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DATA APPENDIX ANALYSING THE RESULTS FOR THE R.L.P. MODEL OF AGRICULTURAL DEVELOPMENT IN THE WHEAT REGION OF SOUTHERN BRAZIL (1960-1970): REGIONAL RESOURCE USE, FACTOR PROPORTIONS, AND PRODUCTIVITIES BY FARM SIZE

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by
Choong Yong Ahn and Inderjit Singh

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~~The purpose of this~~ The data appendix ~~is to~~ reports ~~systematically~~ some of the initial results of a recursive programming model developed for the wheat regions of Southern Brazil in order to explain the dynamic path of agricultural transformation ~~that has characterized them~~ between 1960 and 1970. The detailed structure of the model, which utilizes a decomposition procedure to trace the differential time paths of development of different farm sizes and its estimation procedures, have been reported previously.

Regional results for three farm size groups analyzed in the model are presented in six sections: ~~A) Regional Resource Use,~~ B) Factor Productivities, C) Factor Proportions, D) Credit Use, E) Income Distribution, and F) Exogenous Data Used in the Model. At the beginning of each section the definitions and symbols used in the tables are explained. ~~Whenever necessary,~~ Additional computation procedures are described ~~in order~~ to clarify the content of the tables.

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Introduction

The purpose of this data appendix is to report systematically some of the initial results of a recursive programming model developed for the wheat regions of Southern Brazil in order to explain the dynamic path of agricultural transformation that has characterized them between 1960 and 1970. The detailed structure of the model which utilizes a decomposition proceedure to trace the differential time paths of development of different farm sizes and its estimation proceedures have been reported previously.*

Regional results for three farm size groups analyzed in the model are presented in six sections: A) Regional Resource Use, B) Factor Productivities, C) Factor Proportions, D) Credit Use, E) Income Distribution, and F) Exogenous Data Used in the Model. At the beginning of each section the definitions and symbols used in the tables are explained. Whenever necessary, additional computation proceedures are described in order to clarify the content of the tables.

It is important to note that the current results employ exogenous variables in the model that involve historical factor and product prices

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* See, C. Y. Ahn, "A Recursive Programming Model of Agricultural Development with Farm Size Decomposition: A Case Study of Southern Brazil (1960-1970)," Occasional Paper #44, Department of Agricultural Economics and Rural Sociology, The Ohio State University, 1971.

and policy programs that were in effect in Southern Brazil during the last decade.** The model therefore attempts to simulate the actual economic history of the region in order to analyze explicitly and quantitatively the main characteristics of its process of transformation. These results are therefore to be distinguished from simulation results we have also obtained from the identical model structure using alternative factor and product prices and policy programs in order to analyze various policy issues. These alternative comparative dynamic results will be reported elsewhere.

** For a description of the actual pricing and credit programs in effect in Southern Brazil in this period, see, Norman Rask, "Analysis of Capital Formation and Utilization in Less Developed Countries," Occasional Paper #4, Studies in Agricultural Capital and Technology, Department of Agricultural Economics and Rural Sociology, The Ohio State University, 1969.

A. REGIONAL RESOURCE USE

1) Land Use

2) Labor Employment

3) Capital Utilization

a) Capital Stock

b) Farm Power Use

c) Investment

d) Total Cash Expenditures

e) Credit Use

SYMBOLS AND DEFINITIONS USED:

WHEAT1: Hectarage sown to wheat adopting draft animal technology
WHEAT2: Hectarage sown to wheat adopting tractor technology
SOYBW1: Hectarage sown to soybean following wheat adopting draft animal technology
SOYBW2: Hectarage sown to soybean following wheat adopting tractor technology
SOYBI1: Hectarage sown to soybean independent of wheat adopting draft animal technology
SOYBI2: Hectarage sown to soybean independent of wheat adopting tractor technology
CORN1: Hectarage sown to corn adopting draft animal technology
CORN2: Hectarage sown to corn adopting tractor technology
NATPAS: Hectarage used for natural pasture
SUPAS1: Hectarage sown to summer-improved pasture adopting draft animal technology
SUPAS2: Hectarage sown to summer-improved pasture adopting tractor technology
WIPAS1: Hectarage sown to winter-improved pasture adopting draft animal technology
WIPAS2: Hectarage sown to winter-improved pasture adopting tractor technology

WHEAT = WHEAT1 + WHEAT2
SOYBN = SOYBN1 + WOYBN2 + SOYBI1 + SOYBI2
CORN = CORN1 + CORN2
NAPAS = NATPAS
SUPAS = SUPAS1 + SUPAS2
WIPAS = WIPAS1 + WIPAS2
SMALL FARM = Small farms with 0~50 hectares
MEDIUM FARM = Medium farms with 51~300 hectares
LARGE FARM = Large farms with above 300 hectares

Remarks: a) Both summer pasture and winter pasture are improved pasture systems which require the tasks of land preparation, seeding, and fertilizing.

b) In Table A7, the hectarages for double cropping activities, i.e. wheat and soybeans following wheat are explicitely accounted for in computing total land use.

