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# INCOME, SAVINGS AND INVESTMENT BEHAVIOUR OF SMALL FARMERS*

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The social accounting framework and the macro theory of income determination which is cast in this conceptual framework have been formalised mainly in the context of developed market economies. This has led to a general presumption that neither the accounting framework nor the functional relationships in the literature have any relevance in the context of peasant economic system.[1] In particular, in the Indian situation, it is believed that the macro-economic behaviour of small farmers, as a social category, cannot be analysed in terms of the existing theory and its underlying accounting framework. Recently, attempts have even been made to develop an alternative system of relations and accounting procedure for the Indian small farmers.[2]

While we would go a long way in agreeing with the foregoing hypothesis, it is our contention that for those small farmers who have been absorbed into the domain of the modern, monetized, market sector of a dual economy, this 'invalidity' hypothesis is invalid. In other words, ours is the falsifiable hypothesis that the aggregative behaviour of small farmers who have been absorbed into the market system of the Indian economy can be analysed in terms of the conventional macro-economic relations and their underlying budgeting framework. If, by using the conventional budgeting techniques, we generate data on income, consumption, savings, investment, etc., for a sample of small farmers and these variables fail to manifest statistically significant macro-relations of the conventional type, our hypothesis would be falsified.

## The Data

In the present study, we have used a sample of 87 small farmers from four villages of Tasgaon taluka in Sangli district of Maharashtra. In this taluka, a pilot project, "Integrated Area Development Scheme (IAD)" was launched, on May 1, 1965, to help the small farmers and agricultural labourers to raise their standard of living by increasing their productivity and employment. The farmers were selected from the population of small farmers as

1. (*a*) Raymond Firth and B. S. Yamey (Ed.): Capital, Saving and Credit in Peasant Societies, Allen & Unwin, London, 1964; (*b*) A. V. Chayanov: *Organizatsiya Krest 'Yanskogo Khozyaistva* (1925), Translated by D. Thorner, R. E. F. Smith and B. Kerblay: The Theory of Peasant Economy, Irwin, 1966.

2. Ashwani Saith and Ajay Tankha, "Economic Decision-Making of Poor Peasant Household," *Economic and Political Weekly*, Vol. V, Nos. 5, 6 and 7, Annual Number, February, 1972.

identified by the IAD Scheme. The small farmers so identified were grouped into two categories, *viz.*, participants and non-participants. From these two strata a random sample of 49 participants and 38 non-participants were selected. This was done in order to enable us to observe whether the programme had some influence on the bahaviour of small farmers.

The data refer to the year 1970-71 and for each household in the sample we worked out family budgets giving income and expenditure data by sources. Farm business income (FBI) was calculated by deducting current expenditure on seeds, fertilizers, pesticides, cost of hiring labour and bullock power, interest charges on loans and also land revenue from the gross farm income. The latter included the value, at prevailing prices, of retained as well as marketed crop output and also the income from allied activities such as dairy, goats and poultry.

Net household income (NHI) was arrived at by adding net non-farm income (NFI) to farm business income. In our analysis NHI was taken as the relevant income variable. Household consumption expenditure (HC) included expenditure on food, clothing, light and fuel, education, medicine and usual expenditure on social functions and ceremonies. Expenditures on additions to durable assets, construction of house or non-recurring expenditure on functions like marriages were all excluded as these cannot be considered part of a regular consumption items financed from the annual income stream. Also, the imputed value of farm output retained and consumed was added to consumption since a corresponding element was added to NHI. The residual, NHI minus HC, was taken to be the household savings (S).

*Limitations of the Study*

Using these variables derived from the conventional type of family budget data we attempted a cross-section analysis of the relationship between income, consumption and savings. This was done to test whether these relationships for the small farmers can be meaningfully interpreted in terms of conventional macro-economic functions existing in the literature.

