Farm-size and marketable surplus - a cross section analysis
7.1. Review of literature

Studies explaining the effect of farm size on the distribution of marketable surplus could be divided into two categories. Studies coming in the first category estimated marketable surplus indirectly on the basis of secondary aggregate data. These studies have derived the required variables for different size of farms under certain assumptions. The studies falling under second category derived the relevant parameters directly from the primary data. These studies are for aggregate of crops as well as for individual crops.

The most celebrated study in the first category was that of Dharam Narain which pertained to the year 1950-51 for All India.\(^1\) The same methodology was adopted by Utsa Patnaik\(^2\) and

---


Ashok Gulati for working out the marketable surplus for the years 1960-61 and 1971-72 respectively.

In all the three studies marketable surplus has been defined as the difference between output and kind expenditure. Kind expenditure includes consumption at source, rent for leased in land, wages, seeds, payments to artisans and animal feed. Though the basic methodology has remained the same in all the three studies, assumptions made have differed to a certain extent. Because of this and the period covered by them, the results also differed.

In 1950-51, the share of small cultivators in total marketed surplus was found to be 46.5 per cent which declined to 33.24 per cent in 1960-61 but shot up again to 45.75 per cent in 1971-72. Medium cultivators have shown an increase in their contribution to total marketed surplus in all the three studies. The share of big cultivators increased in 1960 but declined sharply in 1971-72. The

---

difference across size groups in regard to their contribution to marketed surplus was lower in 1960-61 compared to the other two years.

In 1950-51, the distribution of marketed surplus by size group was bi-modal as it decreased up to the size group of 15 acres but increased thereafter, whereas it was a positive continuum with size in the other two points of time. Utsa Patnaik attributed the bi-modal behaviour to the data source and method of estimation. The difference in result, to her, has mainly arisen because of the treatment of per acre yield figures and consumption of the landless labour besides the high livestock feed percentage. Correcting productivity figure by taking three years average of farm management data and reducing the total feed percentage by nearly 30 per cent and also reducing the total consumption percentage, she re-estimated the marketable surplus for the year 1950-51. This corrected estimation of marketable surplus showed a positive relationship with farm-size. The estimation of marketable surplus for 1971-72 brings out the dominant role of small farmers again. This has been attributed to the increase in the operational area due to sub-division of holdings and leasing in land
as a result of changes in agrarian structure. 4

The dominant role of small farmers as mentioned above 5 can be ascribed on the one hand, to not netting out the re-purchase and, on the other hand, to including the high valued plantation crops in the value of output without knowing the distribution among size classes. 6 It is a common knowledge that small farmers, out of necessity of cash, sell their produce in the immediate post-harvest period and buy back, out of necessity for consumption, at a later stage. This re-purchase which forms a sufficiently high percentage of marketable surplus is not taken into account. Hence, this would automatically show a high percentage contribution by small size group. Moreover, high valued

---

4 Ashok Gulati, Ibid P.39

5 It was also observed in the All India Rural Debt and Investment Survey.

plantation crops are mostly cultivated by big farmers and production data of these crops by size group-wise classification are not available. In that situation, to distribute the value of the output in proportion to the area of the size classes would inflate the contribution of small farmers to the total marketed surplus.

The studies belonging to other category, for example, the micro level studies as mentioned earlier, are either for the aggregate of crops or for individual crops. Caution needs to be exercised in interpreting the results for individual crops as buy back and substitution of one crop for another like high valued crop for low valued crop are involved. Therefore, to bring out the influence of this on marketable surplus, the micro level studies on individual crops are divided into (a) studies confining to commercial crops and (b) studies concentrating on non-commercial crops. The results for all crops show that when the marketable surplus is defined net of re-purchase, it is negative below certain acreage (below 2); insignificantly positive in the range of 2 to 5 acres and it increases with
farm size above 5 acres. When the marketable surplus is not netted out for re-purchase, its relationship with farm-size has been positive. When one crop is a predominant crop, more or less representing a mono crop situation, even after netting out the repurchase, the marketable surplus is positive.

