975 to 1985, the government promoted rice through a combination of output price support and input subsidies, and production increased by about seven percent annually on average. Rice self-sufficiency was attained in the mid 1980s, an impressive achievement considering that Indonesia was the world's largest net importer of rice only five years earlier (Bautista et al., 1997). In the second half of the 1990s, unexpected shortages made large imports necessary to keep prices below a ceiling level. During the period 1998-1999 large imports reflected decreased production in part from the drought brought on by El Niño. Self-sufficiency for rice increased from 82.2 percent in 1998 to 95.4 percent in 2001.

Prior to the financial crisis, the Suharto government stabilized domestic prices of rice by a combination of a price band (guaranteed floor price for producers and a ceiling price for consumers) and a monopoly on international trade by the state owned agency, BULOG. The prices were defended through BULOG's control over international trade and the management of stocks. BULOG would purchase domestic rice to prevent the price from falling below the floor price, and release stocks or import rice to keep the price below the ceiling. In addition, the government promoted production through the development of new rice varieties, which required investment in irrigation and subsidized fertilizers. The combination of stable prices and new technology succeeded in achieving

the goal of self-sufficiency. The program was successful in promoting the rice sector and oil revenues supported the large costs associated with it. BULOG was successful in stabilizing domestic prices, but kept them in trend with world prices overall (Timmer, 2002). Consequently, private traders felt confident about their activities (marketing margins were wide enough to allow them a profit) and they could complement and simplify BULOG's operations (BAPPENAS/USAID/DAI, 2002c; Barichello, 2003). BULOG's procurements averaged around 10 percent of domestic production, the rest is mostly consumed directly by farmers' households or marketed by private traders.

Reforms undertaken in 1998 were largely part of the IMF structural adjustment program with the exception of rice. Because of corruption in BULOG, the Government decided unilaterally to eliminate BULOG's import monopoly for rice as well and open the domestic and trade markets for rice (Magiera, 2003).. In 1998, rice trade was liberalized and trade was entrusted to private traders. Control was returned to BULOG when private traders were unable to maintain the floor price (Wailes, 2003). In January 2000, a rice tariff of Rp 430/kg (about 30 percent) became effective. In spite of the removal of BULOG's import monopoly, the state-owned enterprise can still be authorized by the GOI to restrict import when domestic prices fall below a certain threshold or to prevent a rice glut (WTO, 2003b). In January 13, 2004, Oryza (2004) reported that BULOGs delayed "400,000 metric tons of rice imports from Thailand and Vietnam from January to August to help local farmers ... the delay is aimed at preventing the price of rice in the domestic market from falling below 1,725 rupiah (US\$1=Rp8,327) a kilogram." Although, its role has changed BULOG continues to provide support to rice producers, stabilize prices though domestic procurement, and distribute rice to the poor.

Figure 5.1 shows the results of nominal protection rates for rice computed for the period 1985-2003. At the beginning of the period, protection is high reflecting the continued efforts from the early 1980s of government to promote rice production in order to attain self-sufficiency. During the following period, 1987 to 1997, the pattern is consistent with the policy of stabilization. The nominal rates are mostly positive (between

4 and 26 percent) except in the late 1980s when world rice prices surge (negative NPRs of 8 and 11 percent). By the 1990s, domestic prices keep in trend with world prices overshooting slightly (see movement of the world and domestic prices in Figure 5.2). The devaluation in 1998 explains negative protection of –44 percent. Although domestic prices were raised in 1998, the border price of rice (c.i.f.) increased by even more due to the depreciation (Barichello, 2003). When compared to Barichello's NPRs, the estimates herein show similar movements for the overlapping years (Appendix Figure A.1).

According to Wailes (2003) the non-tariff barriers resulted in a much higher tariff rate equivalent (75 percent) than the 30 percent due to the import duties. The non-tariff barriers include customs regulations like the use of the red lane or channel, which requires imported goods to undergo physical examination and a check of their declared value (WTO, 2003b), and the newly created special import number for certain commodities (NPIK) (BAPPENAS/USAID/DAI, 2002b). When comparing the actual retail price in Jakarta to the import parity price of Indian 15% broken rice, BAPPENAS/USAID/DAI (2002b) estimates the protection equivalent to 98.5 percent in Jan-May 2002. In our analysis, the NPRs for the period 2001-2003, ranging from 25 to 58 percent are more consistent with the 30 percent tariff. Still, it reflects the suspicion borne in the literature that the protection for rice has slipped higher than reflected in the import tariff (Figure 5.1; Table 5.1). And the current political pressure is for this protection to go up (Timmer, 2002; Barichello, 2003).

## *Maize (1985-2003)*

Although maize is increasingly used in cattle-feed (it constitutes 50 percent of the animal-feed components), 80 percent of production is for human consumption. The main producing regions are Java and Sumatera, with 60 and 20 percent of total production, respectively in 2003 (USDA-FAS, 2003a).

In 1989, BULOG ceased to exert monopoly control over maize imports and over inter-island and inter-provincial marketing (Bahri, Kustiari and Wittwer, 2000). By 1990

the government discontinued the setting of the floor price for maize (initiated in 1978). Bautista et al. (1998) observed that the support price had proved to be redundant as the producer price was consistently higher than the floor price. Maize, like other agricultural commodities, benefited from input subsidies, implemented to encourage the use of improved technology, before being gradually reduced, due to budgetary considerations, and removed in 1999. In trade policy, the main instrument was an import tariff of 10 percent on maize imports until 1994 when it was reduced to 5 percent (USDA-FAS, 1995a), and eventually removed in 1995 (Bahri, Kustiari and Wittwer, 2000).

The market support measures for maize show positive protection during the mid-1980s while under BULOG's control. The continued positive NPRs ranging from 4 to 25 percent in the mid-1990s is somewhat puzzling given the absence of any direct government policy regarding maize. Notwithstanding the usual caveats associated with computing indicators of support, the results may reflect the effects of non-tariff barriers such as import licensing schemes.<sup>16</sup> After dropping to -38 percent, due to the devaluation, the NPR estimates for maize indicate positive protection at slightly lower levels than the first half of the 1990s (Figures 5.3 and 5.4; Table 5.1).

## Soybeans (1985-2003)

Indonesia is the world's ninth largest producer and importer of soybeans (Mattson, Sun, and Koo, 2004). Production has been declining (45 percent from 1990-92 to 2000-02) mostly due to a decline in harvested area of (52 percent during the same period). Prior to 1995/96, 10-12 percent of soybeans produced domestically were used for feed. With the only soybeans crushing plant closed, domestic production is almost entirely used for human consumption (in the form of tofu and *Tempe*) while whole soybeans and soybean meal are imported (Douvalis, 1999).

