AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

# BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY

1. SUBJECT CLASSIFICATION

A. PRIMARY
Agriculture

AE10-0000-G514

B. SECONDARY
Agricultural economics--Brazil

2. TITLE AND SUBTITLE
Consumption,investment behavior,and savings potential in rural areas of Brazil, 1965-1969

3. AUTHOR(S)
Rask,Norman; Denney,E.W.

4. DOCUMENT DATE
1971

5. NUMBER OF PAGES
8p.

6. ARC NUMBER
ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS
Ohio State

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*
(In Research notes on agr.capital formation and technological change no.6)

9. ABSTRACT

10. CONTROL NUMBER
PN-RAA-393

11. PRICE OF DOCUMENT

12. DESCRIPTORS
Brazil
Consumer expenditures
Investments
Savings

13. PROJECT NUMBER

14. CONTRACT NUMBER
CSD-2501 Res.

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

RESEARCH NOTES ON AGRICULTURAL CAPITAL FORMATION
AND TECHNOLOGICAL CHANGE

The Ohio State University
ESALQ/University of Sao Paulo

Researchers: Norman Rask and
E. Wayne Denney
Date: April 30, 1971
Location: Columbus, Ohio

No. 6
Subject: Rural Savings - Brazil

Tentative Title: "Consumption - Investment Behavior and Savings Potential in Rural Areas of Brazil -- 1965 - 1969."

Tentative Completion Date: October, 1971

These notes report on preliminary findings of a continuing research project. The data and conclusions are tentative and formal reference to them should be cleared with the authors.

## I - Objective -

The main purpose of this study is to investigate the savings potential being generated on selected farms in Southern Brazil. The central hypothesis is that the introduction of new and profitable technologies has dramatically changed the savings-investment picture on farms in Southern Brazil. With an expected lag in consumption response, the increased income generated from the employment of new technology can serve as a pool of surplus capital to fuel further expansion in the productive capacity of agriculture. The specific objectives are:

1) To determine the functional relationship between consumption and income for farms of various sizes,

2) To describe the investment patterns of farms at different income levels, and

3) To measure the potential for rural savings both internal and external to the farm.

## II - Data Source

The data is drawn from two sets of farm-level surveys carried out in several farming regions of Southern Brazil. This area has experienced a revolution in the use of many forms of modern technology during the past decade. The farm-level data was collected for the calendar years 1965 and 1969 in the southern two states of Rio Grande do Sul and Santa Catarina. Approximately 1/3 of the observations are from the same farms in both time periods. The present research note reports on the analysis of 821 farm records from the 1965 data.[1/]

## III - Data Organization

Cross-sectional income data are subject to a certain degree of uncontrollable annual fluctuations. This is especially true in agriculture when farmers face uncertain natural and economic environments. On the other hand, consumption expenditures tend to change more slowly and are less responsive to temporary increases or decreases in the income stream. To control as much as possible for these annual variations in income, two methods of data organization were employed. First, farms were arrayed according to asset levels, on the assumption that asset level was the best proxy for permanent or long-term income-producing capability. In turn, the farms were divided into 11 groups in ascending order based on asset level. Average income, consumption, invest-

1/ For a detailed description of the farming regions and survey methods employed, see Norman Rask, Analysis of Capital Formation and Utilization in Less Developed Countries, Economics and Sociology Paper No. 4. Department of Agricultural Economics and Rural Sociology, the Ohio State University, December, 1969.

ment and savings figures were then calculated for each group. This procedure guaranteed that high permanent income individuals with temporary low income levels would not appear in a lower category and thus unduly distort the expenditure and consumption levels for low income groups.[2/]

Five financial flow variables were considered in the analysis. They are:

1.) Net Cash Income - The total cash received by the farm operation from all sources minus the cash operating expenses experienced during the year of record.

2.) Consumption Expenditures - The total family cash outlays for food, clothing, durable goods, travel, health, recreation, and other normal family expenses.

3.) Capital Replacement Expenditures, and

4.) New Capital Investments - In order to maintain the income producing capabilities of the farm operation, depreciable capital items have to be periodically replaced. To increase the income potential, new capital items are often added to the farm operation. It is impossible in annual data to determine which capital purchases are for maintenance of existing capital stock and which are for additions to the capital base. Therefore, a value for capital maintenance was estimated and subtracted from total capital purchases, and the remainder was called new capital investment.

---

2/ A preliminary consumption function analysis indicated that the permanent income hypothesis was operative (i.e.) farms with very low incomes were experiencing higher than normal consumption levels and those with very high incomes were experiencing lower than normal consumption levels.

5.) Net Credit Flow - the difference between total new credit received during the year, and principle repayments made on existing debts.

