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WHO BENEFITS FROM THE POST-HARVEST RICE PRICE RISE?

by

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Who Benefits from the Post-Harvest Rice Price Rise?*

Economists are guilty along with sociologists in perpetuating the stereotype that because the farmer lacks finance, he is forced to sell his crop before or immediately after harvest, driving prices down. With credit, he could benefit by the higher post-harvest prices. Sacay gives emphasis to this stereotype as follows:

> "As a result of this (production) seasonality, prices are depressed during peak production periods and high during off-season months. For a farmer to take advantage of high prices, he must postpone the sale of his products. However, since the general level of farm income is low, agricultural products have to be sold immediately after harvest unless advances on future sales such as commodity loans are obtained"1/

Mabbun in his use of the stereotype brings out the additional connotation that the middleman by buying at low prices benefits at the expense of the farmer, with a windfall from high prices going somehow automatically to those who can afford to hold stocks for later sale.2/ There is both

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1/ Orlando J. Sacay, "The Role of Credit in the Marketing of Agricultural Products," in 1st National Seminar on Agricultural Marketing, Manila (September 7-25, 1965), p. 133.

2/ Pablo N. Mabbun, "The Role of Farmers' Cooperatives in Raising Production and Income in the Philippines," Economic Research Journal (September 1964), p. 99. These same inferences are expressed by E. U. Quintana, et al, "The Present Situation and Outlook of the Rice Marketing Facilities with Emphasis on their Implications on the Present Rice Problem of the Country," in Rice and Related Statistics, U.P. Statistical Center (1965), pp. 215-16.

truth and fallacy in this stereotype but it is only recently that studies are providing empirical evidence for distinguishing between the two.

The authors have demonstrated elsewhere that intraseasonal price fluctuations in the Philippines can be large in some years even though seasonal indices indicate small price spreads approaching the costs of holding.[3/] Years with large annual price spreads were found to be interspersed with years with little or even negative price movements. In India, recent studies demonstrated a similar year to year balancing in a number of rice, wheat and sorghum markets. On average over the years, prices rose seasonally sufficient to cover only storage costs and risks.[4/] Does this suggest that the trader assumes risks that the smaller farmer generally would be unable to assume?

There is another fine assumption involved in the above stereotype that adds further question to the conclusions drawn. This is the assumption that holding stocks either is costless or that there is zero opportunity cost of the capital tied up. But would it pay the farmer to

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3/ Leon Mears and Teresa Anden, "Rice Prices and Rice Price Policy," U.P. School of Economics, IEDR Discussion Paper No. 71-19 (Sept. 7, 1971). While annual retail price peaks were observed in excess of 40 percent above post-harvest retail lows, seasonal spread based on the seasonal index from 1957/8 - 1968/9 did not exceed 15 percent for any of the major markets. Similar wide annual spreads were found at farm levels with considerably larger spreads of the seasonal index.

4/ Uma Layant Lele, "Efficiency of Jowar Marketing: A Study of Regulated Markets in Western India," unpublished Ph.D. thesis, Cornell University (September 1965) and Malcolm J. Purvis, "Marketing of Foodgrains in India: An Economic Appraisal of Government Intervention," unpublished M.S. thesis, Cornell University (June 1964), both as reported by John W. Mellor, The Economics of Agricultural Development, Cornell University Press (1966), p. 334.

hold stocks for post-harvest sale if he had to pay market charges for a loan and if he considered also the other economic costs of holding such as storage, insurance, losses and risks from uncertainty?

The authors have examined rice price swings in the Philippines to distinguish truth from fallacy in the above stereotype. After explaining the methodology utilized, the market performance is evaluated in terms of the following: 1) Would the miller/trader benefit from holding palay stocks? 2) What is the farmer's situation? 3) How do the miller's and farmer's situations compare? and 4) What do these findings suggest for policy makers?

I Methodology

Market performance is approached from the seasonal point of view by examining: (1) the probability that a farmer or trader having his own or purchased palay at harvest season would risk taking a loss if he held the palay for future sale, and (2) the profit rate that would be realized by holding such palay after harvest. These approaches are in essence an examination of the change of price and margin over time (in the period after harvest). They assume that the farmer will not hold nor will the trader decide to hold palay unless it would be expected that the costs of holding would be covered, plus some added premium (margin) to compensate for risk, at time of future sale. Thus, this assumes a rising price as long as palay is held after harvests. If consumption is inadequate to liquidate this stock before the 2nd harvest, either the balance must be disposed of by export or a favorable speculative climate

must continue to exist if traders are to be induced to hold the stocks longer.

So, during the seasonal period, excellent performance would approach that expected of a competitive market. Farm and retail prices would be rising after harvest to cover holding costs but the margin between these prices in any given period would be relatively constant throughout the year.[5/] Prices might decline slightly sometime during the 2nd harvest but would then continue to rise until the new harvest period approached. Exports, if allowed, would have to be taken into account in predicting the above pattern.

To evaluate the performance, two general approaches have been used. In both, the monthly cost of holding palay has been calculated to determine the expected absolute price increase of palay in a competitive market, as follows:

$$C_h = \frac{P_{fo}}{12} (r_1 + r_n + r_i) + s$$

where: C_h = monthly cost of holding palay

P_{fo} = farm price[6/] (i.e. prices received by farmers) per cavan during base month, where base month is

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5/ Whether or not the margin is absolutely constant depends on the usual custom of the trader. While he might be in the habit of an absolutely constant margin, he might also customarily expect a certain percent mark-up. Finally, he might work in between these two, increasing the margin absolutely to compensate for these costs that vary with price, such as interest, insurance, etc.

6/ When a farmer holds palay in a commercial warehouse at the wholesale market, P_{fo} is replaced by P_{wo}, the price of palay at that market in the base month. Gains or losses in this situation are a comparison of sales after holding with those during base month sales in both cases assumed being made in the wholesale market.

low-price month during harvest season, i.e. November for Luzon/Cabanatuan, Luzon/Manila, S & W Mindanao/Cotabato, Western Visayas/Iloilo, and October for Ilocos/Laoag market.

r_l = rate of storage losses from insects and pests at 3% per year.

r_n = insurance rate at 1% per year.

r_i = interest rate, 12% per year as charged by Rural Banks.

s = storage cost at P0.05/month/cavan of palay (or P0.09/month in terms of rice equivalent).[7/]

Approach 1 - Profit from holding palay

The rate of profit has been figured in two ways. (a) Profit (R) or (r) is the absolute net profit at time of sale, and is calculated as a percentage of the palay (or rice) value-in-sale at time of acquisition. This measure indicates the maximum absolute profit and would be a useful criteria for a farmer or trader if he had no alternative use for his capital. The decision rule would then be: sell when the absolute profit (rate of profit in this sense) is expected to be the greatest. (b) Profit ($\bar{R}$) ($\bar{r}$)is calculated as in (a) above but converted into per annum yields. This measure would be useful to farmers and traders with

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7/ During the time of this study, millers frequently imposed a flat P0.50/cavan storage charge. Where this was the practice, calculated probabilities of loss for farmers and traders would be slightly underestimated for periods shorter than 10 months.

alternative uses for their capital. The decision rule could be: sell when the per annum yield is expected to drop below the opportunity cost of capital.

