Marketable surplus of paddy- a temporal analysis
CHAPTER VI
MARKETABLE SURPLUS OF PADDY - A TEMPORAL ANALYSIS

6.1. Introduction

Public intervention in agriculture marketing in a food deficit country like India arises due to the need for managing public demand effectively by ensuring incentive prices to the producer and fair prices to the consumer. Public intervention in the form of producers/traders levy with or without zonal restriction is an attempt to mobilise marketable surplus at prices lower than market prices. This led to a debate on the disincentive effect of public intervention on production. On one hand it is believed that the producers may not suffer a loss in income as only a small part of total marketable surplus of food-grains is mopped up by way of procurement. This may increase the prevailing open market prices to the extent sufficient enough to compensate for the loss arising from relatively lower procurement prices. ¹ On the other hand it

has also been observed that the procurement prices were not able to cover the average cost of cultivation of certain crops in certain areas.  

Further, lower procurement prices as compared to prevailing market prices definitely imply a tax on the farmer.  

The zoning aspect of procurement policy is found to increase the price dispersion between surplus and deficit states, although it is said to have increased the quantity procured. It has been argued that there are only 'Surplus Farmers' and not 'Surplus States' and such farmers are found even in deficit states. Hence disincentive effect of procurement policy may be more seriously felt by such farmers in surplus states. The

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4 Ibid  

argument that there are no surplus states, is not
a tenable proposition. From social point of view,
to purchase relatively a larger proportion of
marketable surplus of surplus farmers in the
surplus state is not altogether undesirable as it
is these Farmers who have been the major benefi­
ciaries of subsidised inputs like irrigation,
Fertiliser, electricity and subsidised credit, etc.,
besides benefitting from many other developmental
activities. However if the effect of zoning\(^6\) is
too severe on the price of the crop, this could
lead to economic inefficiency by discouraging,
production in surplus areas and encouraging in
deficit areas.\(^7\) Public intervention is considered

\[^6\text{This has no operational significance now as Zoning ceases to exist.}\]

\[^7\text{Surplus states will lose comparative advantage in production due to uneconomic gains. For details, A.M.Khusro "The pricing of Food in India", Quarterly Journal of Economics, 81, 271 to 285, May 1967.}\]
to be transferring income from high income producer to low income consumer. Since low income producers are also made to sell their produce at procurement price, there may be a transfer of income from low income consumer. In case this measure significantly affects the income of low income producer, it may necessarily affect their future production adversely through relatively lesser investment and slower adoption of modern inputs unless compensated otherwise.

Taking the extent of public intervention and the procurement price as given, it is of interest to find out how much of the production is marketed and how it is marketed. Here it would be important to find out factors that affect the extent of marketable surplus. In this context it would be

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desirable to separate the response of marketable surplus to production, given the prices; to prices, given the production. The former is essential to know as to how much marketable surplus can be expected from increased production; while the latter becomes important to know the market response of output to prices.

The discussion on the issue of the response of marketable surplus to prices has taken two extreme opposite views; - i) negative response and ii) positive response. Negative response implies that marketable surplus declines with price increase and vice versa. One explanation for this negative behaviour is the fixed cash demand of the farmers. To realise the fixed cash need, farmers will market less of their produce at higher prices. 9

Another explanation is that increased price will result in increased income to the farmers. This will push up his income demand for consumption, outweighing the substitution effect on production. This has policy implications especially in the case of basic cereal like paddy as it would affect the supply of wage goods for the non-farm sector.

Most of the studies based on time-series data have examined the issues relating to marketable surplus with regard to aggregate of crops. One of the drawbacks of such studies is that raw materials, inferior cereals, superior cereals and commercial crops have been clubbed together and hence individual crop response to different factors could not be known. The importance of such analysis gets reduced for policy purposes.

as developmental programmes are normally initiated with regard to individual crops. It is thus important to know the response of individual crop marketable surplus to production and procurement policy.

The specific aspects to be analysed are:

a) behaviour of marketable surplus overtime and its response to output and prices;

b) the influence of zoning and procurement policy on marketable surplus; and

c) the effect of procurement price on producer's income.