It is important to point out at this stage that the scope of our study was fairly limited. In particular, we would like to note the following limitations:

(*a*) We did not attempt to derive an investment function because the relevant data pertaining to this variable were not available. Meaningful investment functions, whether they emphasize on cost and rates of return as determinants or whether they incorporate the 'accelerator,' must explicitly take account of expectations. This involves the incorporation of time lags and therefore data for several contiguous time periods. Such data, unfortunately, were

not available. In the case of farm investment, therefore, we have restricted the discussion to a description of the magnitude and pattern of investment for different categories of small farmers over a five-year period. Moreover, while examining the magnitude and pattern of farm investment we have taken into account only the investment made for acquisition of farm assets excluding the purchase of land.

(b) The other limitations of our study also arose from the unavailability of time-series data. Thus our application of alternative versions of the savings function has been restricted to cross-section analysis.

(c) Finally, we could not use Friedman's Permanent Income hypothesis[3] at all. Even though his consumption function was, essentially, used in cross-section analysis, it requires time-series data.*

## The Models

The two versions of the aggregate savings function that we have used are those relating to the Keynesian Absolute Income hypothesis and Duesenberry's Relative Income hypothesis. The study, however, should not be interpreted as an evaluation of the alternative hypotheses. As is well-known, for a given body of data on two variables any one of two equations will always fit better than the other. The *better fit, per se, does not imply* the superiority of one theory over the other.[4]

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3. Milton Friedman: A Theory of the Consumption Function, National Bureau of Economic Research, Princeton, 1962.

* His model is the following:

$$Y = Y_p + Y_t \qquad (1.1)$$
$$C = C_p + C_t \qquad (1.2)$$
$$C_p = K \text{ (i.w.u.) } Y_p \qquad (1.3)$$

where $Y$, $Y_t$ and $Y_p$ stand for measured income, transitory income and permanent income respectively.

Similarly $C$, $C_t$ and $C_p$ represent measured consumption, its transitory component and permanent component respectively. The variables i, w, u, represent interest, the wealth-income ratio and the preference pattern which determine the ratio K.

Underlying the consumption function is the assumption that

$$R_{Y_t}, Y_p = R_{C_t}, C_p = R_{Y_t}, C_t = 0$$

where R stands for the coefficient of correlation between the variables denoted in the subscripts. In his version of the consumption function (1.3) where permanent consumption is some proportion of permanent income or

$$\log C_p = \log K \text{ (i, w, u) } + \log Y_t \qquad (1.3)$$

the observed data on both consumption and income have to be split into their transitory and permanent components. Evidently, this could not be done in the absence of time-series data.

4. R. Ferber: A Study of the Aggregate Consumption Functions. Technical Paper No. 8, National Bureau of Economic Research, New York, 1953, p. 25.

As pointed out earlier, our purpose is to verify whether any one or more of the existing theories are meaningful in the context of small farmers in India.

For the Keynesian version of the aggregate savings function we have used the simple model.

$$C_o = \alpha_o + \beta_o . Y \qquad (2.1)$$

$$S_o = Y - C_o \qquad (2.2)$$

$$\text{Hence } S_o = (1 - \beta_o) . Y - \alpha_o \qquad (2.3)$$

where $Y$, $C_o$ and $S_o$ are respectively income, consumption and savings. $\beta_o$ is the marginal propensity to consume, that being positive but less than unity, and $(1 - \beta_o)$ is the marginal propensity to save.

For the Relative Income hypothesis, we have used a modified version of the model used by Duesenberry.[5] In Duesenberry's cross-section analysis, he used savings as the dependent variable and for the independent variable he used percentile rankings of families in a descending income-array of the sample. In our variant we have retained savings as the dependent variable. As our independent variable we have taken the ratios of net household income of the family to the arithmetic mean of net household incomes for the sample. Thus we have :

$$C_1 = \alpha_1 + \beta_1 (Y / \overline{Y}) \qquad (3.1)$$

$$S_1 = Y - C_1 \qquad (3.2)$$

$$S_1 = Y - \alpha_1 - \beta_1 (Y / \overline{Y}) \qquad (3.3)$$

However, the hypothesis underlying both versions is identical. That is to say, both models relate consumption and savings not to the absolute income earned by a household but to the household's relative income position in the income-array of the relevant sample. The psychological theme underlying the models is the well-known Duesenberry "demonstration effect," *i.e.*, that the consumption, savings' habits and aspirations of a household are dependent on the living standards manifested by other households in its environment.

