

THE COSTS OF SQUEEZING MARKETING MARGINS: PHILIPPINE GOVERNMENT INTERVENTION IN RICE MARKETS

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Local governments frequently buy and sell food grains in local markets to alter domestic food prices. Because of a desire to provide both high prices to producers and low prices to consumers, official floor and ceiling prices are often set without regard to marketing costs.¹ When the difference between official ceiling and floor prices is less than the private trade's costs of transportation, processing, and storage, a marketing subsidy is necessary. Yet governments often set official prices as if unaware of this additional intervention cost.

This article examines Philippine government intervention in domestic rice markets in order to demonstrate the importance of marketing costs for design of effective market intervention. The difference between official floor and ceiling prices in the Philippines has not usually covered the costs of marketing, particularly storage. Because of an unwillingness to displace private trade, intervention has not always been sufficient to keep market prices equal to official prices. The goal of this article is to measure the effects of this inadequate market intervention and to estimate the potential costs of successful intervention. An anticipatory price model, similar to ones developed by Goldman [4] and Bouis [3], is used to estimate the determinants of the seasonal price increase.² The model developed here is designed to capture the impact of government market activities on average returns to private storage. Before considering intervention policy in the Philippines, the determinants of price margins are reviewed.

I. A MODEL OF PRICES, MARGINS, AND GOVERNMENT INTERVENTION

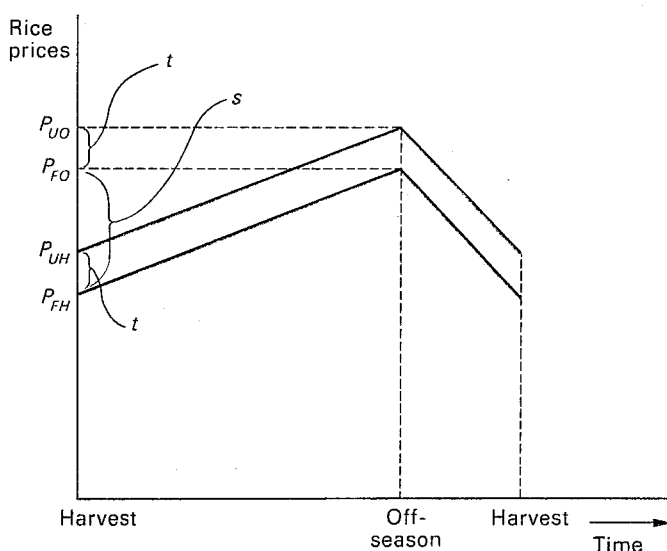
All domestic prices are directly or indirectly affected by total supply, but mar-

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¹ For example, see Mears [5, pp. 408-10] and Tolley et al. [10, p. 16].

² Bouis [3] demonstrated that uncertainty about the timing of imports caused unusual rice price fluctuations in the Philippines from 1961 to 1972. The tendency of government stockholding to reduce returns to private traders is the focus of this article.

Fig. 1. Spatial and Temporal Components of the Margin between Farm and Consumer Price



Note: Adapted from Timmer [9].

keting costs separate prices in different locations and months. In general, the minimum market price is the harvest season farm price and the maximum is the off-season consumer price. The total margin between these two prices is influenced by processing, transportation, and storage costs. The government defines its intervention role as placing limits on these two domestic prices through defense of official farm-gate floor prices and official urban consumer ceiling prices.³

Figure 1 illustrates the normal price pattern for an annual crop in the absence of government intervention. Farm-gate prices are lowest during the harvest season, P_{FH} , and rise gradually to P_{FO} in the off-season. In a competitive market with no uncertainty, stocks are carried between seasons up to the point where $P_{FO} - P_{FH}$ just equals storage costs, s . Urban consumer prices, P_{UH} , are equal to farm prices plus the cost (t) of processing and transportation from producing areas to the urban market.⁴ Urban prices follow the rise in farm prices due to storage costs and equal P_{UO} in the off-season. The total private margin $M_M = P_{UO} - P_{FH}$ is equal to the sum of storage and transportation costs ($s + t$).