TABLE A1: REGIONAL LAND USE BY FARM SIZE AND TECHNOLOGY: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	WHEAT1	WHEAT2	SOYBW1	SOYBW2	SOYB11	SOYB12	CORN1	CORN2	NATPAS	SUPAS1	SUPAS2	WTPAS1	WTPAS2
LAND USE ON SMALL FARMS (IN 1000 HA)--MODEL SOLUTION													
1960	15.00	0.0	10.00	0.0	5.00	0.0	44.00	0.0	971.80	10.10	0.0	3.40	0.0
1961	18.00	0.0	11.70	0.0	5.70	0.0	47.50	0.0	952.20	11.60	0.0	3.80	0.0
1962	21.00	0.0	13.70	0.0	6.60	0.0	51.30	0.0	934.30	13.40	0.0	4.50	0.0
1963	25.90	0.0	16.00	0.0	7.40	0.0	55.40	0.0	917.70	15.40	0.0	5.10	0.0
1964	31.10	0.0	18.70	0.0	8.70	0.0	59.30	0.0	902.30	17.70	0.0	5.90	0.0
1965	37.30	0.0	21.90	0.0	10.10	0.0	59.10	0.0	887.30	20.40	0.0	6.80	0.0
1966	44.80	0.0	25.70	0.0	11.60	0.0	62.70	0.0	873.80	23.40	0.0	7.80	0.0
1967	53.70	0.0	30.00	0.0	13.30	0.0	67.70	0.0	861.00	26.90	0.0	9.00	0.0
1968	64.50	0.0	35.10	0.0	15.30	0.0	73.10	0.0	849.00	31.00	0.0	10.30	0.0
1969	77.40	0.0	41.10	0.0	17.60	0.0	79.00	0.0	837.50	35.60	0.0	11.90	0.0
1970	92.90	0.0	48.10	0.0	20.20	0.0	84.40	0.0	796.90	41.00	0.0	13.70	0.0
LAND USE ON MEDIUM FARMS (IN 1000 HA)--MODEL SOLUTION													
1960	16.90	8.60	11.40	8.60	0.0	7.00	0.0	65.60	1352.80	0.0	15.50	0.0	.70
1961	14.40	19.30	4.30	19.30	3.60	4.80	0.0	59.70	1327.90	0.0	18.60	0.0	6.90
1962	19.10	25.40	0.0	25.40	5.70	2.30	0.0	67.00	1303.50	0.0	22.40	0.0	7.80
1963	18.20	40.50	0.40	29.50	6.90	2.60	0.0	64.50	1281.10	0.0	26.80	0.0	9.00
1964	17.30	60.20	1.40	33.90	7.80	1.30	0.0	61.30	1259.50	0.0	32.20	0.0	10.70
1965	16.30	86.00	2.20	39.40	8.60	0.0	0.0	58.20	1238.70	0.0	38.60	0.0	12.00
1966	17.30	102.70	1.00	48.10	8.40	0.0	0.0	63.10	1218.60	0.0	46.40	0.0	15.50
1967	18.60	102.40	0.0	58.00	8.10	2.00	0.0	67.60	1199.10	0.0	55.60	0.0	19.80
1968	17.80	108.50	1.10	67.40	8.70	3.50	0.0	64.20	1180.20	0.0	66.80	0.0	22.70
1969	16.60	150.20	1.80	79.00	9.50	5.00	0.0	61.00	1122.40	0.0	80.10	0.0	26.70
1970	16.00	147.00	2.80	92.50	9.80	7.70	0.0	58.00	1105.30	0.0	96.10	0.0	32.00
LAND USE ON LARGE FARMS (IN 1000 HA)--MODEL SOLUTION													
1960	[illegible]	35.00	0.0	30.00	0.0	10.50	0.0	90.00	1785.50	0.0	22.50	0.0	7.40
1961	[illegible]	48.30	0.0	35.70	0.0	12.50	0.0	83.70	1754.80	0.0	27.80	0.0	9.30
1962	0.0	66.70	0.0	42.50	0.0	11.60	0.0	80.90	1725.50	0.0	34.80	0.0	11.60
1963	0.0	92.00	0.0	50.60	0.0	10.80	0.0	84.50	1697.30	0.0	43.50	0.0	14.50
1964	0.0	126.90	0.0	60.20	0.0	10.10	0.0	78.60	1641.90	0.0	54.40	0.0	18.10
1965	0.0	141.50	0.0	71.60	0.0	9.40	0.0	73.10	1635.40	0.0	68.00	0.0	22.70
1966	0.0	150.30	0.0	85.20	0.0	8.70	0.0	68.00	1600.70	0.0	85.00	0.0	28.30
1967	0.0	149.70	0.0	101.40	0.0	10.30	0.0	63.20	1584.60	0.0	106.20	0.0	35.40
1968	0.0	206.60	0.0	120.60	0.0	13.60	0.0	58.80	1494.00	0.0	132.80	0.0	44.30
1969	0.0	283.00	0.0	143.60	0.0	17.00	0.0	54.70	1374.10	0.0	166.00	0.0	55.30
1970	0.0	337.50	0.0	170.80	0.0	21.30	0.0	50.90	1263.80	0.0	207.50	0.0	69.20

SOURCE: MODEL RESULTS

TABLE A2: LAND USE BY FARM SIZE AND BY TECHNOLOGY AS A PERCENTAGE OF REGIONAL LAND USE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	WHEAT1	WHEAT2	SOYBW1	SOYBW2	SOYBI1	SOYBI2	CORN1	CORN2	NATPAS	SUPAS1	SUPAS2	WIPAS1	WIPAS2
LAND USE ON SMALL FARMS AS A PERCENTAGE OF REGIONAL LAND USE													
1960	47.0	0.0	46.7	0.0	100.0	0.0	100.0	0.0	23.5	100.0	0.0	100.0	0.0
1961	55.6	0.0	73.1	0.0	61.3	0.0	100.0	0.0	23.6	100.0	0.0	100.0	0.0
1962	52.4	0.0	100.0	0.0	53.7	0.0	100.0	0.0	23.6	100.0	0.0	100.0	0.0
1963	58.7	0.0	97.6	0.0	52.4	0.0	100.0	0.0	23.6	100.0	0.0	100.0	0.0
1964	64.3	0.0	93.0	0.0	52.7	0.0	100.0	0.0	23.6	100.0	0.0	100.0	0.0
1965	69.6	0.0	90.9	0.0	54.0	0.0	100.0	0.0	23.6	100.0	0.0	100.0	0.0
1966	72.1	0.0	96.3	0.0	58.0	0.0	100.0	0.0	23.6	100.0	0.0	100.0	0.0
1967	74.2	0.0	100.0	0.0	62.1	0.0	100.0	0.0	23.6	100.0	0.0	100.0	0.0
1968	78.4	0.0	97.0	0.0	63.7	0.0	100.0	0.0	24.1	100.0	0.0	100.0	0.0
1969	82.3	0.0	95.8	0.0	64.9	0.0	100.0	0.0	24.9	100.0	0.0	100.0	0.0
1970	85.3	0.0	94.5	0.0	67.3	0.0	100.0	0.0	25.2	100.0	0.0	100.0	0.0
LAND USE ON MEDIUM FARMS AS A PERCENTAGE OF REGIONAL LAND USE													
1960	53.0	19.7	53.3	22.3	0.0	41.2	0.0	42.5	32.9	0.0	41.0	0.0	[illegible]
1961	44.4	28.6	26.9	35.1	38.7	27.7	0.0	41.6	32.9	0.0	40.1	0.0	40.0
1962	47.6	27.6	0.0	37.4	46.3	16.5	0.0	42.8	32.9	0.0	39.2	0.0	39.3
1963	41.3	30.6	2.4	36.8	47.6	19.4	0.0	43.3	32.9	0.0	38.1	0.0	38.0
1964	35.7	32.2	7.0	36.0	47.3	11.4	0.0	43.8	32.9	0.0	37.2	0.0	37.2
1965	30.4	37.8	9.1	35.5	46.0	0.0	0.0	44.3	32.9	0.0	36.2	0.0	36.2
1966	27.9	40.6	3.7	36.1	42.0	0.0	0.0	48.1	32.9	0.0	35.3	0.0	35.4
1967	25.7	40.6	0.0	36.4	37.9	15.5	0.0	51.7	32.9	0.0	34.4	0.0	[illegible]
1968	21.6	34.4	3.0	35.9	36.2	20.5	0.0	52.2	33.5	0.0	33.5	0.0	33.4
1969	17.7	34.7	4.2	35.5	35.1	22.7	0.0	52.7	33.8	0.0	32.5	0.0	32.6
1970	14.7	30.3	5.5	35.1	32.7	26.5	0.0	53.3	34.9	0.0	31.7	0.0	31.6
LAND USE ON LARGE FARMS AS A PERCENTAGE OF REGIONAL LAND USE													
1960	0.0	80.3	0.0	77.7	0.0	54.5	0.0	57.5	43.4	0.0	59.0	0.0	58.9
1961	0.0	71.4	0.0	64.9	0.0	72.3	0.0	58.4	43.5	0.0	59.9	0.0	60.0
1962	0.0	72.4	0.0	62.6	0.0	83.5	0.0	57.2	43.5	0.0	60.8	0.0	60.7
1963	0.0	69.4	0.0	63.2	0.0	80.6	0.0	56.7	43.6	0.0	61.9	0.0	62.0
1964	0.0	67.8	0.0	64.0	0.0	88.6	0.0	56.2	43.5	0.0	62.8	0.0	62.8
1965	0.0	62.2	0.0	64.5	0.0	100.0	0.0	55.7	43.8	0.0	63.8	0.0	63.8
1966	0.0	59.4	0.0	63.9	0.0	100.0	0.0	51.9	43.5	0.0	64.7	0.0	64.6
1967	0.0	59.4	0.0	63.6	0.0	84.5	0.0	48.3	43.5	0.0	65.6	0.0	65.7
1968	0.0	65.6	0.0	64.1	0.0	79.4	0.0	47.8	42.4	0.0	66.5	0.0	66.8
1969	0.0	65.3	0.0	64.5	0.0	77.3	0.0	47.3	41.3	0.0	67.5	0.0	67.6
1970	0.0	69.7	0.0	64.9	0.0	73.4	0.0	44.7	39.9	0.0	68.3	0.0	68.4