<sup>&</sup>lt;sup>16</sup> When interviewing traders in the mid-1990s, Steve Magiera found ad-hoc evidence that excessive port costs added 5 to 10 percent to the price of imported maize when compared with neighboring countries. In our study, these costs are not included in the landed cost of imported maize, but if they were they would reduce the calculated NPR for maize.

In 1986, the GOI included soybeans among the commodities (along with rice and sugar) subject to policies aimed at self-sufficiency through the implementation of intensification programs. Import control through BULOG's monopoly on imports and distribution insulated the domestic price of soybeans from the world market (Bahri, Kustiari, and Wittwer, 2000). From the late 1980s until 1996, these monopoly rights were passed on to a private soybeans crushing firm.<sup>17</sup> During that period, imports were brought and sold in the domestic market at a fixed price to KOPTI (manufacturer cooperatives) above import rates and to local traders at higher "market" prices: an incentive to producers and higher profits for BULOG and later to the sole crushing firm (Douvalis, 1999).

Indonesia continues to be a net importer of soybeans. In 1995 soybean trade was deregulated (except for yellow soybeans), the import tariff was reduced from 10 to 5 percent, and the value added tax (VAT) was removed (USDA-FAS, 1995b). The tariff on soybeans was removed as part of the 1998 reforms following the financial crisis (Barichello, 2003).

The decreasing nominal protection rates after 1995 (except for the 1999 rebound following the devaluation) reflects these reforms (Figure 5.5). Given the elimination of government interventions in the soybean market, the NPR is expected to continue to decline, with the domestic price following movement in the world price (Figure 5.6; Table 5.1) unless pressure to introduce a new tariff prevails. USDA-FAS (2004a) reports that the GOI is discussing the possibility of an import duty for soybeans of 30 percent while the Ministry of Agriculture is planning to subsidize prices of seeds and fertilizer for soybean production (USDA-FAS, 2004a).

#### Sugar (1985-2003)

Until the late 1980s, smallholder farmers accounted for almost 80 percent of cane production, the result of GOI's sugarcane intensification program (Rusastra, Suprihatini,

<sup>&</sup>lt;sup>17</sup> Although BULOG retained control.

and Iqbal, 1999), but this proportion has decreased to 55 percent. The remaining share is split evenly between national and private large-scale plantations (USDA-FAS, 2004b). The two major producing areas are Java, which accounts for around 63 percent (a decreased from 75 percent in 1995) and Lampung (Sumatera), which accounts for 29 percent of total production. In Java, where the share of sugar production in irrigated land has decreased, sugar has to compete with other alternative crops especially rice, which has had higher returns (Rusastra, Suprihatini, and Iqbal, 1999).

The majority of the 59 sugar mills are state owned enterprises (52), which produce 68 percent of Indonesia's sugar production (USDA-FAS, 2004b). In spite of the government's efforts to develop domestic production, imports continue to be substantial and the self-sufficiency index dropped from 0.85 in 1970 to 0.63 in 1997 (Rusastra, Suprihatini, and Iqbal, 1999). Smallholder farmers continue to face outdated techniques in production, high input prices, and despite programs like KKP, little access to credit making it hard to compete with world sugar markets (USDA-FAS, 2004b).

Sugar was heavily protected prior to the 1998 reforms in an attempt to reach selfsufficiency as with rice. In the early 1970s BULOG was given the role of stabilizing prices and distributing sugar. In 1981, BULOG was given monopoly on sugar imports and domestic procurement (Rusastra, Suprihatini, and Iqbal, 1999). The government set the price structure for sugar, which consisted of a *provenue* (manufactured primary price) and ex-factory price. The farmer shared with the mills the set price: farmers received 62 to 70 percent of the sugar extraction value of the cane and the mills received the remaining share (USDA-FAS, 1995c).

Starting in 1997 the government issued a series of deregulation packages (partly self-initiated but also in concordance with its IMF commitment), which removed BULOG's monopoly control and allowed all traders to import sugar and market it domestically; released farmers from the formal and informal requirements for planting of sugar cane; and removed all consumer price subsidies by 1998. In spite of these reforms, BULOG effectively maintained its full monopoly over sugar imports (due to exclusive

access to a subsidized exchange rate) and distribution until the end of 1998 when its monopoly control over sugar was eliminated (USDA-FAS, 1998).

Import licensing (to sugar millers) continued until 2000 when it was replaced by 20 and 25 percent tariffs for raw and refined sugar, respectively. In 2002 the GOI started restricting imports of raw and refined sugar for processing to three state sugarmills. Registered importers could only import semi-refined sugar when farmgate prices of local sugar are higher than Rp. 3,100/kg (a "breakeven point" for domestic producers). The government also notified the WTO of new standards for raw sugar to be applied to local and imported sugar and import ad-valerum tariffs were replaced by specific import duties of Rp. 550/kg for raw sugar and Rp. 700/kg for white sugar (Haley and Suarez, 2003).

The values of protection, estimated by the NPR in Figure 5.7, are consistent with the mix of sugar policies from the GOI during this period. The NPR series compares the import unit value of imported sugar, which is mostly refined and of better quality than the domestically produced sugar, with the wholesale price in Jakarta of domestically produced sugar, which is an average price of refined and centrifugal raw sugar. So the NPR is computed ex-factory and expresses the subsidies to the millers and farmers jointly. Rising world sugar prices in the late 1980s, meant that producers were disprotected because they faced a fixed domestic price (Figure 5.8).

Price incentives to increase sugar production resulted in high protection, between 21 and 74 percent in the 1990s, except during 1997 due to the Rupiah devaluation (Figures 5.7 and 5.8; Table 5.1). Imports continued to be heavy due to poor performance by Indonesia sugar industry and falling world prices (Haley and Suarez, 2003). The official import figures do not include illegal imports estimated in 2003/2004 to be as high as 500,000 metric tons, a third of total imports. The rising trend in protection illustrates the import restrictions established after 2002 and the high breakeven point for sugar production relative to falling world prices (USDA-FAS, 2004b).

#### 5.2 EXPORT CROPS (CRUDE PALM OIL AND NATURAL RUBBER)

## Crude Palm Oil (1991-2003)

Crude palm oil (CPO) world production and exports are dominated by Malaysia and Indonesia. Indonesia is the second largest producer (34 percent of the world total production), exporter (28 percent of world exports), and consumer (14 percent of world consumption) of CPO (Mattson, Sun, and Koo, 2004).