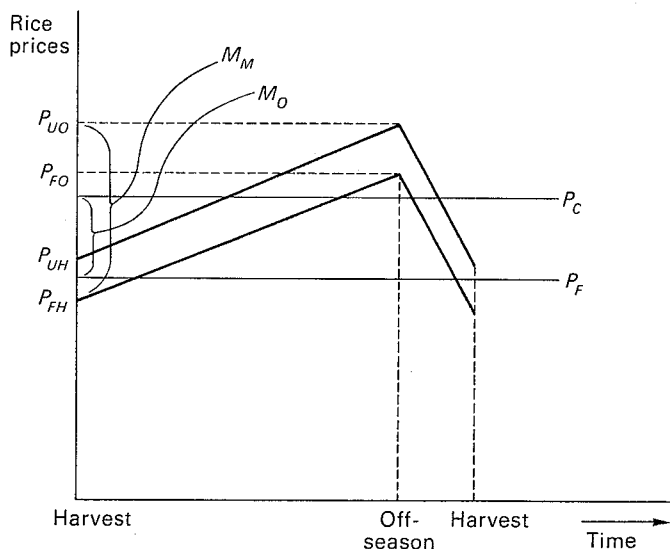
Government market intervention can limit domestic price fluctuations through purchases and sales in defense of official floor and ceiling prices.⁵ When the difference between the official prices $M_O = P_C - P_F$ (the official margin) is not large enough to cover all the private costs of trade (Figure 2), then the govern-

³ This article does not consider how the government monopoly on international trade affects total domestic supply, as domestic prices have generally followed world price levels.

⁴ Figures 1 and 2 assume a fixed volume and hence constant marketing costs. This assumption is relaxed in Figures 3 and 4.

⁵ In the Philippines, official prices are the same throughout the country.

Fig. 2. Official Floor and Ceiling Prices Set to Reduce the Margin between Farm and Consumer Prices



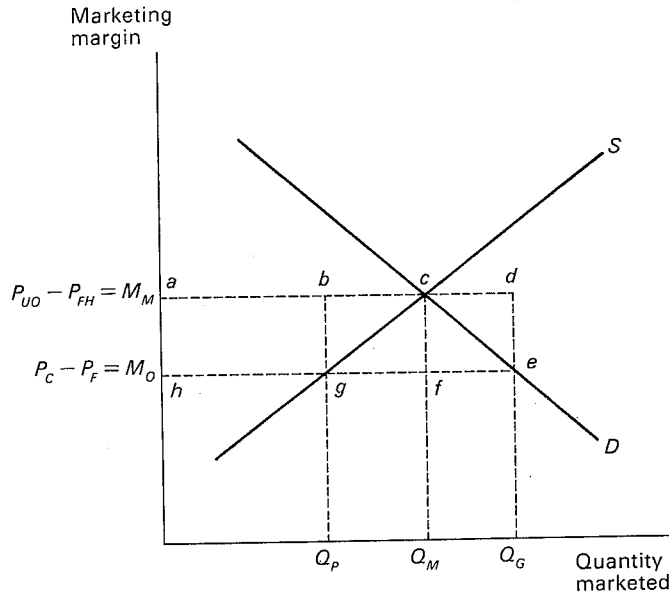
ment must incur a per unit loss on its market activities equal to the difference between M_M and M_O . When P_C is less than P_{FO} , there will be off-season government sales at a loss in both regional and urban markets, and the seasonal price increase ($P_{FO} - P_{FH}$) will decline.

Seasonal price increases ($P_{FO} - P_{FH}$) equal storage costs only when there is perfect information about future supplies. Storage decisions are based on expectations about total annual supply, but actual supply may vary from expected supply. Stocks and prices can only adjust to unexpected changes in supply as the extent of the shortfall or surplus becomes known. For example, if the dry season harvest is less than expected, off-season prices will increase above P_{FO} to allocate the reduced supply until the next main harvest (Goldman [4, pp. 102-3]). Or if the dry season harvest is large, prices will fall as the market absorbs the extra supply. Seasonal price increases therefore vary in individual years but should be equal to average storage costs over many years.

Changes in stocks carried from year to year can offset the impact of uncertainty on the seasonal price rise (Peck and Baumes [7, pp. 12-13]). Fewer stocks will be carried out at the end of the year if there is an unexpected shortfall in supply within the year. Thus adjustments in year-end stocks will reduce seasonal price fluctuations due to unexpected changes in supply.

The government can reduce the average seasonal price increase ($P_{FO} - P_{FH}$) by carrying stocks within the year at a loss. In addition, the government can offset seasonal price fluctuations due to unexpected changes in supply through changes in government stocks carried between years. For example, the government can reduce year-end carry-out when there are shortfalls in supply. Inappropriate changes in government stocks due to bad planning, however, can add to