6.2. Paddy Marketing System

Till the setting up of Thanjavur Market committee in 1962 and Food Corporation of India in 1965, paddy dealers and rice mill-owners were the sole purchasers of paddy. They used to pay the farmers mainly in instalments. This used to severely affect the farmer's liquidity for pre-harvest operations of Samba and Thaladi crops. With the co-operative societies entering the market in 1967 and Tamilnadu Civil Supplies
Corporation in 1974, the private whole-sale dealers completely disappeared from the scene. Now, the purchase of paddy is totally in the hands of Tamil Nadu Civil Supplies Corporation, Food Corporation of India, and Co-operative Societies.

The percentage of paddy output procured in different years is presented in Table 6.1 for Kuruvai Season, Samba and Thaladi Seasons and for all the seasons taken together. The quantity of paddy output procured during different years varies between 4.1 per cent in 1971 to 45.81 per cent in 1969. The variation in procurement between

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11 The Food Corporation of India has two major functions in the marketing of paddy and rice - as procurement of paddy from the farmers through the appointed agents and the co-operative societies and by procurement of rice from Millers and Co-operative Societies. It also acts as the district agency for the state government and maintains the account of procurement and despatches.
Table 6.1
Percentage of Paddy Output Procured in different seasons in Thanjavur

<table>
<thead>
<tr>
<th>Year</th>
<th>Kuruvai Actual Procurement</th>
<th>Samba &amp; Thaladi Actual Procurement</th>
<th>Annual Actual Procurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967</td>
<td>54.07</td>
<td>34.14</td>
<td>40.64</td>
</tr>
<tr>
<td>1968</td>
<td>57.92</td>
<td>30.85</td>
<td>39.35</td>
</tr>
<tr>
<td>1969</td>
<td>58.58</td>
<td>39.14</td>
<td>45.81</td>
</tr>
<tr>
<td>1971</td>
<td>4.21</td>
<td>4.10</td>
<td>4.10</td>
</tr>
<tr>
<td>1972</td>
<td>4.62</td>
<td>7.69</td>
<td>6.67</td>
</tr>
<tr>
<td>1973</td>
<td>16.91</td>
<td>7.77</td>
<td>11.16</td>
</tr>
<tr>
<td>1974</td>
<td>30.48</td>
<td>12.09</td>
<td>18.76</td>
</tr>
<tr>
<td>1975</td>
<td>61.45</td>
<td>22.48</td>
<td>35.97</td>
</tr>
<tr>
<td>1976</td>
<td>10.33</td>
<td>49.74</td>
<td>38.49</td>
</tr>
<tr>
<td>1977</td>
<td>N A</td>
<td>N A</td>
<td>15.29</td>
</tr>
<tr>
<td>1978</td>
<td>N A</td>
<td>N A</td>
<td>27.24</td>
</tr>
<tr>
<td>1979</td>
<td>N A</td>
<td>N A</td>
<td>7.18</td>
</tr>
<tr>
<td>All Years</td>
<td>N A</td>
<td>N A</td>
<td>27.27</td>
</tr>
</tbody>
</table>

Source: Actual procurement data has been obtained from District Supply Office, Thanjavur.
years could be explained in terms of vigour of procurement operations. It is also important to note that the percentage of paddy output procured in Kuruvai season has normally been much higher than that of Samba and Thaladi seasons. It is mainly because of the fact that the Kuruvai paddy is not much favoured by the farmers for consumption due to its poor taste and coarse grain and has also poor storage quality as it is harvested during rainy season.

6.3. Procurement Through Levy

Before 1970, the entire marketable surplus of paddy used to be procured by the government after making allowances for the retention by farmers a part of the produce for the payment of wages, seeds, rent etc. From 1970 onwards, the government had partially decontrolled the paddy trade and had been procuring paddy on levy

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12 Prior to 1968 the figures include the area in Arantangi Taluk and other areas now transferred to Pudukottai district.
from the farmers. In about 12 years time (annex Table VI.1) the rate of levy had been changed 14 times. Excepting few intermittent free trade seasons, zonal restrictions on the movement of rice on private trade account have, by and large, been continued. The levy on paddy had been changed from being on quantity moved out to on total purchase by traders and mill owners and to levy on producers.

The system of producers' levy was in vogue during samba and thaladi in 1975. So, as on 1975, the notified levy rates fixed by the government are given in Table 6.2.