Each of these rates of profit (or yields) were calculated for conditions facing the farmer and trader as follows:

(a_1). Farmer holds palay on the farm and sells later on the farm.

(a_{1a}). For a given year:

$$R_m = \frac{P_{fm} - P_{fo} - C_{hm}}{P_{fo}} \times 100$$

where:

R_m = rate of profit (above normal profit) from holding palay to month m

P_{fm} = price of palay at the farm in month m

C_{hm} = cost of holding palay to month m

m = number of months after the base month

(a_{1b}). Over a period of years:

$$r_m = \frac{\sum_{y=1}^{y=t} (P_{fm} - P_{fo} - C_{hm})_y}{\sum_{y=1}^{y=t} (P_{fo})_y} \times 100$$

where:

r_m = rate of profit (above normal profit) from holding palay each year for m months and selling an equal quantity

during month m during each year of the period.

t = number of years under study.

(a_2). Farmer holds palay in commercial warehouse at wholesale market and sells later as palay in that market.

(a_{2a}). For a given year:

$$R_m = \frac{P_{wm} - P_{wo} - C_{hm}}{P_{wo}} \times 100$$

where:

P_{wm} = price of palay at the wholesale market in month m

P_{wo} = price of palay at the wholesale market in base month

(a_{2b}). Over a period of years:

$$r_m = \frac{\sum_{y=1}^{y=t} (P_{wm} - P_{wo} - C_{hm})_y}{\sum_{y=1}^{y=t} (P_{wo})_y} \times 100$$

(a_3). "Trader" buys palay at farm in base month and sells later as rice at retail in city.

The "trader" here, and in the analysis to follow, is considered as a proxy including all those middlemen and processors who might be involved in handling the palay from the farm through its processing, and selling it at retail. Thus, the alternative open to this "trader" is to buy palay at the farm and sell it at retail in the base month or later, after milling. If rice production and milling were fully integrated, the farmer also could act as a "trader", but it is unlikely that this is the

case in the Philippines except in rare instances. So, in general this "trader" will be one or a group of non-farmers. In these calculations, it is assumed that the margin between farm and retail remains constant.[8/] In other words, with prices referring to similar units in all markets, profit results whenever $P_{rm} > (P_{fo} + M_o + C_{hm})$

where:

P_{rm} = price of rice at retail in month m

M_o = farm to retail margin in base month

(a_{3a}). For a given year, then

$$R_m = \frac{P_{rm} - P_{ro} - C_{hm/0.55}}{P_{ro}} \times 100$$

where:

R_m = rate of profit (above normal profit) from holding palay for m months after purchase and selling it as rice during month m

P_{rm} = per cavan price of rice at retail in month m

P_{ro} = per cavan price of rice at retail in the base month

$C_{hm/.55}$ = cost of holding palay to month m in terms of its rice equivalent

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8/ This assumption was used based on the findings of Mahar Mangahas in his study of secular price movements where in most regions in the Philippines, farm-retail margins stayed constant when farm prices rose, see Mahar Mangahas, et al, Production and Market Relationship for Rice and Corn in the Philippines, International Rice Research Institute, Technical Bulletin 9 (1970), p. 67. A hypothesis explaining this market response is detailed by Vernon W. Ruttan, "Agricultural Product and Factor Markets in Southeast Asia," mimeographed paper presented at the Agricultural Development Council/University of Kentucky Seminar, at Lexington, Kentucky (April 26-30, 1967), pp. 7-ff.

(a_{3b}). Over a period of years:

$$r_m = \frac{\sum_{y=1}^{y=t} (P_{rm} - P_{ro} - C_{hm}/0.55)_y}{\sum_{y=1}^{y=t} (P_{ro})_y} \times 100$$

where:

r_m = rate of profit (above normal profit) from holding palay each year for m months after purchase and selling an equal quantity of rice during month m during each year of the period.

(b). The profit rates calculated as in (a) above can all be converted into per annum yields by multiplying the right hand side of the equations by 12/m.

Approach 2 - Probability of taking a loss from holding palay.

Probability of taking a loss by holding palay for later sale as palay (or rice) has been calculated for a series of years. First, loss or gain for a particular month of each year has been determined as follows:

(a) Farmer holds palay on the farm and sells later on the farm.

$$\text{Loss if } \frac{P_{fm}}{P_{fo} + C_{hm}} < 1$$

(b) Farmer holds palay in a commercial warehouse and sells later as palay in the wholesale market.

$$\text{Loss if } \frac{P_{wm}}{P_{wo} + C_{hm}} < 1$$

(c) Trader buys palay at farm in base month and sells as rice at retail in the city.

$$\text{Loss if } \frac{P_{rm}}{P_{ro} + C_{hm}/.55} < 1$$

For each market and for each assumption, the losses and gains are totalled for each month over the period of years analyzed (1957/58 to 1968/69) and the probability of loss from holding estimated as follows:

Probability of loss for sale in month m =

$$\frac{\text{No. of years with a loss in month m}}{\text{Total number of years}}$$

To the extent that some traders might calculate on the basis of a proportional rather than absolute margin, the probability of loss would be slightly greater than shown in calculations to follow. In other words, loss probabilities as calculated may be slightly conservative. These probabilities are conservative in the other respect that one holding cost, the premium for risk, has not been included in C_{hm}. This will vary depending upon the individual's evaluation.

II Would the Miller/Trader Benefit from Holding Stocks?

Over the years from 1957/58 to 1968/69 millers and traders would have had monthly holding costs (excluding risk premium for uncertainty) that varied between 1.25 and 1.41 percent of palay cost. Without considering this risk premium, market prices would have had to rise monthly by these percentages if the miller/trader were to obtain a normal

profit from sale of palay after holding.

Probabilities of loss in different regions from the trader holding palay and selling it as milled rice in later months are shown in Table 1. For example, millers in Central Luzon who purchased their palay in November and sold 6 months later in Manila, would not have been able to cover minimum holding costs 83.3 percent of the years. Their lowest probability of loss (66-2/3 percent) would have resulted if they had sold each year after holding for 11 months. If they had purchased palay in December rather than November, they generally would have had lower probabilities of loss with the optimum month of sale being the 9th month -- still with a 50 percent probability of loss. For January purchases, probability of loss declined further to only 38.5 for sales in the 7th and 8th months after harvest.