SOURCE: MODEL RESULTS

TABLE A3: CROPPING PATTERN BY FARM SIZE AND BY TECHNOLOGY: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	WHEAT1	WHEAT2	SOYBW1	SOYBW2	SOYBT1	SOYBT2	CORN1	CORN2	NATPAS	SUPAS1	SUPAS2	WIPAS1	WIPAS2
CROPPING PATTERN ON SMALL FARMS AS A PERCENTAGE OF TOTAL LAND USE ON SMALL FARMS													
1960	1.42	0.0	0.94	0.0	0.47	0.0	4.15	0.0	91.74	0.95	0.0	0.32	0.0
1961	1.71	0.0	1.11	0.0	0.54	0.0	4.32	0.0	90.64	1.10	0.0	0.36	0.0
1962	2.01	0.0	1.31	0.0	0.63	0.0	4.91	0.0	89.42	1.28	0.0	0.43	0.0
1963	2.48	0.0	1.53	0.0	0.73	0.0	5.31	0.0	87.89	1.48	0.0	0.49	0.0
1964	2.98	0.0	1.79	0.0	0.83	0.0	5.74	0.0	86.40	1.69	0.0	0.56	0.0
1965	3.58	0.0	2.10	0.0	0.97	0.0	5.59	0.0	85.16	1.96	0.0	0.65	0.0
1966	4.27	0.0	2.45	0.0	1.10	0.0	5.97	0.0	83.23	2.23	0.0	0.74	0.0
1967	5.06	0.0	2.83	0.0	1.25	0.0	6.38	0.0	81.10	2.53	0.0	0.85	0.0
1968	5.98	0.0	3.26	0.0	1.42	0.0	6.78	0.0	78.74	2.87	0.0	0.96	0.0
1969	7.10	0.0	3.77	0.0	1.61	0.0	7.25	0.0	75.91	3.27	0.0	1.09	0.0
1970	8.47	0.0	4.38	0.0	1.84	0.0	7.49	0.0	72.63	3.74	0.0	1.25	0.0
CROPPING PATTERN ON MEDIUM FARMS AS A PERCENTAGE OF TOTAL LAND USE ON MEDIUM FARMS													
1960	1.13	0.58	0.76	0.58	0.0	0.47	0.0	4.46	90.63	0.0	1.04	0.0	0.35
1961	0.97	1.31	0.29	1.31	0.24	0.32	0.0	4.04	89.89	0.0	1.26	0.0	0.47
1962	1.29	1.72	0.0	1.72	0.39	0.15	0.0	4.59	88.12	0.0	1.51	0.0	0.41
1963	1.23	2.74	0.03	1.99	0.47	0.18	0.0	4.36	86.60	0.0	1.81	0.0	0.60
1964	1.16	4.05	0.09	2.28	0.53	0.09	0.0	4.13	84.78	0.0	2.17	0.0	0.72
1965	1.09	5.72	0.15	2.63	0.57	0.0	0.0	3.88	82.53	0.0	2.57	0.0	0.86
1966	1.14	6.75	0.07	3.16	0.55	0.0	0.0	4.15	80.11	0.0	3.09	0.0	1.07
1967	1.22	6.69	0.0	3.79	0.53	0.13	0.0	4.42	78.38	0.0	3.69	0.0	1.31
1968	1.16	7.04	0.07	4.38	0.56	0.23	0.0	4.17	76.62	0.0	4.34	0.0	1.44
1969	1.07	9.67	0.12	5.09	0.61	0.32	0.0	3.93	72.31	0.0	5.16	0.0	1.72
1970	1.02	9.38	0.18	5.90	0.63	0.49	0.0	3.70	70.53	0.0	6.13	0.0	2.04
CROPPING PATTERN ON LARGE FARMS AS A PERCENTAGE OF TOTAL LAND USE OF LARGE FARMS													
1960	0.0	1.77	0.0	1.52	0.0	0.51	0.0	4.55	90.17	0.0	1.13	0.0	0.37
1961	0.0	2.45	0.0	1.81	0.0	0.63	0.0	4.24	88.98	0.0	1.41	0.0	0.47
1962	0.0	3.36	0.0	2.14	0.0	0.59	0.0	4.58	86.99	0.0	1.79	0.0	0.66
1963	0.0	4.62	0.0	2.54	0.0	0.54	0.0	4.24	85.15	0.0	2.18	0.0	0.79
1964	0.0	6.31	0.0	2.98	0.0	0.50	0.0	3.91	82.67	0.0	2.71	0.0	0.90
1965	0.0	7.00	0.0	3.94	0.0	0.46	0.0	3.62	80.89	0.0	3.36	0.0	1.12
1966	0.0	7.39	0.0	4.19	0.0	0.43	0.0	3.34	79.09	0.0	4.18	0.0	1.39
1967	0.0	7.30	0.0	4.94	0.0	0.53	0.0	3.09	77.24	0.0	5.19	0.0	1.73
1968	0.0	9.98	0.0	5.82	0.0	0.66	0.0	2.84	72.15	0.0	6.41	0.0	2.14
1969	0.0	13.52	0.0	6.86	0.0	0.81	0.0	2.61	65.49	0.0	7.93	0.0	2.64
1970	0.0	15.91	0.0	8.05	0.0	1.00	0.0	2.40	59.59	0.0	9.78	0.0	3.26