There are three studies whose results could be cited for this and these relate to paddy crop only. A study done in Hooghly district of West Bengal for the years 1971-73 indicates that the marketable surplus is negative up to the farm size of 0.66 hectare, turns marginally positive and remains constant for holding size from 0.66 to 1.98 hectares and increases with size thereafter.

---


Another study for Burdwan district of the same state, based on a slightly different definition, indicates that even the smallest size class does have a positive marketable surplus which increases with the size of farms. But in this study, marketable surplus was not netted out for repurchase.\(^9\)

In Coimbatore District of Tamil Nadu, where paddy is not a very important crop and where cotton and groundnut are grown as important cash crops and jowar as important subsistence crop, the percentage of marketable surplus to total paddy output was found to be as high as 51 per cent.\(^{10}\)

There is another study which relates to both


\(^{10}\) Studies in the Economics of Farm Management - Coimbatore, Report for the year 1971-72.
Marketable surplus in this study has been indirectly estimated. This study again indicates negative marketable surplus up to the farm size of 5 acres and thereafter shows positive relationship with the farm size for the country as a whole. This study also reveals positive relationship in the entire farm size range for Andhra Pradesh, Kerala and Tamil Nadu but negative relationship up to 10 acres for Gujarat and Maharashtra.

A cereal like paddy when grown entirely as a commercial crop, not only the percentage of produce marketed is high but also the difference in the magnitude of marketable surplus across the farm size groups is low. In Punjab, 91 per cent of total paddy output was marketed in the year 1966. Small farmers (below 1 acre) marketed 88 per cent of their produce while the other farmers marketed

---

92 per cent of their produce.\(^{12}\)

A study by the IADP Office on the marketable surplus of paddy in Thanjavur district for the period 1964-66 shows that there is positive relationship between farm size and marketable surplus. The percentage of marketable surplus to the paddy output was found to vary between 24 per cent for the holding size of less than one acre and 85 per cent for the holding size of above 30 acres.\(^{13}\) The foregoing review thus suggests that there is no uniformity in the magnitude of marketable surplus across size groups either for all India or states and either for aggregate of crops or individual crops.

It was clear from the above discussion that the extent of marketable surplus of a crop depends upon the size of holding and purpose for which

\(^{12}\) Ranjit Singh and M.V. George, “Production and Marketed Surplus of Paddy in Punjab”, *Agricultural Situation in India*, May 1969.

it is grown - whether the crop was basically grown as a commercial crop or as a subsistence crop. Therefore, it would be appropriate to confine to individual crops alone to study the behavioural aspect of marketable surplus. This would enhance the utility and would be beneficial to give a meaningful conclusion especially when done at a disaggregated level and for homogeneous crop-region.

Besides, as seen earlier, the behaviour of the marketable surplus of a subsistence crop like bajra or jowar may be different from the behaviour of a high valued crop or a superior cereal like wheat or rice. An individual's consumption out of production of a particular crop would also depend on the nature of the crop, his total income from agriculture as well as from other sources, change in his total income, family size and their marginal propensity to consume. The increase or decrease in consumption with the given increase in production depends upon whether the marginal propensity to consume of that particular crop is greater or lesser than the
proportion of change in income from that crop to change in total income. Because of the heterogeneity one could expect a negative response in some size classes. Further, it may be positive for other size classes. Hence, it would be proper to identify the size acreage below which there is negative response for marketable surplus.

Further, the difference between marketable and marketed surplus though accepted theoretically, has not been followed precisely in practice. The tendency has been to use these two concepts interchangeably. The marketable surplus refers to the quantity that a farmer is capable of marketing whereas marketed surplus is the quantity that is actually marketed. The quantity that the farmer is capable of marketing is determined by his output, expenditure in kind, and consumption. The difference between marketable and marketed surplus arises on account of (a) difference between forward stock and stock out of current production; (b) wastage in storing and unrecorded sales (c) non-accounting of buy backs, kind receipts such as wages, rent, etc.
Buyback should also be taken into account while calculating marketable surplus because marginal and small farmers may sell a part of produce immediately following the harvest necessitated by the urgent requirement for cash. Such sales are referred to as 'distress sales' as later they may purchase, may be larger quantity at a higher price. For these farmers marketable surplus is definitely negative as they have to repurchase to meet their consumption needs. It is also essential to take account the kind receipts. Small farmers may also work as agricultural labourers, and receive their wages in kind and other farmers may receive rent and interest in kind. This also affects the marketable and marketed surplus. When a significant percentage of produce is lost by way of wastage due to humidity, allowances should be made for wastage in storage while working out marketable surplus.