It is clear from the table that the percentage of levy to productivity per hectare of paddy\(^{13}\) varied from less than 8 for the holding size below 0.41 hectares to as high as

\(^{13}\) Average productivity in 74-75 was 23.76 quintals of paddy per hectare of cropped area.
Table 6.2.  
Levy Rate per hectare in Thanjavur (1974-75)

<table>
<thead>
<tr>
<th>Extent of holding</th>
<th>Levy rate per hectare in quintals</th>
<th>Levy as percentage of productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Above 0.20 hectares and Upto 0.41 hectares</td>
<td>1.85</td>
<td>7.79</td>
</tr>
<tr>
<td>2. Above 0.41 hectares and Upto 0.81 hectares</td>
<td>8.65</td>
<td>36.41</td>
</tr>
<tr>
<td>3. Above 0.81 hectares and Upto 1.22 hectares</td>
<td>11.12</td>
<td>46.90</td>
</tr>
<tr>
<td>4. Above 1.22 hectares and Upto 2.02 hectares</td>
<td>14.08</td>
<td>59.26</td>
</tr>
<tr>
<td>5. Above 2.02 hectares and Upto 2.83 hectares</td>
<td>17.29</td>
<td>72.77</td>
</tr>
<tr>
<td>6. Above 2.83 hectares</td>
<td>18.53</td>
<td>77.99</td>
</tr>
</tbody>
</table>

Source: Data on levy rate has been obtained from the District supplies office, Thanjavur.
78 for the holding above 2.83 hectares. It may be pertinent to mention here that a holding size of 2.82 hectares could hardly be called a large size farm by any standards, to justify the procurement about 78 per cent of the produce. This shows how regressive has been the producers levy in Thanjavur. As the levy fixed by the government for different size holding does not take into account the familysize, productivity per hectare and seasonal conditions, it may not be improbable that some of the farmers in different size groups might have been put in a difficult situation even to meet their family consumption requirements.

In a situation of monopoly purchase by Tamilnadu Civil Supplies Corporation coupled with zonal restrictions on the movement of paddy from Thanjavur on private trade account (zone within zone), the producers have necessarily to sell their surplus stock to the corporation alone.
6.4. Procurement Price and Cost of cultivation

In view of the above discussion, it may be appropriate to see whether procurement price covers the cost of production. Reliable data on cost of production of paddy are not available for all the years. However, these are available for a few years. The data on the cost of production and price of paddy area presented in Table 6.3.

A cursory look at the table reveals that with the exception of 75-76, in all other years, the procurement price had been lower than the total cost of production in Thanjavur district. The margin of uncovered cost ranges from Rs.8.23 to Rs.23.67 per quintal of rice (paddy). It is therefore clear that the cost of production of rice (paddy) has not been covered by procurement prices of rice (paddy) fixed by the government, although in principle cost of production has been accepted as a guiding consideration for fixing the
It is very important to fix the procurement price at a level which not only covers the total cost of production, but also provides a margin of profit over it. Even then farmers may feel the disincentive effect of procurement price if it happens to be substantially lower than the market price.

14 The Agricultural Prices Commissions objective was clear in its report that the minimum price would cover the 'properly defined' and 'measured' cost of cultivation. It would also keep in mind the suitable cropping pattern and encourage improved agricultural cultivation besides narrowing the inter-state price disparities. Commission itself admits the inroad of adhocism and deficiencies in cost estimates of production. See 'Report of Agricultural Prices Commission on Price Policy for kharif cereals for 1965-66 Season' P.2 May-July 1965, Ibid, P.1 to 9 April 1968. Ibid p.3 May 1963.
Table 6.3.
Comparative picture of procurement price and cost of production of rice in Thanjavur District

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of Production per quintal</th>
<th>Weighted average procurement price per quintal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971-72</td>
<td>97.68</td>
<td>74.01</td>
</tr>
<tr>
<td>1972-73</td>
<td>91.32</td>
<td>75.93</td>
</tr>
<tr>
<td>1973-74</td>
<td>112.44</td>
<td>94.82</td>
</tr>
<tr>
<td>1974-75</td>
<td>128.56</td>
<td>120.33</td>
</tr>
<tr>
<td>1975-76</td>
<td>131.47</td>
<td>143.94</td>
</tr>
<tr>
<td>1976-77</td>
<td>136.12</td>
<td>118.69</td>
</tr>
<tr>
<td>1977-78</td>
<td>139.98</td>
<td>123.23</td>
</tr>
<tr>
<td>1978-79</td>
<td>171.23</td>
<td>159.78</td>
</tr>
</tbody>
</table>

* Cost of Production taken from IAOP cost of cultivation studies.