SOURCE: MODEL RESULTS

TABLE A41 REGIONAL LAND USE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	WHEAT	SOYBN	CORN	HAPAS	SUPAS	WIPAS
LAND USE BY CROP ON SMALL FARMS (IN 1000 HA)						
1960	15.00	15.00	44.00	971.50	10.10	5.40
1961	18.00	17.40	47.50	952.20	11.60	5.80
1962	21.00	20.30	51.30	934.30	13.40	4.50
1963	25.90	23.60	55.40	917.70	15.40	5.10
1964	31.10	27.40	59.90	902.30	17.70	5.90
1965	37.30	32.00	58.10	887.30	20.40	6.80
1966	44.80	37.30	62.70	873.80	23.40	7.80
1967	53.70	43.30	67.70	861.00	26.90	9.00
1968	64.50	50.40	73.10	849.00	31.00	10.30
1969	77.40	58.70	79.00	827.50	35.60	11.90
1970	92.90	68.30	84.40	796.90	41.00	13.70
LAND USE BY CROP ON MEDIUM FARMS (IN 1000 HA)						
1960	25.50	27.00	66.60	1352.80	15.50	5.20
1961	33.70	32.00	59.70	1327.30	19.60	6.20
1962	44.50	33.40	67.90	1303.50	22.40	7.50
1963	58.70	39.40	64.50	1281.10	26.80	8.90
1964	77.50	44.40	61.30	1259.50	32.20	10.70
1965	102.30	50.20	58.20	1238.70	38.60	12.90
1966	120.00	57.50	63.10	1218.60	46.40	15.50
1967	121.00	68.10	67.60	1199.10	55.60	18.50
1968	126.30	80.70	64.20	1180.20	66.50	22.20
1969	166.80	95.30	61.00	1122.80	80.10	26.70
1970	163.00	112.80	58.00	1105.30	96.10	32.00
LAND USE BY CROP ON LARGE FARMS (IN 1000 HA)						
1960	35.00	40.00	90.00	1785.30	22.30	7.40
1961	48.30	48.20	83.70	1754.80	27.80	9.30
1962	66.70	54.10	90.90	1725.50	34.80	11.60
1963	92.00	61.40	84.50	1697.30	43.50	14.50
1964	126.90	70.30	78.60	1661.90	54.40	18.10
1965	141.50	81.00	73.10	1635.40	68.00	22.70
1966	150.30	93.00	68.00	1609.70	85.00	28.30
1967	149.70	112.30	63.20	1584.60	106.20	35.40
1968	204.60	134.20	58.80	1494.00	132.80	44.30
1969	212.00	160.60	54.70	1374.10	166.00	55.30
1970	337.50	192.00	50.90	1263.80	207.50	69.20

SOURCE: MODEL RESULTS

TABLE A42: LAND USE BY FARM SIZE AS A PERCENTAGE OF REGIONAL LAND USE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	WHEAT	SOYBN	CORN	HAPAS	SUPAS	WIPAS
CROPPING PATTERN ON SMALL FARMS						
1960	19.87	19.29	21.93	23.64	21.09	21.25
1961	18.00	17.83	24.88	23.60	20.00	19.69
1962	15.99	18.83	24.42	23.57	18.98	19.07
1963	14.67	18.97	27.10	23.55	17.97	17.89
1964	13.21	19.28	29.98	23.60	16.97	17.00
1965	13.27	19.61	30.68	23.59	16.06	16.04
1966	14.22	19.77	32.35	23.60	15.12	15.12
1967	16.55	19.36	34.11	23.62	14.26	14.31
1968	16.73	19.00	37.28	24.10	13.44	13.41
1969	14.68	18.66	40.58	24.89	12.64	12.67
1970	15.66	18.31	43.66	25.17	11.90	11.92
CROPPING PATTERN ON MEDIUM FARMS						
1960	33.77	32.93	29.20	32.92	32.36	32.50
1961	32.70	32.79	31.27	32.90	32.07	32.12
1962	32.66	30.98	32.32	32.89	31.73	31.78
1963	33.24	31.67	31.56	32.88	31.27	31.23
1964	32.91	31.25	30.68	32.94	30.87	30.84
1965	36.39	30.76	30.73	32.93	30.39	30.42
1966	38.08	30.47	32.56	32.92	29.97	30.04
1967	7.30	30.44	34.06	32.90	29.46	29.41
1968	31.78	30.42	32.74	33.50	28.97	28.91
1969	31.64	30.29	31.33	33.77	28.43	28.43
1970	27.47	30.23	30.01	34.91	27.89	27.85
CROPPING PATTERN ON LARGE FARMS						
1960	46.36	48.78	44.87	43.44	46.56	46.25
1961	48.30	49.39	43.84	43.50	47.93	48.19
1962	50.45	50.19	43.27	43.54	49.29	49.15
1963	52.10	49.36	41.34	43.56	50.76	50.88
1964	53.89	49.47	39.34	43.46	52.16	52.16
1965	50.34	49.63	38.60	43.48	53.54	53.54
1966	47.70	49.76	32.09	43.48	54.91	54.84
1967	46.15	50.20	31.84	43.48	56.28	56.28
1968	51.99	50.58	29.98	42.40	57.59	57.68
1969	53.68	51.05	28.09	41.33	59.93	58.99
1970	56.88	51.46	26.33	39.92	60.21	60.23