As regards tenancy it may not affect aggregate of marketable surplus at the macro level, for the owner of the land may have either to sell (then it is added to produce marketed) or consume (to the extent that his claim on the marketed produce is less). But at the micro level an analysis by
tenure classification would indicate the variation in marketable surplus in relation to tenants and owner cultivators.

It can also be generally said that this surplus of paddy per acre is not uniform for different size of holdings and is small for small holdings and large for sized holdings. This generalisation is based on the assumption that the requirements for consumption may not change appreciably with the variations in the size of holdings and that the requirements for seeds and payment of wages in kind are likely to change more or less in proportion with the increase or decrease in the size of holdings. The marketable surplus could not, therefore, be correctly estimated without any reference to the size of holdings, the production of paddy in that holding and requirements of the cultivators. Moreover, in the context of the shortage in the supply of paddy and the consequent procurement by the Government the marketable surplus of paddy available with the cultivators for distribution to the consumers, it has become quite necessary to know exactly the amount of surplus the cultivators
with different holdings size would have. In these circumstances, it is obvious that a study on the marketable surplus of paddy for different size holdings might be useful.

The influence of access to market and cost of marketing could not be examined as the district has been under zonal restriction for long and a sizable proportion of marketable surplus has been procured by the government at procurement price irrespective of the distance of the village from the market and the cost of marketing of the paddy.

Alternatively, attempt has been made to study the effect of price on marketable surplus. For this purpose, distinction is made between the quantity sold in open market and the quantity sold in levy and the agency to which it was sold. As the price data were available by individual households the weighted average price of individual house-holds has been taken to represent the price variable. The weight being quantity sold, differences that may arise due to differences in quality of grain is ruled out. The weighted average price is taken because inter-farm differences provide the basic rationale for a cross-section study. These differences
are vital because farmers neither belong to the same economic class nor do they sell at same unit prices.

7.2. Objective and Methodology

So far as this study is concerned it examines the farm-size and marketable surplus relationship in a predominantly rice growing district in South. Relationship between marketable surplus and tenure would also be looked into. To put it more specifically the study intends to examine the following:

I. relationship between farm-size and marketable surplus; and

II. relationship between marketable surplus and tenure.

In this study distinction between marketable and marketed surplus would be made for empirical analysis. With a view to estimating the marketable surplus with the cultivators, their requirements for seeds, payment of wages in kind, family consumption and other expenditure in kind are deducted from the total paddy output and receipts in kind is added by size of holdings. Wages paid in kind refers to the quantity of paddy paid to the
labourers. Customary payments and payments to artisans and other expenditure in kind like seed and animal feed includes the actual quantity of paddy given by individual farmers. Rent denotes the kind rent paid in terms of paddy to the landowners by the cultivating farmers. Consumption refers to quantity of paddy kept apart for domestic consumption for arriving family-size, two children were assumed to make one adult unit.

As per the price variable, the price used for analysis in the chapter is the weighted average price, the weights being quantity of different types of paddy sold to procurement agencies or in the open market.