*Results and Discussion*

(*i*) The mean income of those small farmers who did not participate in the IAD Scheme turns out to be Rs. 3,356.20. This is significantly higher than the mean income of participants which is just over Rs. 2,800.

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5. James S. Duesenberry: Income, Saving and the Theory of Consumer Behaviour, Harvard University Press, Cambridge, Mass., 1962.

The difference, however, is not unexpected since those farmers selected for the the Scheme were precisely the weakest sections of the small farmers. Also, it will be seen from Table I that in the case of participants, households operating irrigated farms have a much higher net household income as well as farm business income than that of the unirrigated farms, as is to be expected. In the case of non-participants, however, the net household income of the irrigated farms is less than that of the unirrigated farms, even though their farm business income is more. This phenomenon is attributed to non-farm income, which evidently forms a very important component of household incomes on their farms.

TABLE I—AVERAGE OF INCOME, CONSUMPTION AND SAVINGS FOR DIFFERENT CATEGORIES OF SMALL FARMERS

(Rupees)

|  | Participants in IAD | | Non-participants in IAD | |
|---|---|---|---|---|
|  | Irrigated | Unirrigated | Irrigated | Unirrigated |
| Farm business income | 2,044.48 | 1,479.76 | 2,652.31 | 2,170.00 |
| Non-farm income | 1,186.31 | 648.82 | 670.68 | 1,293.33 |
| Net household income | 3,202.62 | 2,120.58 | 3,323.00 | 3,463.33 |
| Household consumption | 2,692.96 | 1,873.82 | 2,772.00 | 2,973.44 |
| Household savings | 509.66 | 254.76 | 551.00 | 489.89 |
|  | (15.91) | (11.96) | (16.58) | (14.14) |

Figures in parentheses indicate the percentage of household savings to net household income.

Table I further reveals that the average household savings range from Rs. 225 on the participant unirrigated farms to Rs. 551 on the non-participant irrigated farms. In terms of percentage to the NHI, household savings were 11.96 per cent, 14.14 per cent, 15.91 per cent and 16.58 per cent on the participant unirrigated, non-participant unirrigated, participant irrigated and non-participant irrigated farms, respectively. It may again be mentioned here that the average savings represented the excess of net household income over regular household consumption and could be used for acquisition of durable consumption assets, construction of house, repayment of loans or for farm or non-farm investment.

(ii) From our regression analysis we derived the following savings functions, under the alternative hypotheses, for those small farmers who participated in the IAD Scheme.

$$S = 0.3364 Y - 365.225 \qquad R = 0.79$$
$$(9.033) \qquad (1.505) \qquad R^2 = 0.63 \qquad (4.1)$$

$$S = Y - 365.229 - 1798.83 (Y/\bar{Y}) \qquad R = 0.79$$
$$(1.505) \qquad (9.033) \qquad R^2 = 0.63 \qquad (4.2)$$

N.B.: Figures in parentheses denote t-ratios. $R^2$ is the coefficient of explained variation. R is the coefficient of correlation.

It appears that income—either absolute (Equation 4.1) or relative (equation 4.2)—is the single most important determinant of savings and consumption behaviour. As much as 63 per cent of variation in savings is explained by the variation in absolute or relative income. Note also that both the Keynesian as well as the Duesenberry type of savings functions are equally suitable for our data, the correlation coefficient being 0.79 in both cases.