SOURCE: MODEL RESULTS

TABLE A6: CROPPING PATTERN BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	WHEAT	SOYBN	CORN	NAPAS	SUPAS	MIPAS
CROPPING PATTERN ON SMALL FARMS						
1960	1.42	1.42	4.15	91.74	0.95	0.32
1961	1.71	1.66	4.52	90.64	1.10	0.36
1962	2.01	1.94	4.91	89.42	1.29	0.43
1963	2.48	2.26	5.31	87.99	1.48	0.49
1964	2.99	2.62	5.74	86.40	1.69	0.56
1965	3.58	3.07	5.58	85.16	1.96	0.65
1966	4.27	3.55	5.97	83.23	2.23	0.74
1967	5.06	4.08	6.38	81.10	2.53	0.85
1968	5.98	4.67	6.78	78.74	2.87	0.96
1969	7.18	5.38	7.25	75.91	3.27	1.09
1970	8.47	6.22	7.69	72.63	3.74	1.25
CROPPING PATTERN ON MEDIUM FARMS						
1960	1.71	1.81	4.46	90.63	1.04	0.35
1961	2.28	2.17	4.04	89.83	1.26	0.42
1962	3.02	2.26	4.59	88.12	1.51	0.51
1963	3.97	2.66	4.36	86.60	1.81	0.60
1964	5.22	2.99	4.13	84.78	2.17	0.72
1965	6.82	3.34	3.88	82.53	2.57	0.86
1966	7.89	3.78	4.15	80.11	3.05	1.02
1967	7.91	4.45	4.42	79.38	3.63	1.21
1968	8.28	5.24	4.17	76.62	4.34	1.44
1969	10.74	6.14	3.93	72.31	5.16	1.72
1970	10.48	7.20	3.70	70.53	6.13	2.04
CROPPING PATTERN ON LARGE FARMS						
1960	1.77	2.02	4.55	90.17	1.13	0.37
1961	2.45	2.44	4.24	88.98	1.41	0.47
1962	3.36	2.73	4.50	86.99	1.75	0.58
1963	4.62	3.08	4.24	85.15	2.10	0.73
1964	6.31	3.50	3.91	82.67	2.71	0.90
1965	7.00	4.01	3.62	80.89	3.36	1.12
1966	7.39	4.61	3.34	79.09	4.19	1.39
1967	7.30	5.47	3.08	77.24	5.19	1.73
1968	9.98	6.48	2.84	72.15	6.41	2.14
1969	12.52	7.67	2.61	69.63	7.93	2.64
1970	14.91	9.05	2.40	66.59	9.78	3.26

SOURCE: MODEL RESULTS

TABLE A7: TOTAL LAND USE BY FARM SIZE (IN 1000 HECTARES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1050.99976	1492.59985	1979.99976
1961	1050.49951	1477.49976	1972.09961
1962	1044.79980	1479.19971	1983.59961
1963	1045.09961	1479.29966	1993.19995
1964	1044.29980	1485.59985	2010.19946
1965	1041.89966	1500.89966	2021.69971
1966	1049.79956	1521.09985	2035.19971
1967	1061.59985	1529.89990	2051.39966
1968	1078.29980	1540.39966	2070.69927
1969	1090.09961	1552.69971	2093.69971
1970	1097.19971	1567.19946	2120.89966

SOURCE: MODEL RESULTS

TABLE A8: TOTAL LABOR USE BY FARM SIZE (IN 1000 HOURS): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	47752.3984	24342.3008	15259.8984
1961	52880.5000	23245.8008	15079.6992
1962	59099.6016	23718.1992	15739.3008
1963	66052.8125	24184.8984	15724.1016
1964	74044.6250	24668.6016	15844.8984
1965	79873.3750	25180.8984	15940.1992
1966	90211.1875	25665.3008	16112.8008
1967	102168.812	26178.6016	16378.0000
1968	116019.875	26702.0000	16986.5000
1969	132035.500	27236.1992	17831.6016
1970	150107.125	27780.8984	19801.8008

SOURCE: MODEL RESULTS

TABLE A9: TOTAL HIRED LABOR BY FARM SIZE (IN 1000 HOURS): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	1552.30605	7219.89844
1961	0.0	0.0	6874.89844
1962	0.0	7.50000	7374.50000
1963	0.0	0.0	7192.00000
1964	0.0	0.0	7142.19922
1965	0.0	0.0	7063.39844
1966	0.0	0.0	7058.39844
1967	0.0	0.0	7142.60156
1968	0.0	0.0	7566.39844
1969	0.0	0.0	8223.10156
1970	0.0	0.0	9001.10156

SOURCE: MODEL RESULTS

TABLE A11: HIRED LABOR HOURS AS A PERCENTAGE OF TOTAL LABOR HOURS USED BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	6.37696	47.31288
1961	0.0	0.0	45.00251
1962	0.0	0.03162	46.85403
1963	0.0	0.0	45.73869
1964	0.0	0.0	45.07568
1965	0.0	0.07545	44.31184
1966	0.0	0.0	43.80617
1967	0.0	0.0	43.61095
1968	0.0	0.0	44.54358
1969	0.0	0.0	46.11533
1970	0.0	0.0	47.87360

SOURCE: MODEL RESULTS

TABLE A10: TOTAL LABOR HOURS USED AS A PERCENTAGE OF TOTAL FAMILY LABOR HOURS AVAILABLE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	26.52910	106.81123	189.79968
1961	28.82713	100.00000	183.83197
1962	31.55804	100.03156	188.16119
1963	34.57945	100.00000	184.29337
1964	38.00320	100.00000	182.06873
1965	40.19099	100.07542	179.57143
1966	44.50275	100.00000	177.95543
1967	49.41339	100.00000	177.33936
1968	55.01213	100.00000	180.32178
1969	61.37856	100.00000	185.58148
1970	68.41116	100.00000	191.84140

SOURCE: MODEL RESULTS

TABLE A12: QUASI-FIXED CAPITAL STOCK (CAPITAL FORMATION IN FARM POWER) BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)*