Marketable surplus has been worked out by two alternative methods: (i) inclusive of rent; and (ii) exclusive of rent. This has been done in order to know the effect of kind rent payment on the marketing capacity of tenant cultivators.
7.3. **Farm-size and Marketable Surplus - Tabular analysis**

Data on kind expenditure on different items by size of holdings for 1969-70 and 1975-76 are presented in table. 7.1. The total kind expenditure per holding in physical terms increased marginally over the five year period for small and medium size farms, but showed a marginal decline in the case of large size farms. For the sample as a whole the total kind expenditure per farm declined from 34.82 quintals in 1969-70 to 33.84 quintals in 1975-76. The total kind expenditure as percentage of paddy output showed a considerable decline for all the three size-group of farms over the period of time. It declined from 35.6 per cent in 1969-70 to 31.15 in 1975-76 for the sample farms. In both the years the share of kind expenditure to output showed a considerable decline with the increase in size of farms. This is largely accounted for by the decline in the share of family consumption across the size-group from about 21 per cent for small farmers to about 6 per cent for the large farms, although
the quantity consumed per family by and large increases with the size of farms. The share of rent in the total output also declines with the size of farms. On the other hand, the share of wages and seed in the output of paddy, by and large increased with the size of farms, but the increase for seed was very marginal. These are quite expected on a priori reasoning.

7.4. Expenditure on seeds

Out of the total production 2.79 per cent of the produce was kept for seed in 1969-70 and in 1975-76 it is 2.30 per cent (table 7.2). The decline in percentage of produce kept as seed has declined significantly in case of small farms from 2.69 to 1.93 per cent. The reason might be that in the case of small farms, they preferred to buy the seedlings of the new varieties to accommodate the changes that have taken place on the varietal front. Besides, due to the smallness of their holdings, it is more economical for them to buy the seedlings
### Table 7.1.

**Expenditure in kind by Farm-size groups in Thanjavur**

1969-70 and 1975-76

<table>
<thead>
<tr>
<th></th>
<th>1969-70</th>
<th>1975-76</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small Farms</strong></td>
<td>20.51</td>
<td>22.28</td>
</tr>
<tr>
<td></td>
<td>(47.20)</td>
<td>(39.75)</td>
</tr>
<tr>
<td><strong>Medium Farms</strong></td>
<td>43.48</td>
<td>44.03</td>
</tr>
<tr>
<td></td>
<td>(36.07)</td>
<td>(31.14)</td>
</tr>
<tr>
<td><strong>Big Farms</strong></td>
<td>59.35</td>
<td>57.20</td>
</tr>
<tr>
<td></td>
<td>(27.17)</td>
<td>(23.57)</td>
</tr>
<tr>
<td><strong>All Farms</strong></td>
<td>34.82</td>
<td>33.84</td>
</tr>
<tr>
<td></td>
<td>(35.67)</td>
<td>(31.15)</td>
</tr>
</tbody>
</table>

**Note:** Figures in brackets denote percentage to total production.
rather than to raise seedlings. This is especially so when there is delay in the release of water. Otherwise, this may also be attributed to the fact that large size holdings provided for higher seed rate per unit of land.

7.5. Consumption of paddy

As could be seen from table 6.2 the 150 cultivating families in 1969-70 set apart 11.26 per cent of the output for consumption. 146 cultivating families in 1975-76 kept 12.01 per cent of output for family consumption. This gives an average consumption of 10.99 quintals per family in 1969-70 and 13.05 quintals at later year. The increase in consumption in later year can be attributed to a slight increase in the family size.

Though quantity-wise the medium and large farms kept 12 to 13.5 quintals in the first point of time and about 15.5 quintals at a later point of time for consumption, in terms of percentage, it is the small
Table 7.2.

Item-wise details of kind expenditure by farm size in Thanjavur
1969-70 and 1975-76

(Quantity in quintals per farm)

<table>
<thead>
<tr>
<th>Category of farm</th>
<th>Wages</th>
<th>Consumption</th>
<th>Seed</th>
<th>Rent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Farms</td>
<td>5.04</td>
<td>4.98</td>
<td>9.20</td>
<td>11.79</td>
</tr>
<tr>
<td></td>
<td>(11.60)</td>
<td>(8.89)</td>
<td>(21.17)</td>
<td>(21.04)</td>
</tr>
<tr>
<td>Medium Farms</td>
<td>20.52</td>
<td>16.65</td>
<td>12.26</td>
<td>15.30</td>
</tr>
<tr>
<td></td>
<td>(17.02)</td>
<td>(11.77)</td>
<td>(10.17)</td>
<td>(10.82)</td>
</tr>
<tr>
<td>Large Farms</td>
<td>34.38</td>
<td>30.55</td>
<td>13.45</td>
<td>15.09</td>
</tr>
<tr>
<td></td>
<td>(15.74)</td>
<td>(12.59)</td>
<td>(6.16)</td>
<td>(6.22)</td>
</tr>
<tr>
<td>All Farms</td>
<td>15.14</td>
<td>12.23</td>
<td>10.99</td>
<td>13.05</td>
</tr>
<tr>
<td></td>
<td>(15.51)</td>
<td>(11.31)</td>
<td>(11.26)</td>
<td>(12.01)</td>
</tr>
</tbody>
</table>