The oil palm subsector in Indonesia expanded consistently from the late 1960s until 1997. Most of the growth came from the large privately owned estates and smallholders production, with less growth from state owned estates production (Figure 5.9). In the mid 1980s, smallholders were producing 7 percent of total production while state owned estates and privately owned estates produced 65 and 27 percent, respectively. But by the late 1990s, the share of smallholders production rose to 24 percent, that of privately owned estates to 43 percent and government owned decreased to 33 percent (Hasan, Reed, and Marchant, 2001). Production has also expanded outside of Sumatera, which still accounts for more than 90 percent of total oil palm production, into Kalimantan.

The GOI, set on achieving first place in world palm oil production by 2003, contributed to the growth of the private sector output by providing credit subsidies to private developers from the mid-1980s. The area planted increased by five fold from 600,000 hectares in 1985 to 3 million hectares in 1999 (van Gelder, 2001). This served also the smallholders, who benefited since the late 1970s from the PIR/NES scheme (Nucleus Estate and Smallholder scheme) and subsequent programs: PIR-Trans (1986-1994) and the KKPA (1995-1995). Under the PIR/NES scheme, private developers prepared plots of land, which they would transfer to smallholders upon maturity (3 to 4 years). Still the large-scale private sector dominates the industry, owning more than 51 percent of the area planted (Casson, 2000).

In 1991, the GOI removed all trade restrictions on palm oil products, which had been regulated since 1978 (export tax and domestic price control). The trade liberalization policies resulted in an increase in Indonesia export shares of palm oil in the world market from 1.6 percent in 1984 to 13 percent in 1991 and 23 percent in 1997; and in a sharp increase in the retail price of palm cooking oil.<sup>18</sup> The rise in price induced the government to implement an export tax on palm oil products in August 1994 (Marks, Larson, and Pomeroy, 1998; Hasan, Reed, and Marchant, 2001), and to maintain through BULOG a permanent buffer stock (USDA-FAS, 1997). The export tax rate schedule for crude palm oil and its products depended on a domestic target price (specified in dollars per metric tons) and was applied only if the f.o.b.export price was above the target price. Between September 1994 and December 1995, the average export tax was 11.36 percent and 14.45 percent of the export price for crude palm oil and palm cooking oil, respectively. When the world prices for these products came down after January 1996, the respective tax rates were 6.39 and 6.73 (Marks, Larson, and Pomeroy, 1998).

Between January 1998 and August 1999, the GOI implemented a series of policy changes, starting with a three-month ban on exports of crude palm oil (CPO) and its products. The ban was replaced by an export tax rate of 40 percent, increasing to 60 percent in July 1998, and back to 40 percent in January 1999, decreasing to 30 and 10 percent by the end of 1999 (Casson, 2000: Appendix 5). By 2000 the export tax rate was set at 5 percent in view of Malaysia's decision to eliminate its CPO duty, and India, the major importer, to raise taxes on edible oil imports (USDA-FAS, 2000). The current rate is 3 percent, but in spite of abundant supplies, Indonesia is experiencing lower level carry-over stock in 2003 because both exports and domestic utilization have increased. This situation may induce the GOI to increase both the target price and the export tax (USDA-FAS, 2003b).

<sup>&</sup>lt;sup>18</sup> Palm oil is an important source of Indonesian cooking oil replacing coconut oil as the prominent edible oil consumed in Indonesia (Hasan, Reed, and Marchant, 2001). Indonesia domestic consumption reaches above 50 percent of its CPO production, compared with Malaysia, which consumes 10 percent of its production.

GOI's policies on palm oil and its products have been consistent with its concerns to provide sufficient raw material for domestic processing industries and to maintain low prices for consumers of palm oil based cooking oil. Indonesia's palm oil sector is very efficient and the country is acquiring sufficient CPO factories to process the production of palm fruit (USDA-FAS, 2003b). Consequently, the sector is very profitable on the international and domestic markets (Voituriez, 2001).

Figure 5.1 shows NPRs for CPO for the years 1991 to 2003. Before the crisis, policies seemed to have been aimed at stabilizing domestic prices.<sup>19</sup> The removal of trade restrictions in 1991 allowed domestic prices to rise as exports increased causing shortages in the domestic supply. In 1994, the export tax schedule was introduced maintaining the domestic price in line with the f.o.b. price and reducing exports for the next two years, resulting in an NPR varying between -10 and 11 percent. The negative NPR of nearly -50 percent in 1998 reflects the devaluation of the rupiah, which pushes world prices up in domestic currency. GOI's interventions between 1997 and the end of 1998 succeeded in increasing domestic prices but they remained well below the international US dollar price (Figure 5.11; Table 5.1; Voituriez, 2001). The NPR becomes positive in 1999 and starts to increase. One explanation for this positive protection in spite of export taxes is the nature of the Indonesian oil market, which is controlled by a few large private companies with political connections. Comparing the Malaysian and Indonesian markets, Voituriez (2001) notes: "... the Indonesian domestic market has a strongly integrated distribution chain, is burdened with an oligopoly in oil processing and selling and suffers from an absolute lack of transparency in price setting." As the export tax rate continues to decrease (3 percent in 2003), domestic prices follow the movement in international prices, which start climbing (Figure 5.11).

<sup>&</sup>lt;sup>19</sup> Producer prices prior to 1991 were not available from the FAOSTAT data base, but between 1985 and 1991, CPO domestic prices were fixed by the GOI, ranging between Rp 400/kg and Rp 570/kg (Voituriez, 2001).

#### Natural Rubber (1985-2002)

Indonesia accounts for 23 percent of the world's rubber production and 28 percent of world exports (2000-2002 average) making it the world's second largest producer and exporter of rubber after Thailand (FAOSTAT, 2004). Indonesia has 3.4 million hectares of rubber plantation, with a total output of 1.6 million tons, of which 1.4 million tons are exported (Laksamana.net, 2001).