Fig. 3. Government Intervention to Reduce the Marketing Margin



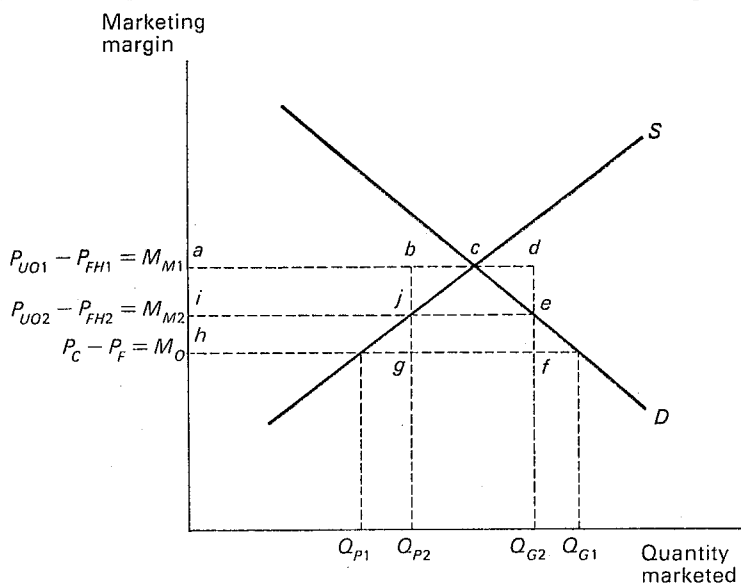
unexpected changes in supply and exacerbate seasonal price fluctuations.

Government market intervention to reduce M_M will redistribute income between traders and food producers and consumers. The effect of intervention is illustrated in Figure 3 where S and D represent the supply of and demand for marketing services. The "consumers" of these services are both the producers and consumers of rice while the "producers" are private traders. Without intervention, the "price" of marketing services is M_M . If the government wishes to enforce a smaller margin, M_O , then it must purchase, transport, store, and sell the additional quantity $Q_G - Q_M$ offered by producers and demanded by consumers. Because the returns to trading activities decline, private trade is only willing to market Q_P and the government must also handle $Q_M - Q_P$. The government markets additional quantities and also replaces some portion of the private trade as less efficient trading firms withdraw from marketing.

Private traders lose the producer surplus associated with trading $Q_M - Q_P$ ($acgh$), while producers and consumers of rice gain the consumer surplus ($aceh$) from the additional marketing services. The government loss equals $bdeg$, if the government is assumed to have constant marketing costs. The principal cost reflected in M_M is the cost of capital used in storage activities. This cost will vary widely for private traders but it is reasonable to assume that the social opportunity cost of capital used in government marketing activities is constant.

When the government is not willing or able to assume a large enough proportion of domestic trade to enforce the narrow official margin, actual prices will diverge from official prices. Any government purchase or sale will have some impact on price, however, even if inadequate to hold official prices. For example, if

Fig. 4. Inadequate Government Intervention to Reduce the Marketing Margin



government purchases are only $Q_{G2} - Q_{P2}$, the margin is $M_{M2} = P_{UO2} - P_{FH2}$ (Figure 4). Government intervention is not large enough to reduce the margin to M_0 but the actual margin is smaller than it would have been without intervention. All producers and consumers of rice gain from this reduction in the margin ($acei$). Total government costs are the area $bdfg$ because government purchases and sales are at official prices. Actual market prices are not equal to official prices because intervention is inadequate, and hence purchases or sales at official prices are rationed.

In summary, when the official margin is smaller than private marketing costs, the government marketing agency must replace some portion of private trade and operate at a loss. Similarly, the government can reduce unusual seasonal price fluctuations by taking a loss on stock changes between years. Any intervention will reduce the total margin, but when the government is not willing or able to market enough quantity to defend official prices, actual market prices will diverge from official prices. When intervention is inadequate to defend official prices, then opportunities to sell or buy at official prices will be rationed.

II. PHILIPPINE RICE PRODUCTION AND RICE MARKET INTERVENTION, 1962 TO 1981

Philippine rice production doubled from 2.5 to 5 million tons between 1965 and 1980. During the 1960s, the 2.8 per cent annual growth in production lagged behind a 3.0 per cent growth in population, and supply remained about 5 per cent less than consumption (Apiraksirikul [1]). In the late 1960s farmers began adopting modern varieties, and in the early 1970s the government increased investments in irrigation. These changes resulted in an average annual 5 per

TABLE I
RICE PRODUCTION, INTERNATIONAL TRADE, AND GOVERNMENT MARKET
INTERVENTION IN THE PHILIPPINES

(1,000 metric tons milled rice)