For the small farmers who did not participate in the IAD Scheme our Keynesian and Duesenberry type savings functions turn out to be, respectively :

$$S = 0.4168\,Y - 906.694 \qquad\qquad R = 0.81$$
$$\phantom{S = }(8.483) \qquad (3.330) \qquad\qquad R^2 = 0.66 \qquad (5.1)$$

$$S = Y - 906.696 - 2041.12\,(Y/\bar{Y}) \qquad R = 0.81$$
$$\phantom{S = }(3.330) \qquad (8.483) \qquad\qquad R^2 = 0.66 \qquad (5.2)$$

*N.B.:* Figures in parentheses denote t-ratios. $R^2$ is the coefficient of explained variation. R is the coefficient of correlation.

Once again we note that both variants of the savings function suit our data equally well, the correlation coefficient being as high as 0.81 in both cases. More importantly, we see that for the non-participant small farmers also, income—whether absolute or relative—is the single most important determinant of savings and consumption behaviour. In this case as much as 66 per cent of variation in savings is explained by the variation in net household incomes.

We have seen above that the income variable, derived through conventional budgeting practices, does turn out to be the most important determinant of savings and consumption behaviour for the small farmers. This is consistent with our hypothesis that the conventional theory can meaningfully analyse the behaviour of small farmers who have been drawn into the domain of the modern market sector in a 'dual' economy.

(*iii*) A third significant result emerging from our analysis is the fairly high "marginal propensity to save." These are given by the $(1 - \beta_1)$ co-efficients of the Keynesian savings functions (4.1, 5.1). One must be careful to note that the $\beta_2$ coefficients of the Duesenberry type savings function (4.2, 5.2) are quite distinct from the usual savings or consumption propensities. The marginal propensity to save turns out to be, approximately, 34 per cent and 42 per cent for the participants and non-participants, respectively. These $(1 - \beta_1)$ coefficients are both significant at the 1 per cent level. Therefore, it is to be expected that for every additional rupee income, a household in our small farmers population would tend to save Re. 0.34 in the case of participants and Re. 0.42 in the case of non-participants. The corresponding consumption propensities are approximately 66 per cent and 58 per cent respectively, also significant at the 1 per cent level.

This difference in the marginal propensities is consistent with the Duesenberry hypothesis that people in relatively lower income groups (in this case, the small farmers participating in the IAD Scheme) have a stronger aspiration to raise their standard of living and therefore spend a higher proportion of their incomes on consumption. The alternative Keynesian hypothesis of a constant marginal propensity to save is not consistent with our data.

*Farm Investment*

As pointed out earlier, we did not have the necessary data on explanatory variables to derive an investment function. However, a tabular description of the changing magnitude and pattern of farm investment over time is given in Tables II and III for different categories of our sample of small farmers.

TABLE II—MAGNITUDE OF FARM INVESTMENT ON SMALL FARMS

*(Rupees)*

| | | IAD participants | | | | IAD non-participants | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Irrigated | | Unirrigated | | Irrigated | | Unirrigated | |
| | | Per farm | Per acre | Per farm | Per acre | Per farm | Per acre | Per farm | Per acre |
| 1965-66 | .. | 94.75 | 23.68 | 30.17 | 7.90 | 35.58 | 9.64 | — | — |
| 1966-67 | .. | 206.15 | 51.53 | 230.53 | 60.29 | 464.00 | 125.75 | 319.33 | 84.52 |
| 1967-68 | .. | 309.46 | 77.36 | 181.70 | 47.52 | 446.55 | 121.02 | 375.75 | 99.41 |
| 1968-69 | .. | 398.56 | 99.64 | 98.52 | 25.76 | 412.68 | 111.85 | 102.11 | 27.03 |
| 1969-70 | .. | 166.10 | 41.52 | 95.75 | 25.04 | 221.44 | 60.01 | 329.44 | 87.20 |
| 1970-71 | .. | 451.81 | 112.95 | 260.29 | 68.07 | 37.24 | 10.10 | 352.88 | 93.41 |
| Average | .. | 271.13 | 67.78 | 149.49 | 39.09 | 269.58 | 73.06 | 246.55 | 65.26 |