** including bonus
6.5. Procurement Price and Farm harvest price

The justification for purchasing a part of the marketable surplus at procurement price is that "the weighted average price of levy and non-levy sales is likely to be higher and certainly not less than the price the farmer would have received in the absence of levy."\(^{15}\) With procurement price being less than the cost of production, the other alternative to earn more income is the remunerative non-levy sales price. Generally about three fourth of paddy output is marketed within 10 to 12 weeks of harvest when the prices are low. Hence it would be appropriate to compare the procurement price with farm harvest price.\(^{16}\) As stated earlier upto 1970

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\(^{16}\) The comparison between procurement price and wholesale price, cannot be made, for the wholesale price reported for the State of Tamilnadu is also the controlled price.
and in 1974-75 the entire marketable surplus was purchased at procurement prices. This makes the comparison redundant for those years, as the farmers had no alternative outlet to sell. Upto 1978, the difference between farm harvest and procurement prices has been 17 to 32 per cent (Table 6.4). In the later years especially in 1979 the farm harvest price was lower than the procurement price due to glut in the market.

As Thanjavur district is a surplus paddy producing district, market price in the district could have normally ruled lower than the adjoining districts, even if there were no restrictions on the movement of paddy outside the district. While making the district a separate rice zone within the Tamilnadu state and applying the zonal restrictions strictly, the government had been able to depress paddy prices quite substantially in the district so much so that they became almost equal to the procurement prices fixed by the government which are normally fixed lower than
Table 6.4.

Weighted Average Procurement Price and Farm Harvest Price in Thanjavur

\[
\begin{array}{cccc}
\text{YEAR} & \text{WEIGHTED AVERAGE PROCUREMENT PRICE} & \text{FARM HARVEST PRICE} \\
1964-65 & 59.85 & 67.32 \\
1965-66 & 63.64 & 60.24 \\
1966-67 & 68.18 & 68.41 \\
1967-68 & 68.18 & 73.81 \\
1968-69 & 71.12 & 73.66 \\
1969-70 & 71.12 & 72.21 \\
1970-71 & 72.74 & 90.77 \\
1971-72 & 74.01 & 93.08 \\
1972-73 & 75.93 & 89.71 \\
1973-74 & 94.82 & 117.04 \\
1974-75 & 120.33 & 129.92 \\
1975-76 & 143.94 & 144.94 \\
1976-77 & 118.69 & 156.71 \\
1977-78 & 123.23 & 143.92 \\
1978-79 & 159.78 & 144.79 \\
\end{array}
\]

* Taken from various issues of *Agricultural Situation in Indian* Ministry of Food and Agriculture Government of India

** Weighted by a quantity procured of different varieties of paddy
the ruling market price. It could thus be expected that the procurement policy of the government has an element of disincentiveness to the farmers. In fact, it has already been felt that farmers have been slowly withdrawing area from paddy cultivation. This has been happening inspite of the fact that inputs are being supplied at subsidised rate. In view of the above consideration, it may not be inappropriate to suggest that if present procurement policy is to continue in Thanjavur district in which open market sale of paddy is almost ruled out, procurement prices of paddy in the district should be fixed at a relatively higher level, so that it does not come in the way of the farmers incentive to increase paddy production.

If the paddy cultivation is not profitable, why should its cultivation be continued? The percentage of area under paddy has already shown a distinct declining tendency which may aggrivate further. It may be important to mention that even if paddy cultivation is not profitable because of
the procurement policy of the Government in Thanjavur, its cultivation may still be continued for catering the need of family consumption and kind payments. The practice of giving kind wages in paddy even for the cultivation of other crops continues even now. Besides paddy is the basic cereal consumed both by rich and poor. Even if the marketable surplus of 36.92 per cent of the paddy output is considered as essentially not required, by the producers for the consumption and other needs and to that extent area under paddy crops can be diverted to other crops; producers may still opt to cultivate paddy in the rest of the area to produce 63.08 per cent of the output.  

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17 Marketable surplus has been estimated after allowing the farmers to retain stock for the payment of wages, seeds, etc. The requirement of paddy for seeds and wages was taken on District Civil Supplies standard assumption of 590 kgs of rice per acre and the requirement for personal consumption was reckoned as 398 kgs of rice per adult per year. (as per District Supplies Office, Thanjavur) This works out to 988 kgs of rice per acre.
Other important crops that are grown in the district are sugarcane, ragi and turmeric. When north-east monsoon floods the field, paddy may perform better than these crops, under water-logged conditions. The cyclonic wind in October and November when occurs may destroy the entire sugarcane crop uprooting it. In view of these considerations, paddy turns out to be the most suited crop for cultivation in Thanjavur district.