Crop Year	Production	Net Imports	Procurement	Disbursements
1962/63	2,578.6	256.2(9.9)	156.5(6.1)	366.0(14.2)
1963/64	2,497.9	299.9(12.0)	26.4(1.1)	311.6(12.5)
1964/65	2,596.4	569.2(21.9)	2.1(0.1)	402.3(15.5)
1965/66	2,647.2	108.2(4.1)	22.9(0.9)	252.9(9.6)
1966/67	2,661.1	238.6(9.0)	56.1(2.1)	150.4(5.7)
1967/68	2,964.5	-40.3(-1.4)	151.6(5.1)	29.6(1.0)
1968/69	2,889.1	-0.5(-0.0)	145.3(5.0)	169.0(5.8)
1969/70	3,401.7	* *	50.1(1.5)	60.1(1.8)
1970/71	3,472.9	369.3(10.6)	2.1(0.1)	108.7(3.1)
1971/72	3,315.1	440.1(13.3)	0.4(0.0)	541.3(16.3)
1972/73	2,869.5	308.1(10.7)	4.8(0.2)	252.2(8.8)
1973/74	3,636.2	169.3(4.7)	22.0(0.6)	189.8(5.2)
1974/75	3,679.0	145.3(3.9)	95.9(2.6)	238.2(6.5)
1975/76	4,003.7	55.2(1.4)	163.9(4.1)	259.1(6.5)
1976/77	4,196.5	15.6(0.4)	273.9(6.5)	198.8(4.7)
1977/78	4,481.7	-13.4(-0.3)	451.5(10.1)	136.7(3.1)
1978/79	4,678.1	-38.0(-0.8)	423.1(9.0)	74.7(1.6)
1979/80	5,093.4	-236.0(-4.6)	403.1(7.9)	268.2(5.3)
1980/81	5,020.0	-175.0(-3.5)	280.5(5.6)	255.1(5.1)

Sources: Production data are from Ministry of Agriculture, Philippines. Net Imports, procurements, and disbursements data are from NFA.

Note: Figures in parentheses indicate percentages of production.

* Quantity less than 1,000 tons.

cent growth in production from 1975 to 1981 while population growth slowed to 2.7 per cent annually. There were small but sustained export surpluses from 1977 to 1982 (Table I).

The importance of different price policy instruments has changed with the growth in production. During the 1960s the Rice and Corn Administration (RCA) played a fairly minor role in domestic marketing, usually procuring less than 2 per cent of production. Government market intervention primarily took the form of disbursement of imports in consuming centers. The RCA was replaced by the National Grain Authority in 1972, and renamed the National Food Authority (NFA) in 1981. As part of renewed concern about farmer incentives, the agency was given additional funds in order to play a more active role in domestic marketing. The NFA increased procurements, purchasing at least 5 per cent of the larger production from 1977 to 1981. Intervention activities were also spread more evenly throughout the Philippines. Procurements in the main producing region of Central Luzon were one-third of the national total between 1973/74 and 1975/76, but declined to one-fifth in the late 1970s, about the same proportion as the region's contribution to national supply. Disbursements in Manila declined from half of total government sales in 1973/74 to one-quarter in 1979/80. With growing domestic supplies in the 1970s, the principal tasks

TABLE II
AVERAGE OFFICIAL FLOOR AND CEILING PRICES FOR RICE IN THE
PHILIPPINES, 1962/63 TO 1980/81

Crop Year	Paddy Floor Price (P/Kg)	Rice Ceiling Price (P/Kg)	Difference between Official Prices ^a (P/Kg Rice)
1962/63	0.26	0.36	0.04
1963/64	0.28	0.34	-0.09
1964/65	0.28	0.46	0.03
1965/66	0.28	0.55	0.12
1966/67	0.38	0.59	0.01
1967/68	0.38	0.59	0.01
1968/69	0.38	0.59	0.01
1969/70	0.38	0.59	0.01
1970/71	0.41	0.59	-0.04
1971/72	0.54	1.07	0.24
1972/73	0.66	1.33	0.32
1973/74	0.81	1.86	0.61
1974/75	1.00	1.90	0.36
1975/76	1.06	2.02	0.39
1976/77	1.10	2.10	0.41
1977/78	1.10	2.10	0.41
1978/79	1.25	2.36	0.44
1979/80	1.36	2.51	0.42
1980/81	1.51	2.75	0.43

Sources: Apiraksirikul [1]; Mears et al. [6]; and data from NFA.

^a Rice ceiling—paddy support/65.

of NFA became the disposal of surplus production through exports and increased government stock holding.

The government had a monopoly on foreign trade of rice from 1962 to 1981, but domestic rice prices generally followed the trend in world prices. The average ratio of domestic to world prices for 1960 to 1980 is close to 1.00. Domestic prices were above world prices in the 1960s because of the difficulties of obtaining funds to import (Bouis [2, pp. 58–61]). In the late 1970s domestic prices were slightly below world prices because export markets were limited due to the low quality of domestic rice by world market standards (Unnevehr [11, pp. 14–16]). Thus both RCA and NFA appear to have traded slightly smaller quantities on the world market than the private trade would have.