(*i*) In the case of all categories there seems to have been a sudden increase in investment after 1965-66—when the IAD Scheme was initiated. This is also true of the non-participants, but for the non-participants operating unirrigated farms the data for the initial period are missing (see Table II). For the small farmers participating in the Scheme the volume of investment per farm increased several fold, *viz.*, from Rs. 94.75 in 1965-66 to Rs. 451.81 in 1970-71 for those operating irrigated farms and from Rs. 30.17 to Rs. 260.29 over the same period for those operating dry farms. In neither case, however, was the increase monotonic. The investment per acre of cultivated land shows a similar trend and ranges from Rs. 23.68 per acre in 1965-66 to Rs. 112.95 per acre in 1970-71 on the participant irrigated farms and from Rs. 7.90 to Rs. 260.29 per acre on the unirrigated farms. For the non-participant small farmers operating dry farms the investment per farm was fairly stable—ranging from Rs. 319.33 to Rs. 375.55 per farm. However, there was an exception in 1968-69 when it fell to Rs. 102.11 per farm. The investment per acre of cultivated land ranged from Rs. 27.03 in 1968-69

to Rs. 99.41 in 1967-68. One peculiar phenomenon was that for the non-participants operating irrigated farms—after the initial jump to Rs. 125.75 per acre—the investment declined monotonically to as little as Rs. 10.10 per acre, which is just above the 1965-66 floor.

TABLE III—INVESTMENT PATTERN OF SMALL FARMERS

(Rupees)

| Sr. No. | Particulars | IAD participants | | IAD non-participants | |
|---|---|---|---|---|---|
| | | Irrigated | Unirrigated | Irrigated | Unirrigated |
| 1. | Land improvement measures .. .. | 30,180 (52.11) | 5,570 (31.28) | 12,750 (27.98) | 4,250 (32.00) |
| 2. | Construction of wells and repairs of old wells .. .. .. .. .. | 1,600 (2.76) | — — | 10,550 (23.15) | 3,000 (22.58) |
| 3. | Farm building, cattle shed, etc. .. .. | 5 (0.01) | — | — | — |
| 4. | Agricultural tools and machinery .. | 1,480 (2.56) | 746 (4.19) | 1,931 (4.24) | 453 (3.41) |
| 5. | Livestock .. .. .. .. .. | 24,643 (42.56) | 11,492 (64.53) | 20,336 (44.63) | 5,581 (42.01) |
| | Total .. .. .. .. .. | 57,908 (100.00) | 17,808 (100.00) | 45,567 (100.00) | 13,284 (100.00) |

Figures in parentheses are percentages to the total investment in each category.

(ii) The pattern of investment over the whole period of 1965-66 to 1970-71 shows that livestock has been the dominant component as evident from Table III. The share of investment allocated to livestock ranged from 64.53 per cent for the participants operating dry farms to a minimum of 42.9 per cent for the non-participants operating dry farms. It appears that the small farmers invest relatively more on the purchase of milch cattle in order to supplement their incomes.

The other major component of investment was land improvement, claiming a little less than a third of the total investment in most cases and more than half in the case of participants operating irrigated farms. The investment on agricultural tools and machinery was around a modest 4 per cent and there was almost no investment on construction of farm buildings, cattle sheds, etc. (Table III).

(iii) Finally, it will be noted that investment on construction and re-pairing of wells claimed more than 20 per cent of the total investment for the non-participants, but it was negligible in the case of small farmers participating in the IAD Scheme (Table III). This is because the weakest section of small farmers, who were selected for the IAD Scheme, have so far been extended the facilities of community wells constructed by the Scheme, whereas the same facility had to be provided by the other small farmers from their own resources.