NOTE: Figures in brackets denote percentage to total production
farm is seen to keep as high as 21 per cent of produce for consumption. Whereas in percentage terms it is only about 10 and 6 per cent for medium and large farms, respectively.

7.6. Wages paid in kind

Wages paid in kind in 1969-70 represent 15.51 per cent of the total production. The corresponding figure for 1975-76 is 11.31 per cent. The wages paid in kind in paddy per acre area works out to 200 kilograms in 1969-70 and 174 kilograms in 1975-76. The wages paid in kind per acre has differed only by 13 per cent. The proportion in 1975-76 is observed to be less compared to 1969-70. This is mainly due to the higher productivity of paddy per acre in the later year compared to 1969-70. Aside, it may also be treated as the outcome of an agreement between the cultivators and agricultural labour for increased money wages during the reference year.
7.7. Marketable Surplus of Paddy

The proportion of marketable surplus to the paddy output by farm size and share of individual size-groups in the total marketable surplus for 1969-70 and 1975-76 (exclusive of rent) are presented in Table 7.3. It could be noted from the Table that the extent of marketable surplus seems to have increased over the period of time, for all the size-group holdings, increased from 64.26 per cent in 1969-70 to 68.86 per cent in 1975-76 for the sample as a whole. This increase appears to be mainly due to the decline in the share of kind wages. It also reveals that there is a positive relationship between farm-size and marketable surplus at both the points of time as the share of the marketable surplus increases substantially with the size of farm.

Looking at the share of individual size-group in the total marketable surplus, the table reveals that the share of small farms increased from 17 to 21 per cent and that of large farms declined from 34 to 30 per cent in 1975-76 as compared to 1969-70, whereas it remained constant at about 49 per cent in both the years for the medium size
Table 7.3.

Marketable surplus of Paddy in Thanjavur - 1969-70 and 1975-76

<table>
<thead>
<tr>
<th></th>
<th>Small farm</th>
<th>Medium farm</th>
<th>Large farm</th>
<th>All farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Marketable surplus to total output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Exclusive of rent</td>
<td>1969-70</td>
<td>52.80</td>
<td>63.94</td>
<td>72.83</td>
</tr>
<tr>
<td></td>
<td>1975-76</td>
<td>60.25</td>
<td>68.86</td>
<td>76.43</td>
</tr>
<tr>
<td>b) Inclusive of rent</td>
<td>1969-70</td>
<td>63.34</td>
<td>68.33</td>
<td>73.93</td>
</tr>
<tr>
<td></td>
<td>1975-76</td>
<td>66.14</td>
<td>74.35</td>
<td>77.55</td>
</tr>
<tr>
<td>II Share of size group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) in total output</td>
<td>1969-70</td>
<td>19.68</td>
<td>49.69</td>
<td>30.63</td>
</tr>
<tr>
<td></td>
<td>1975-76</td>
<td>21.99</td>
<td>50.35</td>
<td>27.66</td>
</tr>
<tr>
<td>b) in total cropped area</td>
<td>1969-70</td>
<td>19.78</td>
<td>48.55</td>
<td>31.67</td>
</tr>
<tr>
<td></td>
<td>1975-76</td>
<td>21.34</td>
<td>49.35</td>
<td>29.31</td>
</tr>
<tr>
<td>c) in total marketable surplus</td>
<td>1969-70</td>
<td>17.06</td>
<td>49.14</td>
<td>33.80</td>
</tr>
<tr>
<td></td>
<td>1975-76</td>
<td>20.77</td>
<td>49.47</td>
<td>29.76</td>
</tr>
</tbody>
</table>
farms. This difference could, however, be attributed to slight variations in the extent of land area (because of decline in leased-in area).