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	849.1	6830.3	18166.8
1961	964.8	10916.3	21769.9
1962	1086.6	12768.9	44036.8
1963	1224.3	17242.6	34388.5
1964	1383.8	22128.9	44036.8
1965	1511.5	28730.0	49079.5
1966	1716.5	33975.6	53771.6
1967	1951.5	35807.9	57598.4
1968	2224.8	39368.5	75994.6
1969	2542.2	52142.1	98577.5
1970	2900.8	53406.6	116869.3

SOURCE: MODEL RESULTS

TABLE A13: TOTAL VALUE OF LAND IN USE BY FARM SIZE (IN MILLION CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)**

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	277.88	394.12	524.18
1961	278.12	391.91	525.62
1962	278.78	396.16	534.62
1963	279.59	399.60	542.69
1964	282.38	405.32	554.80
1965	283.67	414.55	563.37
1966	288.85	425.65	572.63
1967	295.49	432.10	582.87
1968	303.97	439.13	604.18
1969	311.92	452.66	631.37
1970	319.35	461.09	658.79

SOURCE: MODEL RESULTS

TABLE A14: ESTIMATED TOTAL CAPITAL STOCK (QUASI-FIXED CAPITAL STOCK + VALUE OF LAND IN USE) BY FARM SIZE (IN MILLION CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	278.73	400.95	542.35
1961	279.08	402.83	547.39
1962	279.86	408.93	561.84
1963	280.81	416.84	577.08
1964	283.76	427.45	598.84
1965	285.18	443.28	612.45
1966	290.57	459.63	626.40
1967	297.44	467.91	641.46
1968	306.19	478.50	680.17
1969	314.46	504.80	729.95
1970	322.25	514.50	775.66

SOURCE: MODEL RESULTS

*Computation of quasi-fixed capital stock that includes draft animals, combines and tractors is carried out as follows:

Capital Stock(t)=(1-d) X Capital Stock (t-1) + Investment Capital (t)

Where d is a depreciation coefficient.

Small farms' d=20% where capital components are work animals only.

Medium farms' d=12% where capital components are both work animals and tractors and combines, and hence d for medium farms are weighted average of d's for traditional and modern farm powers.

Large farms' d=10% where capital components are only tractors and combines.

**Land in use includes crop lands and improved pasture lands that are evaluated at 400 CR$ per hectare and land left to natural pasture which is evaluated at 250 CR$ per hectare. The per hectare prices of land are weighted averages obtained from the sample farm record data of the three municipios in the wheat region, namely Carazinho, Nao Me Toque and Sao Borja. For the data description, see Norman Rask, "Analysis of Capital Formation and Utilization in Less Developed Countries," Occasional Paper No. 6, Department of Agricultural Economics and Rural Sociology, the Ohio State University December 1969.

TABLE A15: VALUE OF QUASI-FIXED CAPITAL STOCK AS A PERCENTAGE OF THE ESTIMATED VALUE OF TOTAL CAPITAL STOCK: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.30	1.70	3.34
1961	0.34	2.71	3.97
1962	0.38	3.12	4.84
1963	0.43	4.14	5.9[illegible]
1964	0.48	5.18	7.35
1965	0.53	6.48	8.01
1966	0.59	7.39	8.58
1967	0.65	7.63[illegible]	8.98
1968	0.73	8.23[illegible]	11.17
1969	0.81	10.33	13.50
1970	0.90	10.38	15.07

SOURCE: MODEL RESULTS

TABLE A16: TOTAL DRAFT ANIMAL USE BY FARM SIZE (IN 1000 HOURS): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	5798.89044	1877.50000	0.0
1961	6515.10156	1763.69995	0.0
1962	7333.89844	1787.50000	0.0
1963	8271.69922	1841.50000	0.0
1964	9347.89844	1897.60010	0.0
1965	10117.6016	1940.69995	0.0
1966	11505.1016	1932.10010	0.0
1967	13108.3984	1939.19995	0.0
1968	14964.3078	1988.80005	0.0
1969	17115.8008	2010.19995	0.0
1970	19545.8984	2048.19995	0.0

SOURCE: MODEL RESULTS

TABLE A17: TOTAL TRACTOR USE BY FARM SIZE (IN 1000 HOURS): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	705.80005	1194.19995
1961	0.0	788.69995	1323.80005
1962	0.0	921.69995	1569.39990
1963	0.0	1052.80005	1790.39995
1964	0.0	1212.00000	2161.60010
1965	0.0	1426.60010	2308.39990
1966	0.0	1664.60010	2515.39990
1967	0.0	1809.60010	2723.60010
1968	0.0	1950.89990	3373.30005
1969	0.0	2365.89990	4225.10156
1970	0.0	2500.80005	5020.19922

SOURCE: MODEL RESULTS

TABLE A18: TOTAL COMBINE USE BY FARM SIZE (IN 1000 HOURS): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	241.42000	712.50000
1961	0.0	434.03003	916.75000
1962	0.0	530.16992	1147.23997
1963	0.0	726.62988	1456.81006
1964	0.0	954.57007	1872.92993
1965	0.0	1254.53003	2112.80005
1966	0.0	1508.90991	2319.94995
1967	0.0	1623.52002	2488.45996
1968	0.0	1793.95996	3237.65991
1969	0.0	2342.37988	4213.35937
1970	0.0	2471.79004	5030.67969

SOURCE: MODEL RESULTS

TABLE A19: TOTAL MECHANICAL POWER USE BY FARM SIZE (IN MILLION BRAKE HORSE POWER HOURS): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	47.36099	95.33493
1961	0.0	61.13649	112.02759
1962	0.0	72.59343	135.83186
1963	0.0	88.97144	162.35550
1964	0.0	108.32849	198.72643
1965	0.0	134.05649	221.05994
1966	0.0	158.67543	241.76736
1967	0.0	171.65599	260.66278
1968	0.0	187.24287	330.54785
1969	0.0	235.41386	421.92285
1970	0.0	248.62949	502.54370

SOURCE: MODEL RESULTS

TABLE A20: GROSS NEW INVESTMENTS IN DRAFT ANIMALS BY FARM SIZE (IN 1000): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.12000	0.0	0.0
1961	0.78000	0.0	0.0
1962	0.86000	0.12300	0.0
1963	0.97000	0.16700	0.0
1964	1.16500	0.17100	0.0
1965	1.06300	0.17000	0.0
1966	1.38600	0.15200	0.0
1967	1.58000	0.15900	0.0
1968	1.81300	0.17700	0.0
1969	2.08300	0.16900	0.0
1970	2.36900	0.17700	0.0