Again referring to Table 1, with high probabilities of loss indicated for all markets, it is evident that favorable-price years must have been interspersed with unfavorable-price years to make possible the low seasonal price spreads of seasonal indices approaching holding cost levels. The market area showing the lowest probabilities of loss generally was the S.W. Mindanao/Cotabato region. There, probabilities of loss would have dropped to 41.7 percent if sales had always been made in either the 5th or 6th month after purchase. But even in this market area, during 1968/69 when price movements were least satisfactory, all sales made after the 1st month would have been at prices that did not cover holding costs, see Chart 1. And, the 1.8 percent profit rate

TABLE 1

Traders' Probability of Loss[1/] (after deducting holding costs[2/]) from Selling Equal Quantities of Rice at Retail During Each Year from 1957/8 to 1968/9, after Holding Palay for Months Indicated after Farm Gate Purchase in Month Shown[3/]
(in percent)

Case #	Farm Region/ Retail Market \ Months Held Before Selling	1	2	3	4	5	6	7	8	9	10	11	12	Month Palay P
1	Central Luzon/Manila	83.3	91.7	91.7	83.3	91.7	83.3	75.0	91.7	75.0	75.0	66.7	75.0	Novem
2	Central Luzon/Manila	75.0	75.0	75.0	83.3	75.0	66.7	66.7	66.7	50.0	58.3	58.3	75.0	Decem
3	Central Luzon/Manila	76.9	69.2	76.9	76.9	61.5	53.8	38.5	38.5	61.5	61.5	69.2	69.2	Janua
4	Central Luzon/Cabanatuan	83.3	83.3	83.3	83.3	91.7	91.7	75.0	83.3	91.7	66.7	83.3	83.3	Novem
5	S.W. Mindanao/Cotabato	75.0	83.3	58.3	66.7	41.7	41.7	50.0	50.0	50.0	66.7	58.3	83.3	Novem
6	Ilocos/Laoag	83.3	91.7	100.0	100.0	100.0	91.7	83.3	83.3	83.3	75.0	58.3	66.7	Octob
7	W. Visayas/Iloilo	100.0	91.7	100.0	100.0	91.7	75.0	66.7	66.7	58.3	58.3	66.7	75.0	Novem
8	Central Luzon/Manila[4/]	90.0	70.0	60.0	70.0	60.0	70.0	60.0	60.0	60.0	60.0	60.0	80.0	Novem

1/ Probability of Loss in % = $\frac{\text{Number of Years Showing a Loss}}{\text{Total Number of Years}} \times 100$

2/ No premium deducted for risk from uncertainty.

3/ Palay, macan ordinario and rice, macan 2nd class except for Case 8.

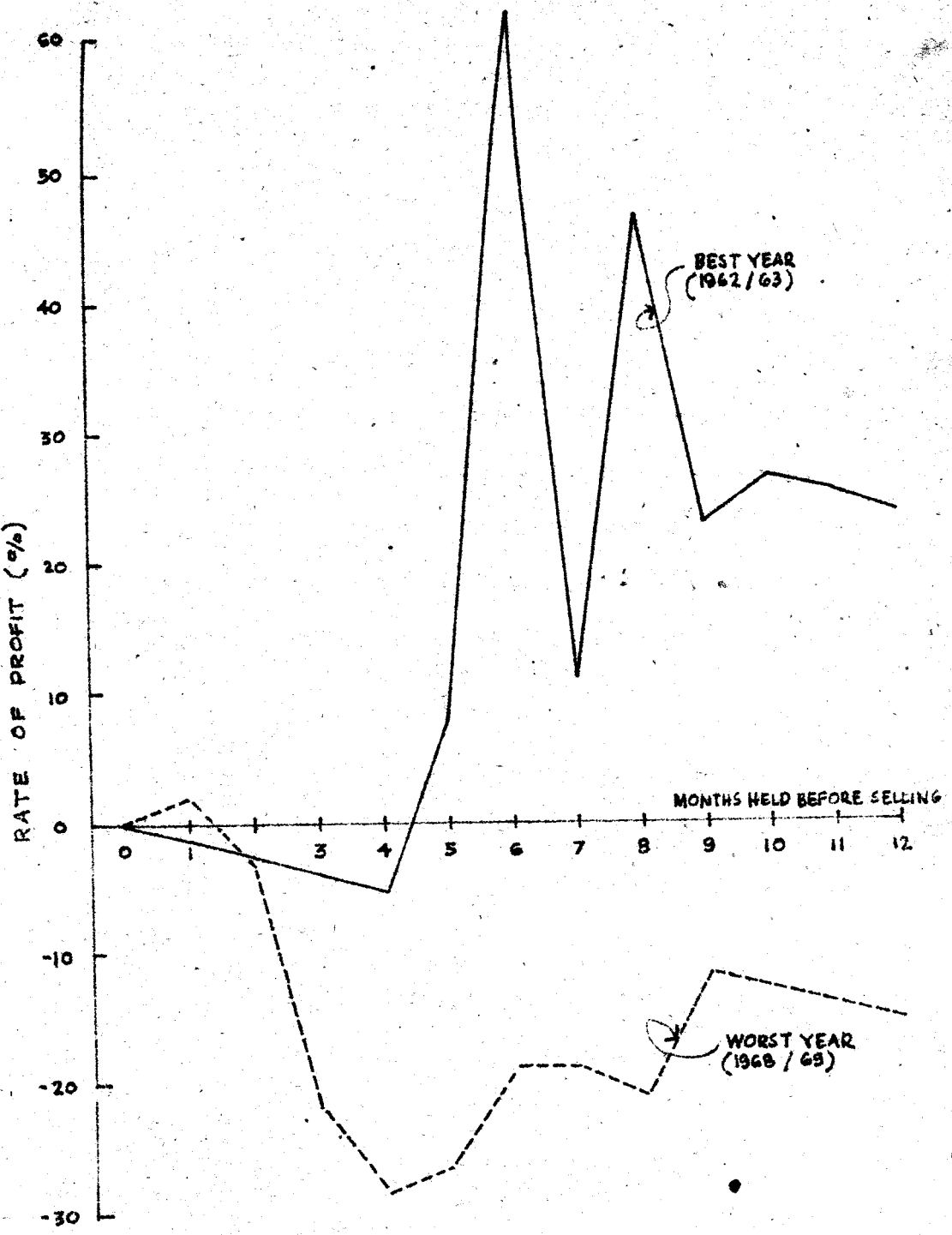
4/ Wagwag palay and wagwag 1st class rice (1959/60 - 1968/69 only).

Sources: Basic prices: See Appendix I.

CHART 4

TRADERS' RATE OF PROFIT (OR LOSS) (AFTER DEDUCTING HOLDING COSTS BUT NOT INCLUDING RISK FROM UNCERTAINTY), FROM SELLING RICE AT RETAIL IN CITY MARKET IN 1962/63 AND 1968/69 AFTER HOLDING FOR MONTHS INDICATED AFTER FARM PURCHASE OF PALAY IN NOVEMBER, EXPRESSED AS A PERCENT OF THE NOVEMBER RETAIL PRICE.

MACAN ORDINARIO, SOUTHWESTERN MINDANAO/COTABATO



Source: See Appendix III.

(21.4 percent on an annual yield basis) that could have been realized for that month was at least partially a payment for risk.9/ In the most favorable-price year (1962/3), losses would have resulted for all sales made before the 5th month. But for sales in the 6th or 8th months, an extremely large profit would have been realized, even after deducting a portion as a risk premium.

Chart 2 illustrates the extent to which favorable-price years were offset by unfavorable ones in major trading regions. The overall average rates of profit or loss indicated would have resulted if equal holdings had been sold during the same month in all years. In the S.W. Mindanao market, losses would have accrued to any trader/miller selling before the sixth month or after the ninth. If this same selling pattern had been followed in Western Visayas or Central Luzon, traders/millers would have shown a loss no matter what month they had chosen for selling.