Among the factors which determine marketable surplus, some vary with the size of holdings and others do not vary. Because of such variation in some factors like seed requirements and wage payments, marketable surplus per acre may also vary. Even the postulated direct positive relationship between farm size and marketable surplus may get distorted due to lower productivity and high component of kind expenditure at lower size of holdings. Result on this front in the present study reveals that such possibility is confined to few exceptional small size holdings. In these cases, marketable surplus per acre is negative due to either lower yield per acre or higher consumption of paddy compared with other similar holdings. As a general phenomenon, the marketable surplus per acre observed to have maintained an upward trend from 1.89 quintals for the size holdings of 0.6 to 1 acre to 16.13 quintals for the size holdings of above 30 acres.

7.8. Marketed surplus of paddy

With a view to obtaining an understanding
Table 7.4.
Marketed Surplus of Paddy By Size-Groups in Thanjavur

<table>
<thead>
<tr>
<th>Category of farms</th>
<th>1969-70</th>
<th>1975-76</th>
<th>Share of size-groups in total marketed surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1969-70</td>
</tr>
<tr>
<td>Small</td>
<td>34.15</td>
<td>42.11</td>
<td>15.09</td>
</tr>
<tr>
<td>Medium</td>
<td>50.04</td>
<td>56.28</td>
<td>52.58</td>
</tr>
<tr>
<td>Large</td>
<td>50.95</td>
<td>51.31</td>
<td>32.33</td>
</tr>
<tr>
<td>All Farms</td>
<td>47.01</td>
<td>51.58</td>
<td>100.00</td>
</tr>
</tbody>
</table>

(in per cent)
about the phenomenon of marketed surplus by the size of holdings and to compare it with marketable surplus, the percentage of marketed surplus to output by size of holdings and the share of each size-group in total marketed surplus are presented in Table 7.3.

It is clear from Table 7.4. that the percentage of marketed surplus to the paddy output for the sample as a whole increased from 47 in 1969-70 to 52 in 1975-76. Although all three size groups seem to be contributing to this increase in overall marketed surplus, this has mainly come from small and medium size farms. So far as the percentage share of individual size groups in the total marketed surplus is concerned it seems to have increased considerably for small farmers and marginally for medium farmers, but declined considerably for big farmers, over the time period.

A comparison between marketable and marketed surplus indicates that although the farmer has
always been higher than the latter for all the size groups at both the points of time. The increase in marketed surplus has been more than that of marketable surplus for the small and medium size farms whereas it was less than marketable surplus for large farms over years. This indicates that large size farms are retaining relatively a higher proportion of paddy output than their small and medium counterparts in the later years.

7.9. Difference between marketable and marketed surplus

The difference between marketable and marketed is of the magnitude of about 17.25 per cent in both years (table 7.5). The reason for the difference may partly be due to the replenishment of owned stock by the farmers as a contingency and also partly in expectation of higher price in future. The important reason for the gap between marketable and marketed surplus is the retention out of the current production was about 8 per cent in 1969-70 to 5 per cent in 1975-76. At the first point of
### Table 7.5.

**Difference between marketable and marketed surplus and stocks**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of farm</th>
<th>Difference between marketable and marketed surplus</th>
<th>Retention out of current production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small</td>
<td>18.65</td>
<td>18.14</td>
</tr>
<tr>
<td>2</td>
<td>Medium</td>
<td>13.90</td>
<td>12.58</td>
</tr>
<tr>
<td>3</td>
<td>Large</td>
<td>21.88</td>
<td>25.12</td>
</tr>
<tr>
<td>4</td>
<td>All Farms</td>
<td>17.25</td>
<td>17.28</td>
</tr>
</tbody>
</table>
time the proportion was higher on small and medium size farms while it was higher on the large size farms for the second point of time. The difference between marketable and marketed surplus is the highest for the large size farm, followed by small and medium size farms. The other factors which may explain the gap between marketable and marketed surplus are:

(i) unrecorded sales at the village level,
(ii) under-reporting of stock retained by the farmers, and
(iii) larger wastages due to inadequate storage facilities.