Smallholder rubber covers 83 percent of the total Indonesian rubber area (2.4 hectares harvested area) and contributes more than 75 percent of the total rubber production in Indonesia. The smallholder's dominant share in production accounts for Indonesia having the lowest cost production in the range of US\$ 0.86 per kg against 0.95 to 1.06 in other countries (1995). But "jungle rubber" does not provide a good income for rubber farmers and rubber estates have gradually been converted to oil palm plantations, which have become much more profitable (Budiman, 1996).<sup>20</sup>

In the 1980s and 1990s, the GOI encouraged the development of "clonal" rubber plantations which contrary to the traditional system depend much more on high-level inputs (fertilizers, pesticides and herbicides). The GOI provided packages of credit and cultivation technology to change the smallholder rubber system. The new system, which affects only 15 percent of smallholder producers, has been hard to sustain due to the requirement of capital, credit, available planting material and technical information, especially following the disengagement of the GOI from the rubber sector in 1999 (Penot and Trouillard, 2002).

At the end of 2001, responding to a 30-year low price and weak demand, the world's top three natural rubber producers, Thailand, Indonesia and Malaysia, agreed to a number of cooperative measures in an effort to increase prices under the formation of a consortium, the International Tripartite Rubber Company (ITRCo). These measures

<sup>&</sup>lt;sup>20</sup> Jungle rubber, a dominant rubber cultivation system in Indonesia, "… begins with forest clearing and burning and both rice and rubber are planted. Rice is harvested for two years, and the plot is then left to revert to forest. After about eight years, a rubber-rich secondary forest results." (Chomitz and Griffts, 1996).

included agreed export volume limits and a supply management scheme aimed at cutting back annual production by 4 percent in 2002 and 2003. From February 2002, Indonesia has allocated annual export quotas of 1.23 million tonnes, as part of the plan to reduce exports by 10 percent. The export quotas apply when the international price of rubber falls below an agreed reference price, which is not publicly released. Quotas are allocated to exporters by the industry on the basis of previous export sales. According to authorities, Indonesia has not applied the quota since mid 2002 when the world price rose above reference levels (WTO, 2003b).

Prior to 1997 NPRs show that domestic rubber prices have moved with world prices (Figures 5.12 and 5.13). The closeness between the two prices results from Indonesia being a major producer and exporter of rubber, in close proximity with the two other largest producers and exporters. The rubber sector shows the effects of the 1997/98 financial crisis earlier than the other crops. A quick rebound was due to a surge in domestic prices while international prices continued to decline, overshadowing the effects of the devaluation (Figure 5.13). Following the decline in world prices, which precipitated the ITRCo agreement, there has been a sharp increase in world prices matched by rising domestic prices.



Figure 5.1—Milled rice: net exports and NPR (1985-2003)

Sources: Authors' calculations (see Table 4.2 for details).

500 450 400 350

Figure 5.2—Milled rice: world and domestic prices (1985-2003)



Source: Authors' calculations (see Table 4.2 for details).



Figure 5.3—Maize: net exports and NPR (1985-2003)

Source: Authors' calculations (see Table 4.2 for details).

Figure 5.4—Maize: world and domestic prices (1985-2003)



Authors' calculations (see Table 4.2 for details).

Source:

Figure 5.5—Soybeans: net exports and NPR (1985-2003)



Source: Authors' calculations (see Table 4.2 for details).





Source: Authors' calculations (see Table 4.2 for details).



Figure 5.7—Sugar: net exports and NPR (1985-2003)

Source: Authors' calculations (see Table 4.2 for details).

Figure 5.8—Sugar: world and domestic prices (1987-2003)



Source: Authors' calculations (see Table 4.2 for details).



Figure 5.9—Production structure by owner type for CPO (1985-2001)

Source: Authors' calculations based on data in Casson (2000).



Figure 5.10—CPO: net exports (1985-2003) and NPR (1991-2003)

Source: Authors' calculations (see Table 4.3 for details).



Figure 5.11—CPO: world (1985-2003) and domestic prices (1991-2003)

Source: Authors' calculations (see Table 4.3 for details).



Figure 5.12—Natural rubber: net exports and NPR (1985-2002)

Source: Authors' calculations (see Table 4.3 for details).



Figure 5.13—Natural rubber: world (1985-2003) and domestic prices (1985-2002)

Source: Authors' calculations (see Table 4.3 for details).

						Natural
	Rice	Maize	Soybeans	Sugar	CPO	rubber
1985	42	-6	86			-5
1986	44	21	117			-18
1987	2	27	95	13		6
1988	-8	-2	58	-24		-3
1989	-11	-3	39	-36		0
1990	6	4	80	-31		-3
1991	4	13	84	-7	11	-4
1992	14	7	80	65	35	-3
1993	22	16	89	51	44	0
1994	26	25	81	21	25	10
1995	16	20	84	37	-10	5
1996	11	-2	70	50	11	1
1997	12	12	50	-18	-1	-43
1998	-44	-38	-9	11	-49	21
1999	19	11	62	67	3	18
2000	26	12	50	7	5	-11
2001	25	16	47	14	23	6
2002	55	11	16	36	12	8
2003	58	17	6	100	17	

 Table 5.1—Nominal protection rates for PSE Commodities (1985-2003)

Source: Authors' calculations (see Tables 4.2 and 4.3 for details).

#### 6. PSE ESTIMATES FOR INDONESIA

In this section, MPSs and PSEs are evaluated for the six agricultural commodities and aggregate PSEs are estimated. PSEs include both price support and budgetary payments but in developing countries, due to fewer fiscal revenues, often the budgetary component of the PSE is empirically not as important as in developed countries and arises primarily from government subsidies in the input sector. The MPS for Indonesia are measured based on the prices defined and used in the NPR calculations and the budgetary payments, irrigation and fertilizer subsidies, are estimated from development expenditures data (ADB/SEARCA/IFPRI/CRESCENT, 2004: Appendix Table 5.1).

#### 6.1 PSE METHODOLOGY

The OECD defines the PSE as a measure of the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers that results from government domestic and trade policies. It is characterized as a nominal protection indicator, which measures the nominal assistance and does not take into account the protection of tradable inputs (OECD, 1999 and 2002).

The PSE includes two components:

- A market price support (MPS), which is a commodity specific measure and
- The sum of government budgetary payments to agricultural producers, which may include commodity specific as well as non-commodity specific transfers.

The MPS assesses effects of government policies which isolate agricultural producers from movements in world prices or exchange rate variations, or which otherwise create a gap between the world and domestic price. Like the more traditional measure of support, the Nominal Protection Coefficient (NPC), the MPS measures the gap between the price agricultural producers received for their production (producer price) and the one they would have received (reference price) in the absence of government interventions (border measures such as tariff or import licensing, domestic price support, procurement and distribution monopolies by state-owned enterprises, and subsidized exports). In the case of the MPS, the price wedge is multiplied by production to assess the income effect on producers.