Seasonal spread of selected seasonal price indices are shown in Table 2. Neither these price spreads nor the profit rates shown in Chart 2 provide a basis for accurate prediction whether profits or losses will result from holding stocks during any specific year. It is probable that this unpredictability arises from highly imperfect markets, but as Mellor suggests, these imperfections probably result more from

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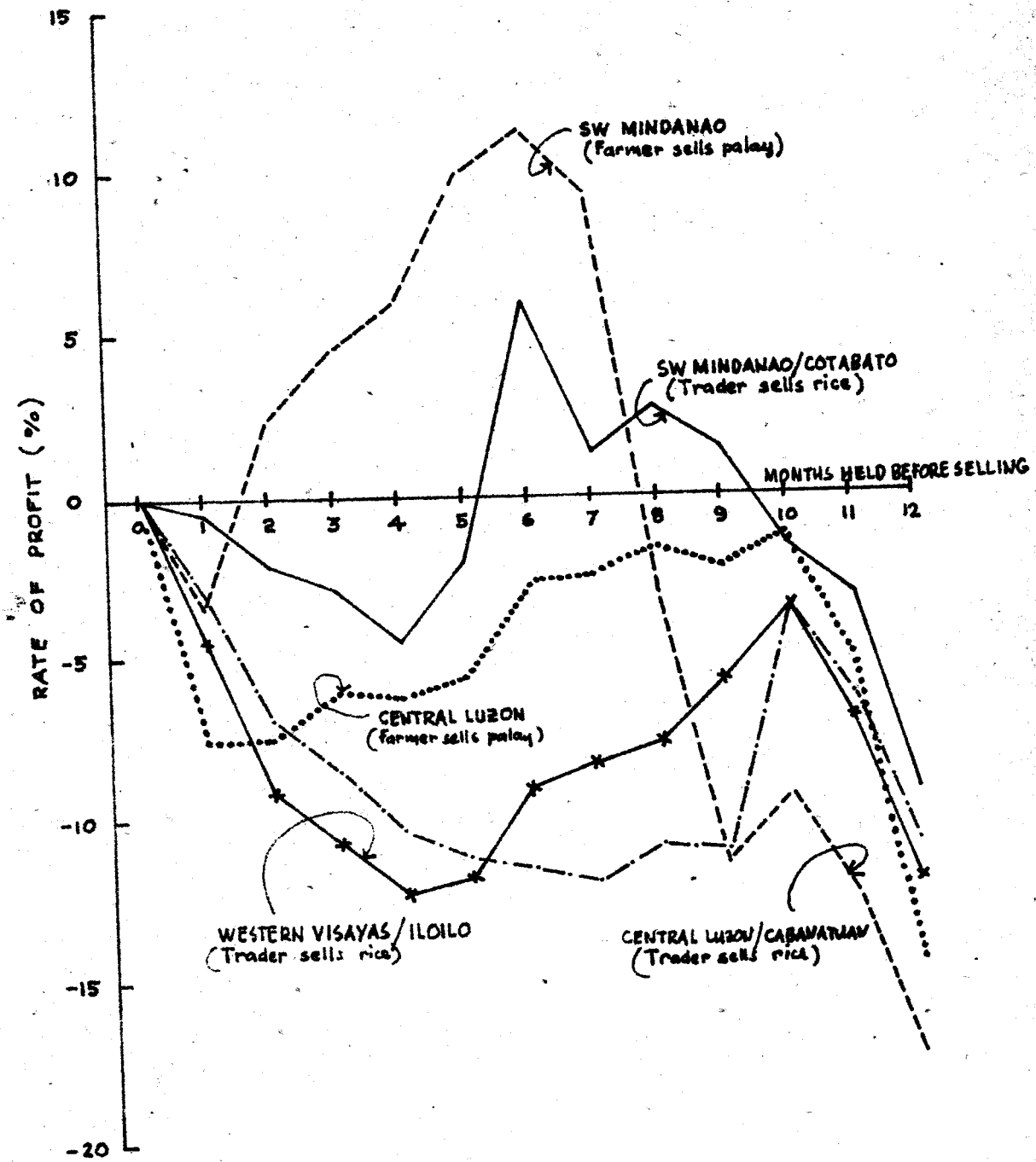
9/ See Appendices II to IV for summaries of profit and yield calculations for millers/traders.

CHART 2

TRADERS' AND FARMERS' RATE OF PROFIT (OR LOSS) (AFTER DEDUCTING HOLDING COSTS BUT NOT INCLUDING RISK FROM UNCERTAINTY) FROM SELLING EQUAL QUANTITIES OF RICE AT RETAIL IN CITY MARKETS (PALAY AT WHOLESALE) EACH YEAR FROM 1957/58 – 1968/69 AFTER HOLDING PALAY FOR MONTHS INDICATED AFTER FARM ACQUISITION IN NOVEMBER. (PALAY, MACAN ORDINARIO; RICE, MACAN 2ND CLASS)



Source: See Appendices II & V.

TABLE 2

Farm and Retail Price Variations from Seasonal Low to Seasonal High for Selected Regions 1957/1970 & 1962/70

Region	FARM PALAY PRICE % Price Increase from Seasonal Low to Seasonal High			RETAIL RICE PRICE % Price Increase from Seasonal Low to Seasonal High	
	1957/70 Index	1962/70 Index	Trading Center	1957/70 Index	1962/70 Index
Cagayan Valley	13.0	11.1	Tuguegarao	14.3	9.3
Central Luzon	16.4	15.2	Manila	9.1 1/	7.9
Ilocos	17.4	22.8	Laoag	12.4	9.5
N.E. Mindanao	11.7	10.9	Iligan	5.8	4.5
S.W. Mindanao	13.1	19.2	Cotabato	10.4	12.3
Western Visayas	21.2	20.1	Iloilo	14.3	13.1

1/ 1955/1970 period.

Sources: Basic prices: See Appendix I.

imperfect knowledge than from collusion.[10/]

III What is the Farmer's Situation?

The farmer faces a somewhat different set of alternatives. He could sell either at the farm gate or in the wholesale market with sales at harvest or later after storing palay either on the farm or in a commercial/miller's warehouse. If he obtains a commodity loan from a formal financial institution, the farmer will be obliged to store the palay in a commercial (or FaCoMa) warehouse. Under these circumstances, his costs of holding will be on the same basis as for the trader/miller, including all holding costs and averaging 1.8 percent of harvest time palay value per month over the storage period.

His probability of loss from selling an equal quantity in the Cabanatuan wholesale market in a given month each year from 1957/58-1967/68 would have been only slightly less than for the miller (see Case 4, Table 3). Only for sales in the 7th or 10th month would it have been less than 50 percent. Given the different intraseasonal price structures at farm gate over these years, the farmer's probability of loss would have been somewhat reduced if he had chosen to make all sales at the farm (Case 1) rather than in the Cabanatuan wholesale market.