RCA and NFA apparently followed different policies in setting the margin between official floor and ceiling prices. During the years of RCA administration from 1963 to 1971, the difference between the ceiling price and the floor price corrected for milling losses, was very small and sometimes negative (Table II). This small official margin was unlikely to have ever covered the costs of transportation between producing and consuming areas, and was certainly too small to cover costs of storage.

The NFA considers milling and transportation costs explicitly when setting official prices, and thus average annual official margins have been larger in the

TABLE III
 RETURNS TO STORAGE IN CENTRAL LUZON ALLOWED BY OFFICIAL FLOOR
 AND CEILING PRICES, 1972/73 TO 1980/81

Crop Year	Nov.-Jan. Floor Price in Rice Equivalent ^a (P/Kg) (1)	Aug.-Oct. Ceiling Price Minus Transport (P/Kg) (2)	Ceiling Price Deflator ^b (3)	Real Percent Increase in Official Prices ^c (4)
1972/73	0.83	1.26	1.25	21.4
1973/74	1.08	1.70	1.10	43.2
1974/75	1.43	1.68	0.99	18.7
1975/76	1.54	1.86	1.15	5.1
1976/77	1.69	1.85	1.01	8.4
1977/78	1.69	1.83	1.00	8.3
1978/79	1.69	2.17	0.96	33.5
1979/80	2.00	2.30	1.12	2.4
1980/81	2.23	2.53	1.16	-2.4

Sources: Ceiling and floor prices from NFA. Transport, handling, and milling costs from Central Luzon to Manila are from Mears et al. [6] and NFA.

^a Floor price divided by 0.65.

^b Ratio of long-run trend in August to long-run trend in November. Long-run trend is estimated by a twelve-month centered moving average of Central Luzon wholesale prices (see footnote 7 for further explanation).

^c [(2)/(3) - (1)]/(1).

1970s. The cost of eight to ten months of storage between main harvests, however, is not considered. A 26 per cent real increase in official prices would cover the normal private cost of storage.⁶ Table III presents the estimated returns to storage in Central Luzon allowed by official prices in the 1970s. Transportation costs and milling losses are subtracted from official prices and ceiling prices are deflated.⁷ The real per cent increase in the adjusted official prices has been ade-

⁶ The principal costs of storage are product losses and the cost of working capital tied up in stocks. Losses in storage of paddy, mostly from shrinkage, range from 5 to 10 per cent over a six-month period. The unregulated annual interest rates on long-term bank loans were 21 to 25 per cent in 1982, and this is the cost of working capital. A 26.1 per cent increase in prices would just cover the costs of eight months storage with 10 per cent losses and 21 per cent annual interest on working capital.

⁷ Inflation in rice prices increases the amount of working capital needed to store a fixed quantity. Increases in the level of official prices to follow the inflation in rice prices do not provide any returns to traders. The ceiling price is deflated by the same measure of trend used to calculate the seasonal price increase. If the seasonal price increase is normally estimated by,

$$SI = (P_A/CMA_A - P_N/CMA_N) / (P_N/CMA_N) = [P_A / (CMA_A/CMA_N) - P_N] / P_N,$$

where P = price,

CMA = twelve-month centered moving average,

A, N refer to August, November,

then,

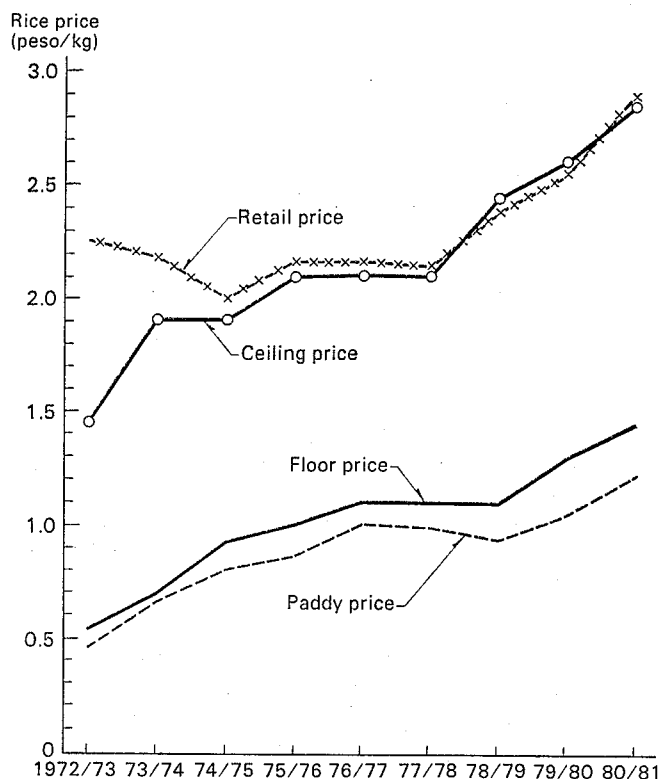
$$SIO = [P_C / (CMA_A/CMA_N) - P_F] / P_F,$$

where SIO = seasonal increase in official prices,

P_C = ceiling price minus transportation costs,

P_F = floor price in rice equivalent.