As in the case of nominal protection, the choice of the border price depends on the trade status of the commodity (c.i.f. prices for imports and f.o.b. prices for exports). Once identified, the border price must also be adjusted to make it comparable to the domestic equivalent, in terms of location, quality, and process level. OECD measures the PSE at the farmgate level so the reference price must be adjusted accordingly.

In the notation of equation 1, the MPS and PSE for a specific commodity can be expressed in monetary terms:

$$MPS = \left(P_p - P_{ar}\right) \times Q \tag{5}$$

$$PSE = MPS + BP \tag{6}$$

where:

Q : production

*BP* : budgetary payments to producers of the commodity.

This result can also be expressed as percentage PSE, which reflects the share of gross farm receipts derived from policies:

$$\% PSE = \frac{PSE}{Q \cdot P_P + BP} \times 100 \tag{7}$$

PSEs are aggregated across all commodities covered (representing the bulk of a country's agricultural trade) to give a single indicator of support for the country (see Mullen et al., 2004 for full discussion of the PSE measurement).

#### 6.2 BUDGETARY PAYMENTS: INPUT SUBSIDIES

Fertilizer subsidies have been used to assist mainly rice and sugar farmers, in order to promote self-sufficiency. The GOI provided cheaper fertilizer to farmers, mostly smallholders, while large estates users did not benefit from the subsidy. The subsidies, which were only applied to nitrogenous fertilizers (urea), were successful in increasing fertilizer usage from 676 thousand tons in 1975 to 4,290 thousand tons in 1998 at an estimated cost of Rp2,257 billions in 1997/1998 (ADB/SEARCA/IFPRI/CRESCENT, 2004: Tables 7.6 and 7.7). The subsidies had been implemented since the 1970s, and put a heavy burden on the government budgets, estimated at 40 percent of the agriculture and irrigation development budget (Fuglie, 2001 and 2003).

Fertilizers subsidies were eliminated in 1997, but reintroduced for food crops the same year, and removed again in December 1998. In 2001 the direct subsidy to fertilizer was replaced by requiring the state-owned petroleum company to provide subsidized gas to the state-owned urea fertilizer manufacturers. The gas subsidy was eliminated in 2002. In 2003, the direct subsidy was reintroduced and applied to specific fertilizers. The GOI pays the subsidy to the state-owned fertilizer manufacturers, which pass it on to farmers through lower prices. The goal is to reduce the urea price to small-scale farmers of rice (as well as horticulture) 15 to 20 percent (ADB/SEARCA/IFPRI/CRESCENT, 2004: Chapter 7). Because the subsidies do not apply to imported fertilizer and benefit only small farmers, it creates a dual pricing structure and opportunities for abuse and leakage (Ringler, Rodgers, and Rosegrant, 2003).

In the PSE calculations, the fertilizer subsidy by crop is estimated from the GOI development budget. Rice is allocated 70 percent of the subsidies and the remainder is allocated to the PSE commodities according to their share in total crop production. The available data series is interrupted for 2000-2002, but the budgetary cost of the subsidy

for 2003 was estimated to be Rp1,315 billion (Ross, 1990; Ringler, Rodgers, and Rosegrant, 2003).<sup>21</sup>

To estimate the irrigation subsidies, it is assumed that 85 percent of irrigation expenditures from the government budget are subsidies and that 80 percent of this subsidy is allotted to rice (Ross, 1990). The remaining estimated subsidy is allocated to the PSE commodities according to their share in total crop production

The relative size of fertilizer and irrigation subsidies has changed over the period 1985-2000. While in the mid-1980s, fertilizers subsidies accounted for nearly two third of the total, its relative share dropped in the 1990s to below 10 percent before being eliminated completely in 2000. On the other hand irrigation subsidies have been increasing in absolute and relative terms particularly during the mid-1990s (Fuglie and Piggot, 2003: Table 5).

In addition to fertilizers and irrigation subsidies, farmers have benefited increasingly from subsidized farm credit: the coverage of crops eligible has increased as well as the ceiling of allocated credit funds (from Rp150 billion in 1997 to Rp3,500 billion in 1998 and Rp6,500 billion in 1999). The interest rate of farm credit, 10.5 percent, is also much lower than current market interest rates of 30 percent (Bahri, Kustiari, and Wittwer, 2000), The credit subsidy is not included here because of lack of access to a consistent time series data for the period covered, an omission which underestimates the budgetary payments component of the PSE and therefore the PSEs.

## 6.3 NOMINAL PSE CALCULATIONS

To compute the commodity-specific PSEs for Indonesia, we follow the OECD basic methodology, taking into account some of the alternative measures discussed in Mullen et al. (2004).

<sup>&</sup>lt;sup>21</sup> The budgeted figure is usually different for the realized expenditure, and may overestimate the actual subsidy.

The border and domestic price estimates used in the MPS are identical to those used to compute the NPRs. Commodities are either assumed to be importable (rice, maize, soybeans, and sugar) or exportable (palm oil and rubber) based on their net trade patterns. For the imported commodities the MPS calculations are carried out at the state level and then aggregated to give a national value (see Table 4.2 for details). The regional price data was not available for export commodities and so in that case, only the national calculations apply. The budgetary payments are the sum of the fertilizer and irrigation subsidies discussed in the previous section.

A commodity-specific PSE can be expressed in monetary value per unit of output aggregated for the total production of the specific commodity or as a percentage of the income the farmer receives with respect to that commodity. This last measure, as reported by OECD, calculates income the farmer receives based on the value of production at domestic prices plus budget payments (Equation 7). We also compute an alternative (the "trade economist's") approach, which expresses the farmer's income as the value of production at reference (farmgate-equivalent international) prices:

$$\% PSE^* = \frac{PSE}{Q \cdot P_{ar}} \times 100$$
(8)

This last indicator is very close to the corresponding NPR, which is also computed relative to the reference price, but the numerator now includes the budgetary payments.

The total PSE for the country expressed in nominal terms is the sum of the aggregate MPS (for all agriculture) and the total budgetary payments. Following Mullen et al. (2004), we present two ways of computing the aggregate MPS.