It is interesting to observe that price structures were such that the S.W. Mindanao farmer would have had lower probabilities of loss if he had followed a strategy opposite to the optimum for the Central

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10/ John W. Mellor, The Economics of Agricultural Development, op. cit., p. 334.

TABLE 3

Farmers' Probability of Loss[1] (after deducting holding costs[2]) from Selling Equal Quantities of Palay -- at Farm Gate or Wholesale Market -- During Each Year from 1957/8 to 1967/8, after Holding for Number of Months Indicated after November Harvest[3]
(in percent)

Case #	Farm Region \ Months Held Before Selling	1	2	3	4	5	6	7	8	9	10	11	12	Place of Sale	Costs of Holding Deducted
1	Central Luzon	63.6	54.5	36.4	36.4	27.3	27.3	36.4	27.3	27.3	54.5	81.8	90.9	farm gate	all
2	Central Luzon	36.4	27.3	27.3	27.3	18.2	18.2	27.3	18.2	18.2	45.4	63.6	81.8	farm gate	losses & interest
3	Central Luzon	9.1	27.3	18.2	9.1	9.1	9.1	0	18.2	18.2	9.1	45.4	54.5	farm gate	losses
4	Central Luzon	91.7	83.3	75.0	83.3	66.7	58.3	41.7	58.3	50.0	41.7	50.0	91.7	Cabanatuan	all
5	S.W. Mindanao	75.0	41.7	41.7	16.7	16.7	16.7	25.0	41.7	66.7	58.3	58.3	58.3	Cotabato	all
6	S.W. Mindanao	63.6	27.3	45.4	45.4	36.4	36.4	45.4	27.3	63.6	45.4	72.7	81.8	farm gate	all

1/ Probability of Loss in % = $\frac{\text{Number of Years Showing a Loss}}{\text{Total Number of Years}} \times 100$

2/ Premium for risk from uncertainty not deducted.

3/ Palay, Macan ordinario.

4/ All costs include interest, storage, insurance and losses.

Sources: Basic prices: See Appendix I.

Luzon farmer and made his sales at the Cotabato market rather than on the farm. It is important to observe that these high loss probabilities present quite a contrast to the picture of windfall profits inferred by the stereotype.

IV Comparison of the Miller's and the Farmer's Situations.

From the above, it is evident that there are substantial intra-seasonal price fluctuations in certain years that provide the astute trader a chance for profits but this tends to be a profit from astute trading, not from the simple act of storing. And the trader must be able to take the loss if his speculation goes sour. Many less capable traders fail when they lose their gamble.[11/] Lacking the background of the trader, it's likely that the farmer would be less successful in his trading and it is certain that few could stand the losses that some years would bring.

It is only when the farmer considers his own funds as having zero opportunity cost or can obtain an interest-free loan that his probability of loss would reach levels that might possibly be tolerable. Case 3 on Table 3 assumes such a situation with sales made at farm gate and all storage costs except storage losses assumed away. On that rather non-economic basis (but one which might be in the minds of some farmers)

11/ For documentation of millers/traders who have failed, see Chesan A. Chua, "Rice Milling in the Philippines," unpublished B.A. thesis, U.P. College of Business Administration, Quezon City (1957/58), pp. 11-ff.

the probability of loss over the 1957/58-1967/68 period dropped to zero for sales in the 7th month and were below 30 percent until the 10th month. But even under this somewhat unrealistic condition, unfavorable-price years did appear. Chart 3 shows a comparison of the rates of loss that would have arisen from sales at farm gate in the best and worst-price years, according to whether the farmer calculated on a full or partial cost basis.12/ If sales had been made in the wholesale market, rates of loss in the worst-price year would have been even larger (see Chart 3).

V What Do These Findings Suggest for Policy Makers.

Findings described above which conflict with the stereotype position should not be taken to suggest that wide price swings do not raise both economic and political problems. When rice prices rise, there is the concern for the urban poor and the small farmer who must buy rice from the market late in the season. At the farm level, the large drop in price as the market is flooded at harvest time can seriously reduce incentives to use modern high yielding inputs. And for the miller, if he cannot reasonably predict seasonal price changes, he must remain basically a trader with little concentration given to efficient processing.13/ Under these conditions the incentive is weak to invest

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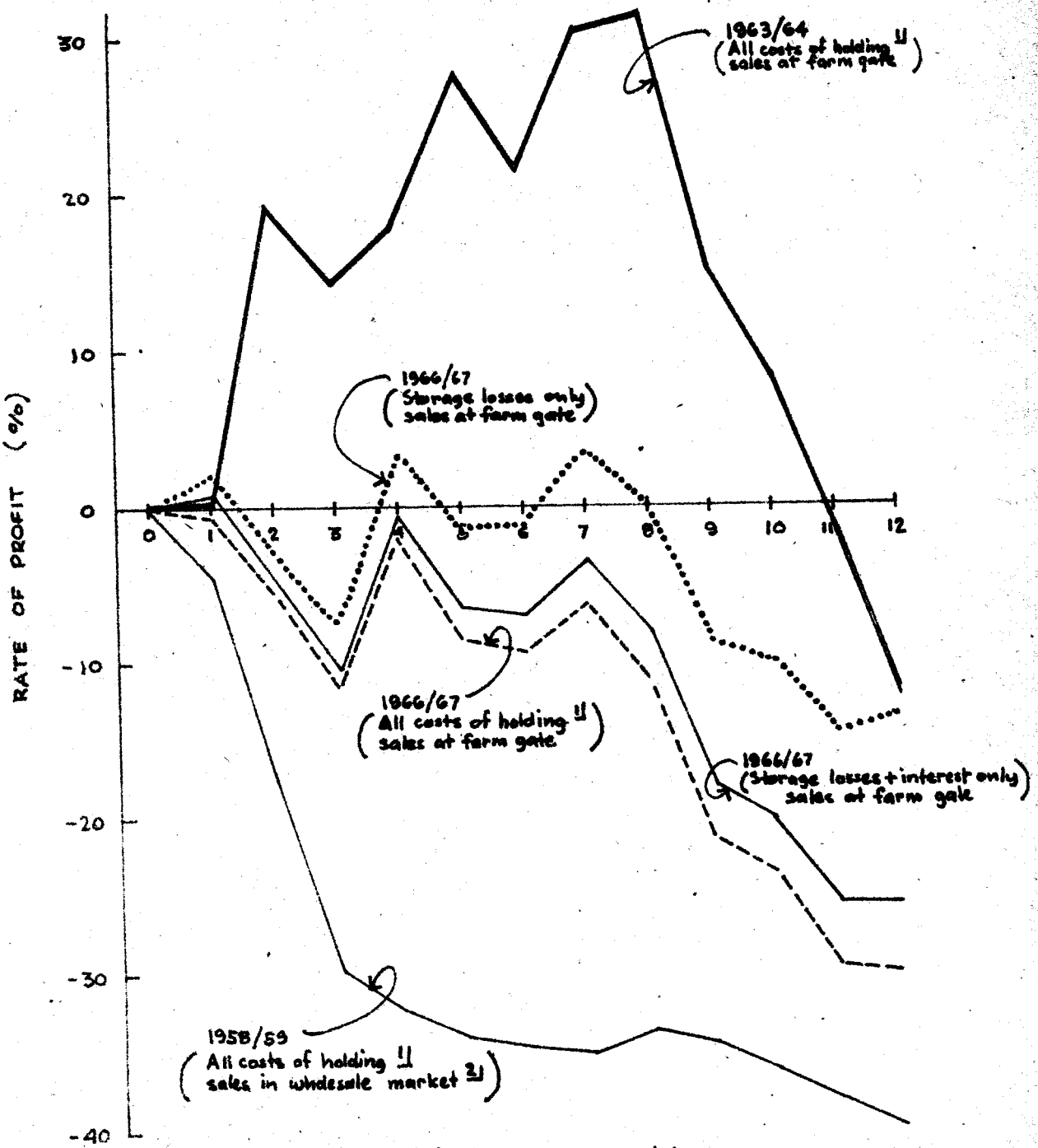
12/ See Appendices V to VII for summaries of rates of profit and yield to the farmer under different selling assumptions.