An estimation available on wastage of paddy during storing and transportation shows that the wastage can be as high as 7.5 per cent. Taking wastage as 5 per cent and adding it to the retention at both the points of time, difference between marketable surplus and marketed surplus still remains unexplained at the level of 4 per cent in the first year and 7 per cent in the second year.

7.10. Response of marketable surplus - Regression results

The analysis of marketable/marketed surplus by size class of holdings has given a general idea about the potential as well as actual quantity marketed. However, causal relationship could not be established between marketable surplus and variables affecting it. Analysis of such relationship becomes imperative to develop a deeper understanding of the behaviour of marketable surplus. The present section addresses itself to measure the response of marketable surplus to changes in the relevant variables by using regression analysis.

The earlier studies dealing with the marketable surplus function for different regions reveal that there is no uniformity in the functional relationship between farm-size and marketable surplus. In this study, linear, log-linear and quadratic equations were tried. It was observed that linear equation gives a better fit and provides far more meaningful
Results.*

The linear equations have been fitted
with following variables:

\[ \text{MKT} = f(Y, LP) \quad --- \quad I \]
\[ \text{MKT} = f(E, F, PC, OM) \quad --- \quad II \]

where,
\[ \text{MKT} = \text{Marketable surplus (in quintals)} \]
\[ Y = \text{Productivity per hectare (in quintals)} \]
\[ LP = \text{Area under paddy (in hectares)} \]
\[ E = \text{Expenditure in kind (in quintals)} \]
\[ \text{excluding family consumption} \]
\[ F = \text{Family size in adult units (in numbers)} \]
\[ PC = \text{Weighted price of paddy (in Rupees per quintals)} \]
\[ OM = \text{Total paddy output (in quintals)} \]

The regression analyses have been done
for two size-groups of farms and for the
entire sample. As the number of big farmers
is only 18, they have been clubbed with medium

---

* The regression analysis has been done only
for marketable surplus and not for marketed surplus. As marketable surplus has been
worked out on a scientific basis by making
relevant deductions for kind expenditure and
as it is a more relevant concept for measuring
the capacity of farmers to market, it
was thought appropriate to base the regression analysis only on marketable surplus.
farmś, and termed as other farmś for the purpose of regression analysis. Category of small farmś remains in tact.

The regression results for two size group of farms as well as for the sample as a whole estimated by using the farm level observations for the two years under reference are presented in Tables 7.6 and 7.7. The value of $R^2$ turns out to be quite satisfactory in both the equations. The explanatory variable account for 61 per cent to 96 per cent of the variation in marketable surplus. The linearity of the function shows that as output increases marketable surplus increases. It also implies that the marginal propensity to sell is constant over a wide range of output. The negative intercept for the two size groups and for the sample as a whole in both equation I and II denotes that marketable surplus is negative below a certain level of holdings.*

In Table 7.6, the coefficients of productivity and area are positive and significant

---

* It has already been observed that farmers with the holding size of 0.60 hectares do not have marketable surplus and in some cases, it was negative.
Table 7.6.

Relationship between farm-size, productivity and marketable surplus

Paddy Crop — 1969-70 and 1975-76

<table>
<thead>
<tr>
<th></th>
<th>1969-70</th>
<th>1975-76</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant</td>
<td>Y</td>
</tr>
<tr>
<td>Small farms</td>
<td>-1.9707</td>
<td>1.9395 *</td>
</tr>
<tr>
<td></td>
<td>(13.809)</td>
<td>(11.675)</td>
</tr>
<tr>
<td>Others</td>
<td>-2.1240</td>
<td>2.0039 *</td>
</tr>
<tr>
<td></td>
<td>(11.717)</td>
<td>(9.830)</td>
</tr>
<tr>
<td>All farms</td>
<td>-1.9598</td>
<td>1.9258 *</td>
</tr>
<tr>
<td></td>
<td>(18.647)</td>
<td>(23.220)</td>
</tr>
</tbody>
</table>