The first way to estimate the aggregate PSE is to assume that the MPS of noncovered commodities is zero, and the aggregate MPS is the sum of commodity-specific MPS for the covered commodities (rice, maize, soybeans, sugar, crude palm oil, and natural rubber), labeled MPS<sub>c</sub>.

$$MPS_c = \sum MPS_j \tag{9}$$

$$PSE_c = MPS_c + BP \tag{10}$$

where:

j : covered commodities

BP : total budgetary payments to producers

The second way to estimate the aggregate PSE is to assume that the MPS of noncovered commodities is equal to the weighted average of  $MPS_c$ , and the aggregate MPS is a "scale-up" value of  $MPS_c$ , based on the share of the covered commodities in the total value of production.

$$MPS = \frac{MPS_c}{k} \tag{11}$$

$$PSE = MPS + BP \tag{12}$$

where:

*k* : share of the covered commodities in the total value of production

This second method is the one used by OECD. For each of these procedures, we apply the OECD and "trade economist's" approaches to the denominator.

#### Commodity-Specific PSEs

Commodities-specific results are summarized in Figures 6.1 and 6.2, which show the %PSE (OECD denominator) for imported and exported commodities, respectively. As expected, the commodity %PSE figures reflect closely the results from the NPRs, but augmented by the budgetary transfers. With the exception of the late 1980s (for rice and sugar) and 1997/98 crisis (for all crops), import commodities have been protected. While support for maize and soybeans shows a declining trend, support for rice and sugar, is rising (Figure 6.1; Appendix Tables A.1a-d).

Results for exported commodities show that palm oil has been protected except for 1995 (implementation of the export tax structure) and 1998 (devaluation of the rupiah). Rubber shows little protection or disprotection because the domestic price movements are consistent with movements in the world prices, which can be influenced by Indonesia's production and trade activities combined with that of its large producing neighbors, Thailand and Malaysia (Figure 6.2; Appendix Tables A.1e-f).

For some commodities results can vary across regions. In 1985, support for rice was twice as high in the off-Java regions (Sumatera and Sulawesi) than in Java where more than half the rice is produced, but in 1998, with the devaluation effect, the same regions were disprotected at a much higher rate than Java. In 2003, rice producers in the Rest of Sulawesi were disprotected while protection increased in the rest of the country (Table 6.1). Regional variability also makes a difference for maize in Java, where producers benefited from more support in the late 1980s and early 1990s but the pattern switched in the second half of the 1990s. The results for the last three years (2001-2003) indicate much less variability accross the two regions (Figure 6.3).

## The Aggregate PSE Measures

Aggregate PSE results clearly show that Indonesia has been subsidizing its agriculture somewhat, especially since the 1990s (Figure 6.4). The level of protection has a counter-cyclical component, with disprotection when world prices are relatively high (as in the late 1980s and mid 1990s) and protection when world prices are lower. The effects of the devaluation of the Rupiah during the financial crisis (1997/1998) is also evident. The domestic value of international prices jumped to very high level, and domestic prices followed with a lag. The Rupiah stabilized at a higher level and the gap

between domestic and international prices returned to pre-crisis levels. The last three years show an increasing trend in protection.

The aggregate PSEs show that the MPS estimates are the dominant component of the PSE. This is especially noticeable in the last five years when the MPS estimates are positive and account between 91 and 98 percent of the PSE. The share of the value of production shows that the six PSE commodities capture more than two-thirds of the total agriculture (Table 6.2).<sup>22</sup>

Table 6.2 and Figure 6.4 show the results of "scaling-up" in calculating the PSE (see Equations 7 and 8). On this basis, PSE is larger in magnitude than  $PSE_c$ , except when  $MSP_c$  is very small relative to BP (1990-1991 and 1997), rendering the values almost equal.

The results shown for %PSE in Figure 6.4 utilize the standard OECD denominator (production valued at domestic prices plus budget payments). Results using values of production at reference prices (trade economist's denominator) are also shown in Table 6.2. The "trade economist" %PSE values indicate higher protection (or less disprotection) than the OECD %PSE values.

<sup>&</sup>lt;sup>22</sup> This share may be somewhat inflated because production for the PSE commodities is valued at wholesale prices and sometimes retail prices (depending on the domestic prices used in the comparison) while the total value of agricultural production is valued at producer prices (FAOSTAT, 2003).

Figure 6.1—Percent PSE for imported commodities (1985-2003)



Source: Authors' calculations

Figure 6.2—Percent PSE for exported commodities (1985-2003)



Source: Authors' calculations

Figure 6.3—Regional estimates of maize %MPS (1985-2003)



Source: Authors' calculations.



Figure 6.4—Estimates of Indonesia %PSE (1985-2003)

Source: Authors' calculations.

	West	Central	East	West	Rest of	South	Rest of	Rest of		
	Java	Java	Java	Sumatera	Sumatera	Sulawesi	Sulawesi	Indonesia		
1985	20	36	30	75	61	40	74	36		
1986	39	52	44	70	47	2	38	11		
1987	-2	10	6	13	0	-22	-4	-23		
1988	-12	0	-7	14	-9	-32	-16	-31		
1989	-16	-8	-14	8	-3	-28	-42	-30		
1990	2	8	1	20	18	-16	-1	-21		
1991	0	6	0	24	20	-24	-8	-24		
1992	8	15	10	37	23	-11	7	-11		
1993	14	18	17	35	36	2	42	-7		
1994	23	31	26	21	28	5	45	-7		
1995	14	21	13	25	14	-2	34	-6		
1996	7	16	7	15	6	7	-6	-5		
1997	8	14	12	23	6	7	-9	-7		
1998	-43	-42	-44	-51	-51	-44	-56	-48		
1999	18	12	18	-9	11	20	29	13		
2000	18	15	19	35	31	9	41	23		
2001	21	16	20	23	30	2	45	18		
2002	57	62	75	16	35	19	24	34		
2003	62	60	49	18	49	44	10	59		

 Table 6.1—Regional estimates of rice %MPS (1985-2003)

Source: Authors' calculations.