13/ Chesan A. Chua in his study of Philippine rice milling emphasizes the general findings of the authors. He reports, "profits are made only from fluctuations or changes in the price of rice. Profits of rice mills come not from the milling of rice, but from change or increase in the price of rice," op. cit., p. 11.

CHART 3

FARMERS' RATE OF PROFIT (OR LOSS) (AFTER DEDUCTING HOLDING COSTS BUT NOT INCLUDING RISK FROM UNCERTAINTY) FROM SELLING PALAY IN 1963/64 1958/59 AND 1966/67 AFTER HOLDING PALAY FOR MONTHS INDICATED AFTER FARM PURCHASE IN NOVEMBER AT HARVEST TIME EXPRESSED AS A PERCENT OF THE PRICE OF PALAY IN NOVEMBER.
MACAN ORDINARIO, CENTRAL LUZON / CABANATUAN



1/ All costs include interest, insurance, storage and losses

2/ Cabanatuan wholesale market

Source: See Appendix VI.

in capital intensive modern milling equipment. At least until there is strong evidence that more accurate information can be made readily available upon which to base predictions, price policy implementation tied to buffer stocks should be seriously considered. Effectively implemented, such a policy can reduce intraseasonal swings to levels close to holding costs. Success of millers will be more closely related to efficient mill operations than to price speculation.14/

14/ Price policy recommendations are discussed in greater detail by the authors in Discussion Paper No. 71-19 (September 7, 1971).

APPENDIX I

Rice Prices: Variety, Periods, Sources and Geographic Areas Covered

Variety	Period	Area	Source
	Farm Prices (palay prices received by farmers, 44 kgs)		
Macan ordinario or equivalent	1957-1970, monthly	Nation, regions	(1)
Wagwag 1st class or old harvest	1959-1970, monthly	Central Luzon	(1)
	Wholesale Prices (palay, 44 kgs)		
Macan ordinario or equivalent	1957-1970, monthly	Cabanatuan	(2)
Macan ordinario or equivalent	1957-1970, monthly	Cotabato	(2a)
	Retail Prices (milled rice, ganta)		
Macan 2nd or equivalent	1955-1970, monthly	Manila	(2)
Macan 2nd or equivalent	1957-1970, monthly	Cotabato, Cabanatuan, Iloilo, Laoag	(3)
Wagwag 1st class	1957-1970, monthly	Manila	(2)

(1) DANR, Bureau of Agricultural Economics
(2) Bureau of Commerce, Manila
(2a) Bureau of Commerce, Cotabato Branch
(3) Central Bank, Department of Economic Research except for Cotabato from Bureau of Commerce - Cotabato Branch up to July 1966. After July 1966 from Bureau of Commerce, Manila.

APPENDIX II

Traders' Rate of Profit[1] (or Loss) and Per Annum Yield[2] (after deducting holding costs)[3] from Selling Equal Quantities of Rice at Retail in City Markets During Each Year from 1957/58 - 1968/69, after Holding Palay for Months Indicated after Farm Gate Purchase During Low-Price Month[4]

Farm Region/Retail Market	Month of Purchase \ Months Held Before Selling	1	2	3	4	5	6	7	8	9	10	11	12
						I - Rate of Profit (in percent)							
Central Luzon/Manila	November	-5.0	-6.5	-7.3	-8.5	-9.6	-8.5	-8.8	-8.8	-7.5	-4.9	-6.6	-10.8
Central Luzon/Manila	December	-1.9	-2.9	-4.3	-4.8	-3.8	-5.0	-4.1	-2.7	-0.1	-0.4	-4.9	-10.4
Central Luzon/Manila	January	-0.6	-2.1	-3.6	-2.3	-2.5	-2.3	-1.0	+2.1	+0.3	-4.2	-9.3	-11.2
Central Luzon/Cabanatuan	November	-3.3	-6.9	-8.6	-10.4	-11.2	-11.5	-12.0	-10.8	-11.0	-3.4	-6.1	-10.8
S.W. Mindanao/Cotabato	November	-0.6	-2.1	-2.9	-4.5	-2.0	+6.0	+1.3	+2.7	+1.4	-1.6	-3.1	- 9.4
Western Visayas/Iloilo	November	-4.6	-9.2	-10.7	-12.3	-11.9	-9.0	-8.2	-7.7	-5.8	-3.5	-6.9	-12.2
						II - Per Annum Yield (in percent)							
Central Luzon/Manila	November	-60.0	-39.2	-29.1	-25.5	-23.0	-17.1	-15.1	-13.2	-9.9	-5.9	-7.2	-10.8
Central Luzon/Manila	December	-22.6	-17.6	-17.2	-14.5	-9.1	-10.0	-7.1	-4.1	-0.1	-0.5	-5.4	-10.4
Central Luzon/Manila	January	-7.2	-12.4	-14.4	-6.8	-6.0	-4.6	-1.7	+3.2	+0.4	-5.0	-10.1	-11.2
Central Luzon/Cabanatuan	November	-39.1	-41.4	-34.4	-31.3	-27.0	-23.0	-20.6	-16.1	-14.6	-4.1	-6.6	-10.8
S.W. Mindanao/Cotabato	November	-2.4	-12.8	-11.6	-13.6	-4.8	+12.0	+2.2	+4.1	+1.9	-2.0	-3.4	-9.4
Western Visayas/Iloilo	November	-55.4	-54.9	-42.9	-36.9	-28.4	-18.0	-14.1	-11.5	-7.7	-4.2	-7.6	-12.2

1/ Rate of profit expressed as percent of the base month retail prices from 1957/58-1968/69.
2/ Per Annum Yield (in %) = Rate of Profit (in %) x $\frac{12}{m}$; may not equal due to rounding.
3/ Premium for risk from uncertainty not deducted.
4/ Palay, Macan Ordinario; Rice, Macan 2nd Class.

Sources: Basic prices: See Appendix I.