* Significant at 1 per cent level
Table 7.7

Farm Production Function - Marketable Surplus
1969-70 and 1975-76

<table>
<thead>
<tr>
<th>Category of farm</th>
<th>Constant</th>
<th>Family size</th>
<th>Expenditure in kind</th>
<th>Price</th>
<th>Production</th>
<th>$R$</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1969-70</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>- 2.2338</td>
<td>- 0.0322</td>
<td>- 0.9886**</td>
<td>2.5907*</td>
<td>1.3148**</td>
<td>0.86</td>
<td>10.5500</td>
</tr>
<tr>
<td></td>
<td>(0.425)</td>
<td>(0.190)</td>
<td>(4.287)</td>
<td>(3.190)</td>
<td>(11.261)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>1.4296</td>
<td>- 0.4007</td>
<td>- 0.9191**</td>
<td>0.0801</td>
<td>0.9638**</td>
<td>0.99</td>
<td>7.8682</td>
</tr>
<tr>
<td></td>
<td>(0.159)</td>
<td>(0.615)</td>
<td>(7.515)</td>
<td>(0.623)</td>
<td>(42.264)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All farms</td>
<td>- 2.3950</td>
<td>0.2016</td>
<td>- 0.8154**</td>
<td>0.0911</td>
<td>0.9231**</td>
<td>0.99</td>
<td>9.0002</td>
</tr>
<tr>
<td></td>
<td>(0.625)</td>
<td>(0.661)</td>
<td>(18.628)</td>
<td>(1.381)</td>
<td>(66.405)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>1975-76</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>- 5.2604</td>
<td>- 0.2285</td>
<td>- 0.8265**</td>
<td>0.1471</td>
<td>0.9371**</td>
<td>0.99</td>
<td>8.5876</td>
</tr>
<tr>
<td></td>
<td>(0.740)</td>
<td>(0.628)</td>
<td>(13.917)</td>
<td>(1.536)</td>
<td>(43.414)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>- 1.1547</td>
<td>- 0.0152</td>
<td>- 0.9072**</td>
<td>0.0418</td>
<td>0.9718**</td>
<td>0.99</td>
<td>11.6200</td>
</tr>
<tr>
<td></td>
<td>(0.048)</td>
<td>(0.331)</td>
<td>(11.477)</td>
<td>(0.197)</td>
<td>(61.622)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All farms</td>
<td>- 2.89442</td>
<td>- 0.0182</td>
<td>- 0.9231**</td>
<td>0.0396</td>
<td>0.9636**</td>
<td>0.99</td>
<td>10.6200</td>
</tr>
<tr>
<td></td>
<td>(0.210)</td>
<td>(1.392)</td>
<td>(16.418)</td>
<td>(0.321)</td>
<td>(73.788)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 5 per cent level

** Significant at 1 per cent level
for all the three categories of farms in both
the years. This means that increase in
productivity and area results in an increase
in marketable surplus. The response of marketable
surplus to productivity seems to be relatively
higher than that of area on other farms and
vice-versa on the small farms. The magnitude
of the coefficients of both the variables are
higher on other farms as compared to small farms,
indicating a lower response of marketable surplus
to output on the latter group of farms. Thus,
the relationship between marketable surplus
and farm size, and between marketable surplus
and productivity of paddy is positive and
significant.

It is clear from Table 7.7 that the
regression coefficient of kind expenditure is
negative and significant and that of paddy output
is positive and significant for both the size
groups in both the years. Further, the magnitude
of the coefficient of kind expenditure declines
with the farm size and that of output increases
with the farm size. These are quite expected
on apriori reasoning. None of the coefficients
of family size is significant. This is because
size of family shows only a small difference across the sample holdings (Annex Table VII.1).

The coefficient of price is also not significant in any equation except the one for small farms in the year 1975-76. The non-significance of price coefficient is also quite expected in the case of paddy in Thanjavur district, as the major part of the marketable surplus is marketed at procurement price and hence the difference in price across the sample farms is quite small.