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
	Rp billion																		
Measured Support																			
MPSc	2867	3313	1109	-1353	-2545	1125	1786	5314	7145	8410	6846	6001	2774	-68755	22375	19968	27004	48254	52773
BP	1126	891	669	1078	649	705	925	1115	1107	1221	2246	1880	2151	2776	6131	2933	1813	1298	1315
Covered Share	0.60	0.55	0.55	0.63	0.64	0.65	0.71	0.74	0.73	0.82	0.93	0.95	0.81	0.46	0.72	0.59	0.57	0.75	0.78
MPS	4789	6033	2010	-2132	-3965	1727	2515	7226	9837	10206	7392	6293	3425	-150588	30867	33847	47441	64320	67585
PSE																			
PSEc	3993	4205	1778	-274	-1895	1830	2711	6429	8253	9631	9092	7881	4925	-65979	28506	22901	28817	49552	54088
PSE	5915	6924	2679	-1054	-3315	2432	3439	8340	10945	11427	9637	8173	5576	-147812	36998	36780	49254	65618	68900
Exchange Rate (Rp/US\$)	1115	1283	1643	1717	1787	1882	1982	2051	2095	2160	2239	2348	2953	9875	7809	8527	10266	9261	8560
Nominal PSE (US\$ million)	5305	5397	1631	-614	-1855	1292	1735	4067	5224	5290	4304	3481	1888	-14968	4738	4313	4798	7085	8049
										percent									
%PSE																			
Trade Economist Denominator																			
PSEc	28.8	25.3	6.5	-0.8	-4.8	4.9	6.9	16.4	21.4	24.0	18.2	14.8	7.2	-16.9	17.7	12.6	13.6	28.3	34.7
PSE	42.7	41.6	9.8	-3.1	-8.4	6.5	8.8	21.2	28.4	28.4	19.3	15.3	8.2	-37.9	23.0	20.2	23.3	37.4	44.2
OECD Denominator																			
PSEc	20.2	17.9	5.9	-0.8	-5.3	4.6	6.4	13.5	16.7	18.7	15.3	12.8	6.7	-27.2	14.4	10.5	11.0	20.6	24.1
PSE	29.9	29.4	8.9	-3.1	-9.2	6.1	8.1	17.5	22.1	22.1	16.2	13.3	7.5	-61.0	18.7	16.8	18.9	27.2	30.7

## Table 6.2—Indonesia total PSEs (1985-2003)

Source: Authors' calculations

Note: MPS<sub>C</sub> refers to PSE commodities only; MPS refers to total agriculture

#### 7. SUMMARY AND CONCLUSION

We have estimated indicators of support (NPRs and PSEs) for Indonesia's agriculture based on the conventional OECD methodology, and using variants based on alternative adjustments and assumptions (Mullen et al., 2004). The quantitative results have been analyzed in the context of Indonesia's economic structure and its international trade and agriculture policies from 1985 to 2003.

Indonesia's economy, during President Suharto's regime (1968-1998), grew at an impressive rate. The progress in economic development was attributed to stable macroeconomic policies coupled with considerable investments in human resources (especially public health and education) and rural development. Agriculture, benefiting from green revolution technologies and injections of resources from the management of oil export revenues, has been important in the Indonesian economy, especially as an income generator for the poor. Growth in agriculture has been rapid but uneven, resulting from agricultural and trade policies dominated by the government's goals to achieve self-sufficiency in various food commodities and to provide its light manufacturing sector with adequate and affordable supplies of primary agricultural inputs.

The Asian financial crisis (1997/1998) interrupted Indonesia's growth path, although the economy has since recovered, albeit at a lower rate than prior to the crisis. The GOI's policy objectives for agriculture are still responding to old concerns of achieving self-sufficiency, especially in rice and sugar, but they now compete with new concerns including poverty alleviations, decentralization and diversification of the agricultural sector toward higher value crops, and increasing exports of value-added processed agricultural products.

The GOI intervenes in production, marketing and trade of agricultural products employing a set of complicated agricultural price, procurement, distribution, storage, and input subsidy policies. The government has also utilized many trade policy instruments,

such as import tariffs, quantitative restrictions, import and export licensing, and interregional marketing restrictions. The state-owned enterprise, BULOG, in spite of its diminished role, continues to be instrumental in implementing these policies of the major food crops, especially rice.

The reform process, which started in the mid-1980s, has been unilateral, as well as in response to commitments under the WTO and the agreement with the IMF following the financial crisis. The major agricultural reforms have been the tariffication of quantitative trade restrictions for agricultural products, the elimination of input subsidies, and the removal of BULOG's monopoly on import and distribution. The reform process has been marked with occasional policy reversals and setbacks and some of the policies remain obscured.

The support measures computed in this study are an attempt in quantifying the net effects of these policies. The NPR and PSEs computed for Indonesia show that in spite of the reforms, the GOI has subsidized its agriculture over the past twenty years, although not uniformly across commodities. The pattern of protection has been much more consistent since the 1990s, interrupted only by the 1997/1998 financial crisis. Following the crisis, subsidies reverted to their pre-crisis level and even increased for some commodities. On average, the %PSE for the country more than doubled between 1986-1988 (11.7 percent) and 2001-2003 (26 percent).

The results presented in this study must be interpreted with the usual caution associated with the estimation of support indicators in general and the PSEs in particular due to the assumptions and judgments made when computing their various components. In the study, the choice of transportations costs and marketing margins may have underestimated or overestimated the value of these activities, inflating or deflating the value of support accruing to producers. The choice of markets to compare international and domestic prices, in spite of the attention given to the differences in processing and accounting for marketing costs, may raise the issue of whom is actually benefiting from the support, the farmer, the miller, or the trader. The process of "scaling-up" the PSE

values to all of agriculture without examining the policies affecting the non-covered commodities, underlines the necessity for a more comprehensive study, which would include other agricultural sectors, for example the livestock sector.

Nevertheless, a reasonable assessment of support for agriculture in Indonesia over the period 1985-2003 emerges from the analysis presented. Observers of Indonesia have noted the slow down in productivity starting in the mid 1990s in agriculture in general and in food and non food crops in particular (Fuglie, 2003: Table 1). For commodities like rice and sugar, for which our results show increased protection in the past five years, productivity and farmer income prospect have not been very good.<sup>23</sup> It is beyond the scope of this study to assess the effects of agriculture protection in Indonesia on agricultural growth and productivity but the mixed evidence of productivity slow down with increased level of support suggests that protection has not contributed to growth in a positive way.

<sup>&</sup>lt;sup>23</sup> The authors thank an anonymous reviewer of this paper for highlighting these observations.