SOURCE: MODEL RESULTS

TABLE A21: GROSS NEW INVESTMENTS IN TRACTORS BY FARM SIZE (IN 1000): WHEAT REGION IN THE STATE OF RIO GRAND DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	0.07800	0.17200
1961	0.0	0.06900	0.16700
1962	0.0	0.09900	0.17800
1963	0.0	0.10200	0.17100
1964	0.0	0.12200	0.22800
1965	0.0	0.15600	0.18600
1966	0.0	0.17400	0.20000
1967	0.0	0.13800	0.21000
1968	0.0	0.14700	0.44000
1969	0.0	0.29000	0.55100
1970	0.0	0.15700	0.55400

SOURCE: MODEL RESULTS

TABLE A22: TOTAL OUTLAYS ON INVESTMENT GOODS BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	43.92000	4987.19531	14472.7930
1961	285.47998	4905.59375	5416.79687
1962	314.75977	3162.61768	7627.17922
1963	355.61978	6005.91797	9990.39453
1964	404.42969	6955.38281	13187.1953
1965	389.05786	9256.61719	9446.29453
1966	507.27588	8693.22656	9599.99609
1967	578.27979	5909.39062	9203.99219
1968	663.55786	7857.57812	24155.9922
1969	762.37793	17497.8477	30182.3984
1970	867.05396	7521.57422	28149.5977

SOURCE: MODEL RESULTS

TABLE A23: TOTAL OUTLAYS ON ALL INPUTS BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	34405.4258	74541.5625	157785.250
1961	35723.2969	64940.8281	151059.187
1962	36997.0273	68214.0000	166464.062
1963	36761.9336	76886.7500	176938.125
1964	40754.7031	85070.9375	193310.812
1965	42240.1328	97086.7500	196890.437
1966	45031.7031	105750.000	204069.375
1967	48253.3359	107434.937	210475.500
1968	52099.1484	114809.187	254624.312
1969	56405.0977	141936.437	299829.875
1970	61155.5508	136284.625	333516.625

SOURCE: MODEL RESULTS

TABLE A24: TOTAL OUTLAYS ON VARIABLE INPUTS BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	34361.5039	69554.3125	142912.437
1961	35437.8164	60035.2344	145642.375
1962	36682.2656	65051.3828	158836.812
1963	38400.9142	70880.8125	167047.687
1964	40350.2734	78115.5000	180223.562
1965	41851.0742	87830.1250	187444.000
1966	44524.4258	97056.7500	194469.375
1967	47675.0547	101525.500	201271.500
1968	51435.5898	106951.562	230468.312
1969	55642.7187	124438.562	269647.437
1970	60288.4961	128763.000	305367.000

SOURCE: MODEL RESULTS

TABLE A25: TOTAL OUTLAYS ON NUTRIENTS BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	6257.99609	9729.29297	13322.3945
1961	7005.59375	10300.4922	14710.4922
1962	7820.39453	12303.8867	17562.2891
1963	8872.49219	13878.8867	20101.1992
1964	10019.0898	15852.8906	23820.2891
1965	10787.6914	18515.6914	25596.8945
1966	12255.5898	21205.7891	26982.8945
1967	13950.2891	22343.9922	27890.0859
1968	15932.6953	23417.0898	35212.7930
1969	18236.3906	28341.5937	45032.3945
1970	20838.2891	28837.1953	53115.2930

SOURCE: MODEL RESULTS

TABLE A26: TOTAL DEMAND FOR DEBT BY FARM SIZE (IN MILLION CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

1960	0.0	0.0	0.0
1961	0.0	0.0	0.0
1962	0.0	0.0	0.0
1963	2.61728	0.0	10.04012
1964	12.68031	18.91904	46.10347
1965	13.14167	34.31859	54.18555
1966	17.86287	51.94103	61.97263
1967	6.29317	34.69774	33.55768
1968	0.0	26.25003	60.85378
1969	3.33251	69.49225	139.72505
1970	7.87930	77.77730	192.53612

SOURCE: MODEL RESULTS

B. FACTOR PRODUCTIVITIES

1) Total Output

2) Land Productivity

3) Labor Productivity

4) Capital Productivity

DEFINITIONS USED:

Average Net Land Productivity per Hectare (t) =
{Gross Revenue (t)-Total Cost (t)} / Total Labor in Use (t) : [Table B2]

Average Net Labor Productivity per Hour (t) =
{Gross Revenue (t)-Total Cost (t)} / Total Labor Hours Employed (t)
: [Table B3]

Average Net Productivity of Annual Total Cash Outlays (t) =
{Gross Revenue (t)-Total Cost (t)} / Total Cost (t) : [Table B4]

Average Net Productivity of Total Capital Stock (t) =
{Gross Revenue (t)-Total Cost (t)} / Estimated Value of Total Capital Stock (t), : [Table B5]
where Total Capital Stock includes quasi-fixed capital plus value of land in use as defined in Tables A12 and A13.

Definition of ICOR is given in Table B7

Average Net Productivity of Working Capital (t) =
{Gross Revenue (t)-Total Cost (t)} / Total Working Capital (t), : [Table B8]

where total cost consists of working capital plus investment capital.

SMALL FARM = Small farms with 0~50 hectares
MEDIUM FARM = Medium farms with 51~300 hectares
LARGE FARM = Large farms with above 300 hectares

TABLE B1: TOTAL OUTPUT BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	96344.5000	141893.625	191914.250
1961	98943.8125	146176.000	200503.125
1962	101917.250	153419.250	213496.812
1963	106164.000	162253.687	228371.875
1964	111939.812	173141.687	248889.375
1965	115450.437	187693.000	261549.000
1966	122272.187	201333.000	273373.500
1967	130327.750	208523.812	284423.187
1968	140032.250	217744.375	322433.500
1969	150839.375	243152.687	372008.062
1970	162829.375	251526.625	416104.875

SOURCE: MODEL RESULTS

TABLE B2: AVERAGE NET LAND PRODUCTIVITY PER HECTARE BY FARM SIZE (IN CONSTANT 1970 CR$/HA): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	58.48827	45.12398	17.23686
1961	60.18138	54.98148	25.07172
1962	62.13651	57.60225	23.71080
1963	64.61708	57.70377	25.80461
1964	67.20776	59.28294	27.64827
1965	70.26611	60.36795	31.98227
1966	73.57635	62.83807	34.05273
1967	77.31197	66.07547	36.04742
1968	81.54787	66.82368	32.74699
1969	86.62900	65.18726	34.47398
1970	92.66664	73.53371	38.94019