Savings capacity may be defined in several ways. Three are used in this analysis. The first, savings potential relates to that amount of income which is left after consumption and capital maintenance expenditures have been accounted for. The second level, residual savings represents that savings which exists above on-farm investments (this amount would be available for mobilization in rural areas.) The final savings value incorporates the net credit flow. Each of the cash flow values for the various farm groupings and the calculated savings residuals is entered in Table I.

IV - Preliminary Findings

1. Farmers in the first two asset groups, approximately one-fourth of the total interviewed, experienced income levels less than or just equal to necessary capital maintenance and consumption expenditures.

2. New capital investments were positive for all groups indicating that on the average, farmers at all levels were increasing their net capital position.

3. Residual savings available for mobilization outside the farm operation, (income left over after consumption and new investment expenditures had been accounted for) were either negligible or negative in all categories. Further, the net credit flow was positive for all farm groups. This would indicate that on-farm investments opportunities, whether financed out of savings or credit, were more profitable than non-farm alternatives. Preferential "negative" real interest rates for

TABLE I

MEAN VALUES OF CONSUMPTION, NET CASH INCOME, NEW INVESTMENT, SAVINGS POTENTIAL, NET CREDIT FLOW AND ESTIMATED CAPITAL REPLACEMENT AT VARIOUS ASSET LEVELS, 821 FARMS, SOUTHERN BRAZIL, 1965

| Asset Level | Number of Observations | Net Cash Income | Family Consumption | Esti. Capital replacement | Savings Potential | New Capital Investment | Residual Savings | Net Credit Flow | Residual Savings plus Net Credit Flow |
|---|---|---|---|---|---|---|---|---|---|
| Less than NCr $4000 | 101 | 427 | 433 | 50 | -56 | 96 | -152 | 48 | -104 |
| NCr $4,000-5,999 | 101 | 597 | 523 | 50 | 24 | 190 | -166 | 63 | -103 |
| NCr $6,000-7,999 | 115 | 774 | 624 | 50 | 100 | 277 | -177 | 83 | -94 |
| NCr $8,000-12,999 | 168 | 889 | 666 | 70 | 153 | 296 | -143 | 66 | -77 |
| NCr $13,000-24,999 | 163 | 1338 | 875 | 90 | 373 | 504 | -131 | 245 | 114 |
| NCr $25,000-34,999 | 38 | 2366 | 1087 | 160 | 1119 | 1159 | - 40 | 420 | 380 |
| NCr $35,000-49,999 | 25 | 2717 | 1422 | 400 | 895 | 526 | 369 | 1703 | 2072 |
| NCr $50,000-69,999 | 29 | 3192 | 1735 | 630 | 827 | 1215 | -388 | 3526 | 3138 |
| NCr $70,000-109,000 | 27 | 8437 | 2045 | 950 | 5442 | 6630 | -1188 | 2514 | 1326 |
| NCr $110,000-269,000 | 27 | 16546 | 4249 | 1700 | 10597 | 8783 | 1814 | 7390 | 9204 |
| Above NCr $270,000 | 27 | 23592 | 5942 | 3000 | 14650 | 17931 | -3281 | 3862 | 581 |

SOURCE: 1965 interviews

agricultural credit on many farms, high rates of inflation existing during 1965 and low institutional interest rates on savings deposits would substantiate this observed investment behavior of the farmers.

4. Sixty percent of the farm operators (all in the lower asset groups) were experiencing a negative cash savings position even when net credit flow was considered.

## V - Conclusions

As income increases, the observed relationship between income and consumption, investment and savings changes from a definite negative position at low income levels to a positive position at high income levels. For policy consideration, four stages in this progression can be identified. The percentage of farmers in the sample, falling in each stage are estimated.

| | | |
|---|---|---|
| Stage I - | Income is not sufficient to meet annual consumption expenditures and thus decapitalization and/or savings must be used to maintain consumption. | 15 percent |
| Stage II - | Income sufficient to meet consumption needs but not maintain capital stock | 10 percent |
| Stage III - | Income sufficient to meet consumption needs, maintain capital stock, and provide additional funds for on-farm investments | 60 percent |
| Stage IV - | Those with savings capacity in excess of on-farm investments | 15 percent |

Given the economic conditions facing farmers in 1965, only 15 percent were generating savings in excess of on-farm investment needs. However, since these are the larger farms, the amount of total agricultural income represented by this group is considerably greater. Growth between

1965 and 1969, is expected to show an increase in the number of farms in stage IV. The absolute cruzeiro level at which each stage changes to the next higher is estimated. This information is noted below and on Figure I.

| Point at which Income is Equal to | Location on Figure I. | Estimated Income Level |
|---|---|---|
| Consumption | A' | NCr $ 500 |
| Consumption + Capital Maintenance | B' | NCr $ 600 |
| Consumption + Capital + on-farm investment | C | NCr $ 30,000 |

## VI - Future Research

Alternative groupings of data will be attempted to further define the income-consumption-savings relationship on these farms in southern Brazil. In addition, the analysis will be replicated using farm-level data from the same area, collected in 1969 to test these relationships and further refine the estimates. The year 1969 presented a somewhat different economic environment for these farmers, in terms of rates of inflation, investment alternatives and credit availability.