APPENDIX III

Traders' Rate of Profit[1] (or Loss) (after deducting holding costs)[2] from Selling Rice at Retail in City Markets in Selected Years (best and worst)[3] after Holding Palay for Months Indicated after Farm Gate Purchase During Low-Price Month[4]

Farm Region/Retail Market	Year	Month of Purchase	Months Held Before Selling: 1	2	3	4	5	6	7	8	9	10	11	
						I - Best Years								
Central Luzon/Manila	1963/64	November	-5.5	-2.7	5.1	7.1	5.7	10.2	12.2	20.0	17.0	11.5	-1.5	-2
Central Luzon/Manila	1963/64	December	3.0	11.1	13.2	11.8	16.5	7.4	26.7	23.5	17.8	4.2	1.9	0
Central Luzon/Manila	1964/65	January	7.6	9.3	7.7	12.0	13.7	21.3	18.0	12.2	-1.0	-3.5	-5.1	-8
Central Luzon/Cabanatuan	1962/63	November	3.6	12.2	10.8	9.4	12.9	11.5	20.1	18.7	17.3	25.9	34.5	50
S.W. Mindanao/Cotabato	1962/63	November	-1.3	-2.6	-4.0	-5.3	8.3	62.0	10.7	49.4	23.1	26.8	25.5	29
Western Visayas/Iloilo	1962/63	November	-1.3	-2.7	-4.1	-5.4	3.8	9.8	8.5	15.5	14.2	65.5	53.6	43
						II - Worst Years								
Central Luzon/Manila	1966/67	November	-11.4	-16.4	-14.3	-12.7	-13.9	-15.0	-16.2	-14.6	-13.1	-14.8	-20.2	-20
Central Luzon/Manila	1967/68	December	-1.1	-4.0	-6.3	-7.4	-11.4	-12.5	-13.7	-14.8	-16.0	-17.1	-29.7	-30
Central Luzon/Manila	1968/69	January	-2.8	-5.1	-6.3	-10.3	-11.4	-12.6	-13.7	-14.8	-16.0	-28.6	-29.7	-30
Central Luzon/Cabanatuan	1965/66	November	-10.9	-25.0	-19.8	-23.6	-15.8	-17.1	-24.8	-19.6	-17.5	3.8	-3.9	-10
S.W. Mindanao/Cotabato	1968/69	November	1.8	-3.5	-21.7	-28.2	-26.4	-18.8	-18.8	-21.1	-11.7	-12.9	-14.0	-15
Western Visayas/Iloilo	1967/68	November	-1.2	-19.1	-17.5	-16.0	-18.4	-18.4	-19.6	-23.6	-24.9	-26.1	-19.0	-25

1/ Rate of profit expressed as percent of the base month retail price during the year.
2/ Premium for risk from uncertainty not deducted.
3/ Best years - when traders realized maximum profit from holding.
Worst years - when traders realized maximum losses from holding.
4/ Palay, Macan Ordinario; Rice, Macan 2nd Class.

Sources: Basic prices: See Appendix I.

APPENDIX IV

Traders' Per Annum Yield[1] (after deducting holding costs)[2] from Selling Rice at Retail in City Markets in Selected Years (best and worst)[3] after Holding Palay for Months Indicated after Farm Gate Purchase During Low-Price Month[4]

Farm Region/Retail Market	Year	Month of Purchase \ Months Held Before Selling	1	2	3	4	5	6	7	8	9	10	11	12
						I - Best Years								
Central Luzon/Manila	1963/64	November	-66.4	-16.2	20.4	21.3	13.8	20.4	20.9	30.0	22.6	13.8	-1.7	-8.
Central Luzon/Manila	1963/64	December	36.0	66.6	52.7	35.3	39.5	14.8	45.8	35.3	23.7	5.1	2.1	0.
Central Luzon/Manila	1964/65	January	90.6	55.7	30.8	35.9	32.9	42.6	30.8	18.3	-1.4	-4.2	-5.5	-4.
Central Luzon/Cabanatuan	1962/63	November	43.4	73.0	43.0	28.1	31.1	23.1	34.5	28.1	23.1	31.1	37.6	36.
S.W. Mindanao/Cotabato	1962/63	November	-15.6	-15.8	-15.8	-15.8	20.0	124.1	18.4	74.1	30.8	32.1	27.8	24.
Western Visayas/Iloilo	1962/63	November	-16.1	-16.1	-16.3	-16.3	9.1	19.6	14.5	23.2	18.9	78.6	58.5	41.
						II - Worst Years								
Central Luzon/Manila	1966/67	November	-137.2	-98.2	-57.0	-38.2	-33.3	-30.0	-27.8	-21.9	-17.4	-17.7	-22.1	-20.
Central Luzon/Manila	1967/68	December	-13.7	-23.9	-25.1	-22.2	-27.4	-25.1	-23.5	-22.2	-21.3	-20.5	-32.4	-30.
Central Luzon/Manila	1968/69	January	-34.1	-30.8	-25.1	-30.8	-27.4	-25.1	-23.5	-22.2	-21.3	-34.3	-32.4	-30.
Central Luzon/Cabanatuan	1965/66	November	-130.8	-150.2	-79.3	-70.9	-38.0	-34.2	-42.5	-29.3	-23.3	4.6	-4.3	-14.
S.W. Mindanao/Cotabato	1968/69	November	21.4	-21.0	-86.9	-84.6	-63.4	-37.5	-32.2	-31.7	-15.6	-15.4	-15.3	-15.
Western Visayas/Iloilo	1967/68	November	-14.8	-114.6	-70.2	-47.9	-44.2	-36.8	-33.6	-35.5	-33.2	-31.3	-20.7	-25.

1/ Per Annum Yield in % = Rate of profit (in %) x $\frac{12}{m}$; may not equal due to rounding.
2/ Premium for risk from uncertainty not deducted.
3/ Best years - when traders realized maximum profit from holding.
Worst years - when traders realized maximum losses from holding.
4/ Palay, Macan Ordinario; Rice, Macan 2nd Class.

Sources: Basic prices: See Appendix I.

APPENDIX V

Farmers' Rate of Profit[1] (or Loss) and Per Annum Yield[2] (after deducting holding costs)[3] from Selling Equal Quantities of Palay at Farm Gate or Wholesale Market[4] During Each Year from 1957/8-1967/8, after Holding for Months Indicated after November Harvest[5]