## APPENDIX

# Figure A.1—Comparing NPRs of imported commodities from various authors

a. Rice

b. Maize



c. Soybeans

d. Sugar



Sources: Gonzales et al. (1993); Barichello (2003); authors' calculations.
a. Rice																			
Rice	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
									R	p billion									
MPS	2800	3054	260	-1327	-2169	1053	822	2647	4002	5370	4782	3549	4137	-52112	15140	17836	18278	40683	41280
Budgetary Payments	828	665	489	787	500	537	713	862	868	950	1715	1490	1702	2166	4694	2346	1450	1038	921
Nominal PSE	3628	3719	749	-540	-1670	1590	1535	3509	4871	6320	6497	5038	5839	-49946	19834	20182	19729	41721	42201
	percent																		
%PSE																			
Trade Economist Denominator	55.0	52.9	6.6	-3.3	-8.7	8.9	7.6	17.8	26.1	29.9	22.2	15.4	16.6	-41.9	25.0	29.2	27.3	55.8	59.2
OECD Denominator	35.5	34.6	6.2	-3.4	-9.5	8.1	7.1	15.1	20.7	23.0	18.1	13.4	14.2	-72.1	20.0	22.6	21.4	35.8	37.2
Difference	19.5	18.3	0.4	0.1	0.8	0.7	0.5	2.7	5.4	6.9	4.0	2.1	2.4	30.2	5.0	6.6	5.8	20.0	22.0

# Table A.1—Indonesia's commodity PSEs (1985-2003)

## b. Maize

Maize	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
_									Rj	p billion									
MPS	-46	177	222	-38	-45	62	223	157	278	515	599	-106	498	-5095	965	1129	1825	1326	2110
Budgetary Payments	18	17	11	22	10	12	14	19	14	16	37	30	34	52	109	45	26	18	31
Nominal PSE	-28	194	233	-16	-35	74	237	176	292	531	636	-76	532	-5044	1074	1174	1851	1344	2141
	percent																		
%PSE																			
Trade Economist Denominator	-4.0	22.3	28.0	-1.0	-2.2	4.1	13.7	7.9	16.2	25.5	21.4	-1.6	13.4	-37.9	12.7	12.4	16.6	11.6	16.8
OECD Denominator	-4.2	18.3	21.8	-1.0	-2.2	4.0	12.0	7.3	14.0	20.3	17.6	-1.6	11.8	-60.9	11.3	11.0	14.3	10.4	14.4
Difference	0.2	4.1	6.1	0.0	0.0	0.2	1.6	0.6	2.3	5.2	3.8	0.0	1.6	23.1	1.4	1.4	2.4	1.2	2.4

## Table A.1Continued

# c. Soybeans

Soybeans	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
-									Rj	p billion									
MPS	157	263	421	392	315	640	747	866	917	872	986	879	710	-356	1646	980	876	228	102
Budgetary Payments	4	3	3	4	2	3	3	5	4	4	7	5	5	7	16	5	2	1	2
Nominal PSE	161	266	424	396	317	643	750	871	920	876	993	884	716	-350	1662	984	878	229	104
	percent																		
%PSE																			
Trade Economist Denominator	87.6	118.7	95.9	58.2	39.0	80.6	84.6	80.4	89.7	80.9	84.4	70.0	50.6	-9.0	63.1	50.4	46.7	15.9	6.4
OECD Denominator	46.7	54.3	48.9	36.8	28.1	44.6	45.8	44.6	47.3	44.7	45.8	41.2	33.6	-9.8	38.7	33.5	31.8	13.8	6.0
Difference	40.9	64.5	46.9	21.4	10.9	36.0	38.8	35.9	42.4	36.2	38.6	28.8	17.0	0.9	24.4	16.9	14.8	2.2	0.4

# d. Sugar

Sugar	19	85 1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
									R	p billion									
MPS	n.a.	n.a.	106	-314	-647	-581	-97	961	913	463	789	1017	-487	392	2894	337	908	1719	3972
Budgetary Payments	n.a.	n.a.	57	91	45	51	62	77	72	79	129	95	107	142	279	112	71	49	74
Nominal PSE	n.a.	n.a.	163	-223	-602	-530	-35	1038	985	542	918	1112	-380	534	3173	448	978	1768	4046
	percent																		
%PSE																			
Trade Economist Denominator	n.a.	n.a.	19.9	-17.0	-33.8	-28.4	-2.5	69.6	54.7	24.7	42.9	54.2	-14.1	15.0	73.2	9.4	14.9	36.8	101.3
OECD Denominator	n.a.	n.a.	16.6	-20.4	-51.0	-39.7	-2.5	41.0	35.3	19.8	30.0	35.1	-16.4	13.0	42.3	8.6	13.0	26.9	50.3
Difference	n.a.	n.a.	3.3	3.5	17.2	11.3	0.1	28.5	19.3	4.9	12.9	19.0	2.3	2.0	30.9	0.8	1.9	9.9	51.0

### Table A.1Continued

# e. Crude Palm Oil

Crude Palm Oil (CPO)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
-									R	p billion									
MPS	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	166	755	1030	884	-538	603	-59	-13673	485	663	4561	3478	5309
Budgetary Payments	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	27	32	37	48	99	79	104	150	389	170	107	84	133
Nominal PSE	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	193	787	1067	932	-438	682	45	-13524	874	833	4668	3562	5442
	percent																		
%PSE																			
Trade Economist Denominator	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	12.7	36.3	45.1	26.2	-7.7	12.4	0.6	-48.0	5.8	6.2	23.4	12.3	17.0
OECD Denominator	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	11.3	26.7	31.1	20.8	-8.4	11.0	0.6	-92.2	5.5	5.9	18.9	11.0	14.5
Difference	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.4	9.7	14.0	5.4	0.7	1.4	0.0	44.2	0.3	0.4	4.4	1.4	2.5

## f. Natural Rubber

Natural Rubber	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
-									R	p billion									
MPS	-44	-180	99	-66	1	-50	-74	-72	6	306	229	59	-2025	2089	1246	-975	557	821	n.a.
Budgetary Payments	4	3	2	4	2	2	3	3	3	4	7	5	6	8	19	8	5	3	5
Nominal PSE	-40	-177	102	-62	3	-48	-71	-69	9	309	236	64	-2019	2097	1265	-967	561	824	n.a.
	percent																		
%PSE																			
Trade Economist Denominator	-4.9	-17.4	6.5	-2.9	0.2	-2.6	-3.6	-3.0	0.4	10.0	4.8	1.4	-43.2	21.1	18.5	-11.4	6.6	8.2	n.a.
OECD Denominator	-5.2	-21.1	6.1	-3.0	0.2	-2.7	-3.7	-3.1	0.4	9.1	4.6	1.3	-76.1	17.4	15.6	-12.9	6.1	7.6	n.a.
Difference	0.3	3.7	0.4	0.1	0.0	0.1	0.1	0.1	0.0	0.9	0.2	0.0	32.9	3.7	2.9	1.5	0.4	0.6	n.a.

Source: Authors' calculations.

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