Fig. 5. Official Floor and Ceiling Prices, Retail Rice Prices, and Wholesale Paddy Prices, 1972/73 to 1980/81



quate to cover private storage costs in only two years, 1973/74 and 1978/79.

The marketing costs used here are low estimates and represent only costs between Manila and a nearby wholesale market. Costs from the farm-gate to the wholesale market or from more remote regions have not been included. Because the official floor price is the same throughout the Philippines, the difference between the official margin and private costs is likely to be much higher than indicated in Table III.

III. THE EFFECT OF GOVERNMENT INTERVENTION ON PRICE MARGINS

Comparisons of retail rice prices in the off-season (August) to official ceiling prices and paddy prices during harvest (December) to official floor prices indicate that NFA has generally been unsuccessful in defending the narrow official margin (Figure 5). Between 1973 and 1981 there has been no year in which both actual producer and consumer prices have been within the official price bounds. Retail rice prices in August were above the ceiling from 1973 to 1978. Retail prices were highest and varied most widely among regions in 1973, indicating the difficulty of supplying outlying markets in that year of large imports. By 1979 the

TABLE IV
CENTRAL LUZON FARMERS REASONS FOR NET SELLING PADDY
TO NFA, 1981/82

	(% of responses)
Reason:	
Quality restrictions at NFA	24
Payment difficult to get	19
Price better elsewhere	11
Priority given to large farmers	11
Do not have NFA passbook	10
Too much time required at NFA	7
Transportation expensive	9
Obliged to private trader	3
Other ^a	6
Total	100

Source: Survey of seventy-two Central Luzon farmers regarding sales of paddy in 1981/82.

Note: An open-ended question about reasons for not selling to NFA was asked of the sixty-two farmers who sold to private traders. Several farmers gave more than one reason.

^a Reasons such as NFA not buying at harvest time, must be a cooperative member to sell to NFA, and no knowledge of NFA price.

growing domestic supply led to off-season retail prices below the ceiling price. Farm-gate prices in December, the main harvest month in most regions, show a similar downward trend relative to the floor price, but were consistently below the floor price in all years.

Inadequate intervention in defense of paddy floor prices implies that opportunities to sell at the official floor price have been rationed. Rationing is accomplished by a number of requirements that restrict sales to NFA. Farmers who sell to NFA must hold passbooks issued by provincial NFA offices. The passbook entitles legally recognized operators of rice farms to sell a certain amount per hectare to NFA. Rice in excess of this amount or rice produced by illegal tenants cannot be sold to the government agency. Rice of poor quality should be accepted at a lower price, but is often refused entirely. Furthermore, NFA pays by checks that can be cashed only at certain banks.

Results of a survey of seventy-two Central Luzon farmers regarding sales in 1981/82 indicate the importance of these restrictions in reducing the incentive to sell to NFA. Only 14 per cent of these farmers sold to NFA, and the amount sold was 9 per cent of sales volume in the total sample. Farmers who sold to NFA were paid by check and obtained cash three to four days after sale. They received a significantly higher price of 9 per cent more than those who sold to private traders. Those who did not sell to NFA indicated that quality restrictions and the difficulty of getting cash payment were the principal reasons for their choice (Table IV). Very few farmers were deterred from selling to NFA by lack of information or obligations to a private trader. Administrative requirements

and the refusal of NFA to buy average quality paddy limit farmers' sales at the official price.⁸

While injections of rice into the retail market are triggered by price, purchases of palay (unhusked rice) at the floor price are only available to some producers. Government market intervention is designed to be more responsive to consumer price increases above the ceiling than to decline of producer prices below the floor. As domestic supply has been abundant since 1978 the government has been able to maintain retail prices below the official ceiling. When the government has been unable to enforce the narrow official margin, producer prices have fallen below the floor in the harvest season.

Even though government intervention has not been large enough to maintain floor prices, intervention should have reduced the seasonal fluctuations in producer prices ($P_{FO} - P_{FH}$). Without government intervention, seasonal price increases are a function of marketing costs and deviations of actual supply from expected supply,

$$SI = a + b(Q - Q^*),$$

where

SI = the annual seasonal price increase,

Q = actual production,

Q^* = expected production.