6.6. Supply response of marketable surplus

The reasoning so far has been that the procurement price has been kept unreasonably low and this might have affected the growth in paddy output. This might happen if the low price leads to less of marketable surplus and thereby less income. This rises another question in regard to factors other than price affecting marketable surplus like output, consumption, family-size and farm-size. Due to non-availability of time-series data on consumption and farm-size, this could not be included in the analysis.  

18 However these are included for the purpose of cross-section analysis.
The response of marketable surplus of paddy to output and price has been examined through regression analysis. The effect of output on marketable surplus has been examined in two parts - i) effect of area and ii) effect of productivity. This has been done because growth of output has mainly come through growth in productivity and hence its separate effect on marketable surplus could be known.

The analysis is based on the time-series data for the period 1964-65 to 1978-79. Log linear regression has been used for the analysis. The function has been specified as follows:

\[
\log \text{MKT} = \log a + b \log y + c \log PH + d \log A
\]

Linear and semi-log-linear regressions were also tried but the results are not presented here as the fit for them was not good and logical.
where

\[ MKT = \text{Marketable Surplus of paddy (quintals)} \]
\[ A = \text{Area under paddy (hectares)} \]
\[ Y = \text{Productivity of paddy per hectare (quintals)} \]
\[ P = \text{Procurement price (Rupees)} \]
\[ H = \text{Farm harvest price (Rupees)} \]
\[ PH = \text{Ratio of levy price to farm harvest price} \]

Marketable surplus has been estimated after allowing the farmers to retain stock for the payment of wages, seeds, etc. The requirement of paddy for seeds and wages was taken on the standard assumption of 590 kilograms of rice per acre and the requirement as for personal consumption was reckoned to the 398 kilograms of rice per adult per year. This works out to 988 kilograms of rice per acre. \( P \) is the weighted average levy price of coarse, medium and fine varieties of paddy; the weight being quantity sold of respective varieties. During certain years, procurement prices were changed more than once. In such cases the weighted average procurement price of such years was worked out by taking quantity of paddy procured
at different procurement prices as weights. The PH variable is included to catch the effect of procurement policy particularly through zonal restrictions on the movement of paddy.

Table 6.5.

Time-series marketable surplus response function (Log Linear)

<table>
<thead>
<tr>
<th>Constant</th>
<th>Regression Coefficients</th>
<th>Standard Error Estimate</th>
<th>D.W.</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>PH</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-4.3696</td>
<td>1.7291</td>
<td>0.2731</td>
<td>0.4765</td>
<td>0.01</td>
</tr>
<tr>
<td>(2.101)</td>
<td>(0.957)</td>
<td>(0.379)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure within brackets denotes 't' value significant at 10 percent level

20 Farm harvest price is not market price in the real sense of the term as they are depressed due to zonal restrictions. Hence farm harvest price and procurement prices do not differ much in some years. But in view of the absence of any other price to represent the market price in the district there was no option but to take available farm harvest price as a proxy for market price.
The results of the regression equations are presented in Table 6.5. The included variables in the equation explain 64 percent of the variations in marketable surplus. In the equations, the elasticity coefficient of yield per hectare is significant while that of area and price is not significant. The elasticity coefficient for the variable $PH^{21}$ representing the effect of quantity procured and that of procurement price on marketable surplus is not significant. These results are not unexpected. As farmers have virtually no option to sell their produce in the open market worth its name and as because of zonal restrictions the difference between procurement and market prices gets greatly narrowed. The price

21 Similar result was obtained by Hayami and others. Please see Zenaida Toquero, Part Duff, Teresa Anden-Lacsina and Yujlo Hayami, "American Journal of Agricultural Economics", 57(A), November, P.707 1975
factor has lost its role of influencing marketable surplus of paddy. The increase in paddy area has been so slow to have any tangible effect on the marketable surplus. It is only the productivity per acre which has been increasing at a good enough rate to influence total output and hence marketable surplus of paddy. It could thus be concluded that the response of marketable surplus to output has been significant in Thanjavur while that of price has not been significant.

Temporal analyses of marketable surplus has shown that influence of productivity on marketable surplus is more significant than price and procurement. In the next chapter along with productivity and price, other issues relating to behaviour of marketable surplus are empirically tested with the cross-section data of the sample house-holds.