Farm Region/Wholesale Market	Sale Point	Months Held Before Selling 1	2	3	4	5	6	7	8	9	10	11	12	Costs of Holding Include[6]
I - Rate of Profit (in percent)														
Central Luzon/Cabanatuan	Warehouse	-7.6	-7.5	-6.1	-6.2	-5.5	-2.8	-2.5	-1.7	-2.3	-1.3	-5.1	-14.6	all
Central Luzon	Farm	0.0	1.8	1.5	4.2	7.7	6.1	6.4	5.4	0.7	-0.8	-11.8	-17.2	all
Central Luzon	Farm	0.5	2.9	4.1	6.3	15.0	9.2	10.0	11.4	6.9	4.4	-3.1	-11.0	losses & interest
Central Luzon	Farm	1.5	5.6	6.1	10.3	15.2	15.2	17.0	17.5	15.9	14.4	4.9	1.0	losses
S.W. Mindanao/Cotabato	Warehouse	-3.6	2.3	4.5	5.9	9.9	11.3	9.3	-3.1	-11.4	-9.3	-12.4	-17.5	all
II - Per Annum Yield (in percent)														
Central Luzon/Cabanatuan	Warehouse	-91.7	-44.7	-24.2	-18.6	-13.2	-5.6	-6.5	-2.5	-3.0	-1.6	-5.6	-14.6	all
Central Luzon	Farm	0.0	11.0	6.1	12.6	18.4	12.1	10.9	8.1	0.9	-0.9	-12.9	-17.2	all
Central Luzon	Farm	6.1	17.5	16.3	18.8	36.1	18.3	17.1	17.2	9.2	5.3	-3.4	-11.0	losses & interest
Central Luzon	Farm	18.0	33.9	24.4	30.8	36.6	30.3	29.1	26.2	21.2	17.3	5.3	1.0	losses
S.W. Mindanao/Cotabato	Warehouse	-42.8	13.9	18.1	17.7	23.9	22.6	15.9	-4.7	-15.2	-11.2	-13.6	-17.5	all

1/ Rate of profit expressed as a percent of the November palay price from 1957/8 - 1967/8.
2/ Per Annum Yield (in %) = Rate of profit (in %) x $\frac{12}{m}$.; may not equal due to rounding.
3/ Premium for risk from uncertainty not deducted.
4/ Cabanatuan or Cotabato Wholesale Markets.
5/ Palay, Macan Ordinario.
6/ All costs include interest, insurance, storage and losses.

Sources: Basic prices: See Appendix I.

APPENDIX VI

Farmers' Rate of Profit[1] (or Loss) (after deducting holding costs)[2] from Selling Palay at Farm Gate or Wholesale Market[3] in Selected Years (best and worst)[4], after Holding for Month Indicated after November Harvest[5]

Farm Region/ Wholesale Market	Year	Sale Point	Months Held Before Selling: 1	2	3	4	5	6	7	8	9	10	11	12	Costs Holding Incl.
I - Best Years															
Central Luzon/Cabanatuan	1963/64	Whse	0.1	9.1	12.5	14.7	13.4	22.4	23.2	32.6	12.6	15.8	4.2	5.6	all
Central Luzon	1963/64	Farm	0.3	19.0	14.4	18.0	27.4	21.5	30.5	31.7	15.1	8.3	-1.8	-12.3	all
Central Luzon	1963/64	Farm	0.2	20.0	15.9	20.0	29.9	24.5	34.0	35.7	19.6	13.1	3.8	-6.3	losses
Central Luzon	1963/64	Farm	1.2	22.0	18.9	24.0	34.9	30.6	41.0	43.7	28.6	23.3	14.8	5.8	interest losses
W. Mindanao/Cotabato	1966/67	Whse	7.2	12.1	20.7	21.8	25.9	26.7	32.8	20.7	0.9	2.7	2.6	1.8	all
II - Worst Years															
Central Luzon/Cabanatuan	1958/59	Whse	-4.5	-17.2	-29.7	-32.3	-33.9	-34.8	-34.9	-33.8	-34.7	-36.4	-38.2	-40.0	all
Central Luzon	1966/67	Farm	0.6	-5.7	-11.7	-2.0	-8.6	-9.3	-6.2	-11.1	-21.3	-23.8	-29.6	-30.0	all
Central Luzon	1966/67	Farm	1.0	-4.9	-10.6	-0.4	-6.7	-7.0	-3.5	-8.1	-17.9	-20.0	-25.4	-25.4	losses
Central Luzon	1966/67	Farm	2.0	-2.9	-7.6	3.6	-1.7	-1.0	3.5	-0.1	-8.9	-10.0	-14.4	-13.4	interest losses
W. Mindanao/Cotabato	1967/68	Whse	-1.9	-6.1	-12.2	-5.9	-14.8	-2.6	-6.9	-40.8	-43.2	-32.5	-44.3	-45.2	all

1/ Rate of profit expressed as percent of the November palay price during the year.
2/ Premium for risk from uncertainty not deducted.
3/ Cabanatuan or Cotabato Wholesale Markets.
4/ Best years - when traders realized maximum profit from holding.
Worst years - when traders realized maximum losses from holding.
5/ Palay, Macan Ordinario.
6/ All costs include interest, insurance, storage and losses.

Sources: Basic prices: See Appendix I.

APPENDIX VII

Farmers' Per Annum Yield[1] (after deducting holding costs)[2] from Selling Palay at Farm Gate or Wholesale Market[3] in Selected Years (best and worst)[4] after Holding for Months Indicated after November Harvest[5]

Farm Region/ Wholesale Market	Year	Sale Point	Months Held Before Selling 1	2	3	4	5	6	7	8	9	10	11	12	Costs Held Incl
						I - Best Years									
Central Luzon/Cabanatuan	1963/64	Whse	1.0	54.4	50.1	43.9	32.1	44.9	39.8	48.9	16.8	19.0	4.6	5.6	all
Central Luzon	1963/64	Farm	4.0	113.7	57.8	53.8	65.7	43.1	52.2	47.6	20.1	9.9	-1.9	-12.3	all
Central Luzon	1963/64	Farm	2.0	119.7	63.8	59.9	71.7	49.1	58.2	53.6	26.2	15.7	4.1	-6.3	loss inter
Central Luzon	1963/64	Farm	14.0	131.7	76.0	71.9	83.7	61.1	70.3	65.6	38.1	27.9	16.1	5.8	loss
S.W. Mindanao/Cotabato	1966/67	Whse	86.5	72.4	82.8	65.4	62.1	53.4	56.2	31.0	1.2	3.3	2.8	1.8	all
						II - Worst Years									
Central Luzon/Cabanatuan	1958/59	Whse	-53.4	-103.4	-118.6	-97.0	-81.4	-69.5	-59.9	-50.7	-46.2	-43.7	-41.7	-40.0	all
Central Luzon	1966/67	Farm	7.1	-33.9	-46.9	-5.9	-20.6	-18.6	-10.6	-16.7	-28.4	-28.5	-32.2	-30.0	all
Central Luzon	1966/67	Farm	11.4	-29.2	-42.3	-1.2	-16.0	-14.0	-6.0	-12.1	-23.8	-24.0	-27.7	-25.4	loss inter
Central Luzon	1966/67	Farm	23.4	-17.3	-30.3	10.7	-4.0	-2.0	6.0	-0.2	-11.8	-12.0	-15.7	-13.4	loss
S.W. Mindanao/Cotabato	1967/68	Whse	-22.9	-36.8	-48.8	-17.6	-35.4	-5.3	-11.8	-61.2	-57.7	-39.0	-48.3	-45.2	all

1/ Per Annum Yield (in %) = Rate of profit (in %) x $\frac{12}{m}$; may not equal due to rounding.
2/ Premium for risk from uncertainty not deducted.
3/ Cabanatuan or Cotabato Wholesale Markets.
4/ Best years - when traders realized maximum profit from holding.
Worst years - when traders realized maximum losses from holding.
5/ Palay, Macan Ordinario.
6/ All costs include interest, insurance, storage and losses.

Sources: Basic prices: See Appendix I.