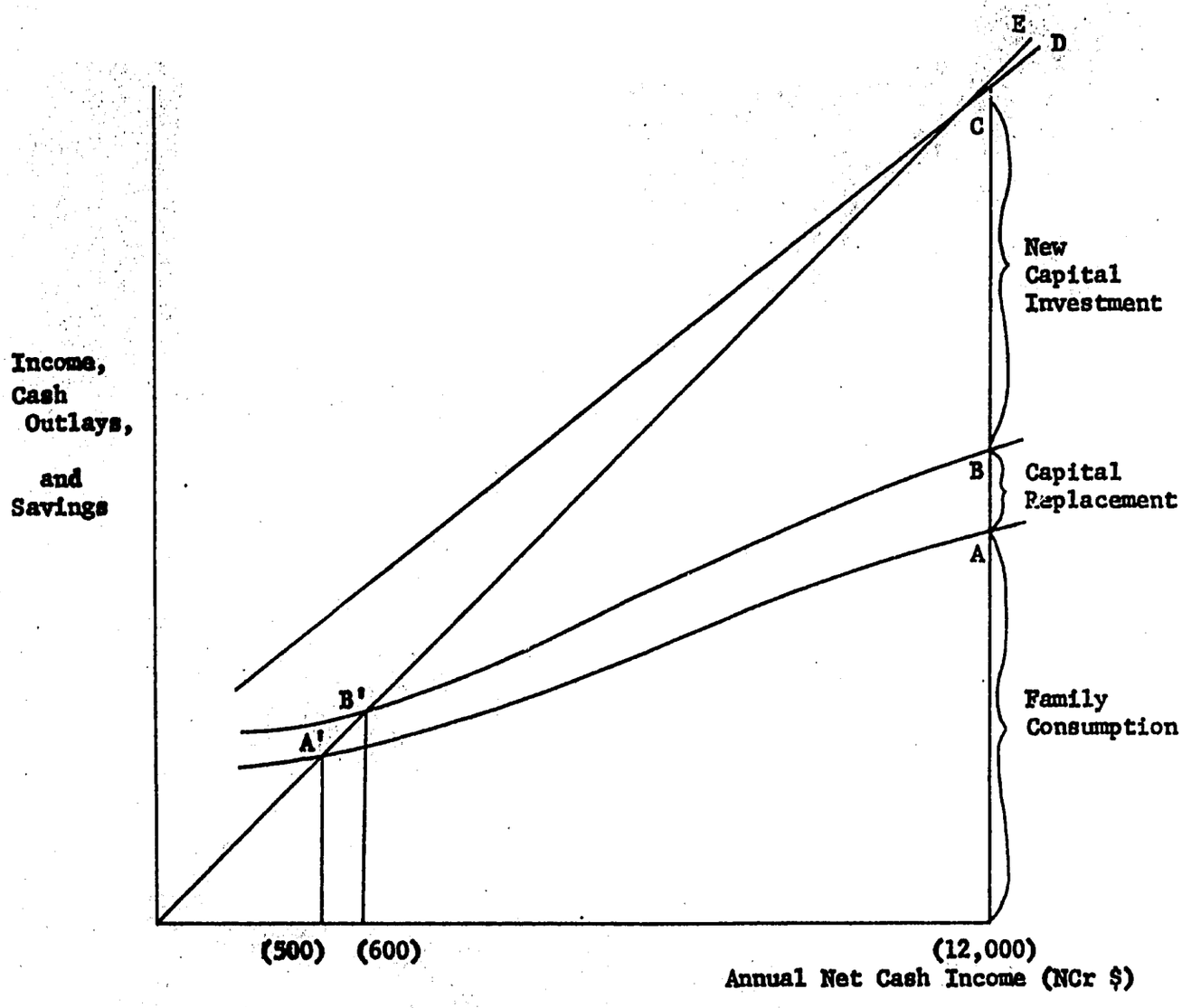


Fig. 1. -- Summary illustration of savings potential on farms in southern Brazil - 1965.

Where:

AX = Family Consumption Expenditures
AB = Replacement Cost to Maintain Existing Capital Stock
BC = Net New Capital Investment
AC = Total Capital Investment
D = Capital Investment Line
E = Income Line