The constant, a , can be interpreted as average storage costs. As discussed above, the seasonal price increase can vary in individual years with unexpected fluctuations in supply. Government actions influence the seasonal price increase in two ways. The intervention quantity is the amount government buys, stores, and sells within the same crop year ($Q_{G2} - Q_{P2}$ in Figure 4). As this amount increases, the seasonal price increase should decline. The size of this intervention quantity depends on government's commitment to enforcing a narrow margin. Second, the government can add to or reduce unexpected changes in supply through changes in year-end carry-out of government stocks.

The impact of government actions on the seasonal price increase is estimated by the following model,

$$SI = a + b INT + c NCUS,$$

where

INT = intervention quantity as a proportion of production,

$NCUS$ = net change in unexpected supply as proportion of production.

The intervention quantity is the amount both procured and distributed within the crop year and this variable measures the effect of government actions on average returns to storage. Net change in unexpected supply is the difference between ($Q - Q^*$) and the changes in government carry-out. Q^* is approximated by a three-year moving average of production (Q). Changes in government carry-out

⁸ In the 1982 wet season the difference between the official floor price and the market price was twice as large as the 1981 wet season. Transaction costs became even more important in reducing sales to the marketing agency. One farmer reported that he spent two nights sleeping outside the NFA office while waiting in line to sell his paddy.

TABLE V
ESTIMATES OF THE DETERMINANTS OF SEASONAL PRICE INCREASES,
1962/63 TO 1980/81

Equation	R ²	Durbin-Watson Statistic
$SI = 24.61 - 2.44 INT - 0.84 NCUS$ (8.95) (-2.74) (-2.67)	0.57	1.62
$SI = 27.22 - 3.02 INT - 0.35 (Q - Q^*)$ (9.07) (-2.97) (-0.81)	0.40	1.97

- Notes: 1. SI =annual seasonal increases in Central Luzon (Cabanatuan) wholesale paddy prices.
 INT =government intervention quantity (purchased and sold within the same crop year) as a proportion of production.
 $NCUS=(Q-Q^*)$ minus the change in government stocks, as a proportion of production. The change in government stocks is procurements minus disbursements plus net imports.
 Q =production.
 Q^* =expected production (estimated as a three-year moving average of production).
2. T -statistics are in parentheses.

are procurements minus disbursements plus net imports. The dependent variable observations are annual seasonal increases (corrected for trend) from 1962/63 to 1980/81 in the wholesale price of paddy delivered to mills in Cabanatuan, Central Luzon. Since most storage is done at the mill, this price seems appropriate for testing changes in the returns to storage.

Variations in seasonal price increases are explained fairly well by this model (Table V). Increased government intervention has significantly reduced seasonal price increases, and during this period of observation had the most important influence on seasonal price increases. The estimated coefficients indicate that if government buys and sells an additional 1 per cent of the crop during the year, the result is a 2.4 per cent decline in the seasonal price increase.

Seasonal price changes also show a relationship to unexpected supply. As the total unexpected supply increases, the seasonal price change is smaller and vice versa. In order to test whether changes in government stocks had an impact on price increases, the model was also estimated with the variation in production ($Q-Q^*$) only. The coefficient of $Q-Q^*$ has the expected sign but is less significant and smaller than the coefficient of $NCUS$. Furthermore, the model including government stocks explains more of the variation in seasonal price increases.

These results are consistent with Bouis, who finds that uncertainty about the timing of imports caused unusual seasonal variations in Manila rice prices from 1961 to 1972 (Bouis [3, p. 90]). The model here includes the impact of untimely imports through the changes in stocks variable. Late imports are not disbursed and cause an unintended build-up of stocks. Theoretically, the government can reduce seasonal price increases by purchasing extra supply when there are bumper crops or drawing down stocks when harvests are bad. In fact, the correlation

TABLE VI
ESTIMATED COST OF THE NARROW OFFICIAL MARGIN, 1972/73 TO 1980/81

	Loss ^a (P/Ton)	Government Intervention ^b (1,000 Tons Rice)	Total Marketing Losses ^c (Million P)	Estimated NFA Loss ^d (Million P)	To Defend Official Prices Government Intervention ^e (1,000 Tons Rice)	Total Marketing Losses ^f (Million P)
1973/74	0	22.0	0.0	0.0	0.0	0.0
1974/75	69	95.9	6.6	0.0	122.7	8.4
1975/76	210	163.9	34.4	17.2	291.4	61.2
1976/77	195	198.8	38.8	15.7	320.9	62.6
1977/78	196	136.7	26.8	10.8	381.9	74.9
1978/79	0	74.7	0.0	0.0	0.0	0.0
1979/80	308	268.2	82.6	46.0	366.1	112.8
1980/81	413	250.1	103.3	65.3	517.2	213.6

^a The difference between normal costs of storage (26.1%) and the price increase allowed by official prices (from Table III), multiplied times the floor price at harvest. Loss assumed zero when official price increase is greater than 26.1%.

^b The amount of rice both procured and distributed within the crop year.

^c Loss per ton times the intervention quantity.

^d The difference between NFA's storage costs (15.6%) and the price increase allowed by official prices, times the intervention quantity.

^e The quantity the government must buy and sell within the crop year in order to defend official prices. This is estimated from the model in Table V by substituting the price increase allowed by official prices for *SI* and solving for *INT*.

^f Loss per ton times the intervention quantity needed to defend official prices.

between changes in government stocks and $Q - Q^*$ is -0.12 and is not statistically significant. Government actions have added to supply uncertainty as often as they have reduced it.

IV. THE COSTS OF INTERVENTION TO REDUCE MARGINS

A narrow spread between official prices forces the government to incur losses on storage. These losses are estimated by,

$$[(M_M - M_O) \times P_F] \times INT,$$

where

M_M = normal storage costs (26%),

M_O = real percent increase in official prices (from Table III),

P_F = official floor price,

INT = intervention quantity.

This is a low estimate of government costs (area *bdfg* in Figure 4) because it does not include any subsidy for transportation costs among regions.

During the NFA administration, the average loss per ton stored was P 232 (Table VI).⁹ The total cost of intervention varied with the size of the intervention quantity, and was highest in 1981 at P 103.3 million. These costs are not actually paid by the NFA, however, because the agency receives capital at subsidized

⁹ The peso to U.S. dollar exchange rate varied from 6.44 in 1971 to 8.2 in 1981.

interest rates of 6 per cent per annum from the central bank. In most years, about half of the marketing subsidy to producers and consumers of rice was paid by the central bank through foregone interest and half by NFA in the form of losses on storage activities.

As government intervention has not maintained official prices in most years, these actual costs are less than the potential cost of effective defense of a narrow margin. The amount of government intervention necessary to defend official prices is estimated using the model in Table V. The results in Table VI show that the required market intervention quantity was about twice the size of actual intervention. To defend official prices in 1980/81 would have required government storage of about 10 per cent of production (roughly 20 per cent of marketed supply) and a total cost of P 517 million.

These estimates do not include the costs of subsidized capital loaned to rice millers and traders. One of government's stated objectives is not to displace the private trade. Subsidized loans are offered to rice traders under two different programs, presumably to lower private marketing costs. The Grains Quedan Financing Program makes loans at 10 per cent annual interest with stocks bonded by NFA as security. From 1978 to 1982, P 516 million were disbursed under this program, primarily for stocks of paddy. Another program disbursed through Development Bank of the Philippines offers loans for investment in rice milling and working capital for storage at 14 to 18 per cent annual interest, and this program loaned P 297 million between 1971 and 1980. A rough estimate of the interest subsidy cost for these programs is P 71.6 million. This cost of subsidized capital extended to traders is an indirect cost of setting a narrow official margin.

V. CONCLUSIONS

A source of hidden costs in market intervention is the marketing loss made necessary by a narrow margin between official floor and ceiling prices. In the Philippines the difference between official floor and ceiling prices for rice in most years has not allowed for private returns to storage. Therefore, an implicit goal of price policy is to reduce seasonal price increases, requiring losses on government storage activities. Increased government intervention during the 1970s has reduced the seasonal fluctuations in paddy prices, but intervention has been inadequate to maintain producer prices at the official floor price. Thus farmer's opportunities to sell at official prices have been restricted.

The costs of government storage grew during the 1970s with the increased level of intervention, and were highest at P 103 million in 1980/81. About half of this cost is paid by the central bank in the form of subsidized interest rates on working capital loaned to the government marketing agency. These costs were incurred even though market prices differed substantially from official prices. Adequate intervention to defend official prices would have required the government to handle 20 per cent of marketed supply and to incur losses of P 517 million in 1980/81.

Ineffective intervention and marketing subsidies are the result of conflicting

objectives for price policy. In the Philippines, the usual conflict between producer and consumer interests cannot be resolved with a marketing subsidy because the government also wishes to maintain a role for private trade (Rausser and Yassour [8, p. 493]). As a result, floor prices have not been defended and incentives are offered to private trade through subsidized loan programs. This creates privileged groups of producers and traders.

Explicit recognition of the conflict among objectives would allow formulation of a more consistent and effective price policy. The objective of reducing marketing margins could be achieved with non-price policy instruments such as investment in transportation and communications infrastructure or through policies to encourage growth of financial institutions for private trade. It would then be easier to set and defend official prices that cover normal marketing costs, and government intervention would occur only when unexpected changes in supply cause unusual price fluctuations. This set of policies would serve the interests of rice producers and consumers better in the long run than the current ineffective intervention.

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