SOURCE: MODEL RESULTS

TABLE B3: AVERAGE NET LABOR PRODUCTIVITY PER HOUR BY FARM SIZE (IN CONSTANT 1970 CR$/HR): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1.29709	2.76687	2.23657
1961	1.19553	3.49461	3.27971
1962	1.09849	3.59240	2.98824
1963	1.02043	3.52976	3.27101
1964	0.94788	3.57016	3.50766
1965	0.91658	3.59821	4.05632
1966	0.85622	3.72421	4.30118
1967	0.80332	3.86151	4.51506
1968	0.75791	3.85496	3.99195
1969	0.71527	3.71624	4.04777
1970	0.67734	4.14825	4.39257

SOURCE: MODEL RESULTS

TABLE B4: AVERAGE NET PRODUCTIVITY OF ANNUAL TOTAL CASH OUTLAYS BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1.80027	0.90355	0.21630
1961	1.76973	1.25091	0.32731
1962	1.75474	1.24909	0.28754
1963	1.73887	1.11029	0.29069
1964	1.72213	1.03526	0.28751
1965	1.73319	0.93325	0.32840
1966	1.71525	0.90386	0.33961
1967	1.70190	0.94093	0.35134
1968	1.68780	0.89658	0.26631
1969	1.67421	0.71311	0.24073
1970	1.66254	0.84560	0.24753

SOURCE: MODEL RESULTS

TABLE B5: AVERAGE NET PRODUCTIVITY OF TOTAL CAPITAL STOCK (IN CR$ AT 1970 PRICES) BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.222	0.168	0.063
1961	0.227	0.202	0.090
1962	0.232	0.208	0.084
1963	0.240	0.205	0.089
1964	0.247	0.206	0.093
1965	0.257	0.204	0.106
1966	0.267	0.208	0.111
1967	0.276	0.216	0.115
1968	0.287	0.215	0.099
1969	0.300	0.201	0.098
1970	0.316	0.224	0.106

SOURCE: MODEL RESULTS

TABLE B6: YEARLY CHANGE IN TOTAL CAPITAL STOCK AND GROSS OUTPUT (IN MILLION CR$ AT 1970 PRICES) BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM		MEDIUM FARM		LARGE FARM	
	ΔK	ΔY	ΔK	ΔY	ΔK	ΔY
1961	0.35	2.599	1.88	4.282	5.04	8.589
1962	0.78	2.973	6.10	7.243	14.45	12.994
1963	0.95	4.246	15.24	8.834	15.24	14.875
1964	2.95	4.775	21.76	10.888	21.76	20.518
1965	2.42	4.511	15.83	14.551	13.61	12.660
1966	5.39	6.822	16.35	13.640	13.95	11.825
1967	6.87	8.056	8.28	7.191	15.06	11.050
1968	8.75	9.705	10.59	9.221	53.77	38.010
1969	8.27	10.807	26.30	25.408	49.78	49.575
1970	7.79	11.990	9.70	8.374	45.71	44.097

SOURCE: MODEL RESULTS

Where ΔK is a yearly change in value of total capital stock (value of quasi-fixed capital stock and land in use) and ΔY is a yearly change in value of gross output.

TABLE B7: INCREMENTAL CAPITAL-OUTPUT RATIOS (ICOR AT CONSTANT 1970 PRICES) BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1961	0.135	0.439	0.586
1962	0.262	0.842	1.212
1963	0.224	1.725	1.025
1964	0.618	1.998	1.061
1965	0.315	1.088	1.075
1966	0.790	1.199	1.179
1967	0.853	1.151	1.362
1968	0.902	1.148	1.615
1969	0.765	1.035	1.004
1970	0.649	1.158	1.037

SOURCE: MODEL RESULTS

Where: $$ICOR = \frac{\{\text{Total Capital Stock}(t) - \text{Total Capital Stock}(t-1)\}}{\{\text{Gross Output}(t) - \text{Gross Output}(t-1)\}}$$

TABLE B8: AVERAGE NET PRODUCTIVITY OF WORKING CAPITAL BY FARM SIZE (IN CR$): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1.80257	0.96834	0.23841
1961	1.78398	1.35312	0.33949
1962	1.76980	1.30981	0.29611
1963	1.75495	1.20437	0.30790
1964	1.73939	1.12744	0.30839
1965	1.74930	1.03161	0.34495
1966	1.73479	0.98482	0.35638
1967	1.72154	0.99570	0.36740
1968	1.70958	0.96245	0.29422
1969	1.69715	0.81338	0.26768
1970	1.68645	0.99499	0.27044

SOURCE: MODEL RESULTS

C. FACTOR PROPORTIONS

1) Factor Proportions per Hectare

2) Factor Proportions per Labor Hour

DEFINITIONS USED:

Total Capital Expenditures in Table C4 includes both investment capital and working capital. The investment capital in Table C5 covers the purchase outlays on farm power sources such as draft animals, tractors and combines. The working capital in Table C6 refers to cash outlays on machine operations, labor hiring, nutrients use (see Table C7), seeds used in cropping activities, transportation, and bone meal and salts for beef enterprises.

SMALL FARM = Small farms with 0~50 hectares
MEDIUM FARM = Medium farms with 51~300 hectares
LARGE FARM = Large farms with above 300 hectares

TABLE C1: AVERAGE LABOR HOURS PER HECTARE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	45.69198	16.30865	7.70702
1961	50.33842	15.73320	7.64449
1962	56.55548	16.03447	7.93472
1963	63.32358	16.34778	7.88887
1964	70.91359	16.60513	7.88225
1965	76.66129	16.77719	7.88455
1966	85.93181	16.87285	7.91706
1967	96.24040	17.11131	7.98382
1968	107.59518	17.33446	8.20327
1969	121.12241	17.54118	8.51679
1970	136.86930	17.72646	8.86501

SOURCE: MODEL RESULTS

TABLE C2: AVERAGE DRAFT ANIMAL HOURS EMPLOYED PER HECTARE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	5.47583	1.25787	0.0
1961	6.20191	1.19371	0.0
1962	7.01943	1.20842	0.0
1963	7.92992	1.24476	0.0
1964	8.95135	1.27733	0.0
1965	9.71072	1.29302	0.0
1966	10.95933	1.27020	0.0
1967	12.34778	1.26753	0.0
1968	13.87768	1.29109	0.0
1969	15.70113	1.29465	0.0
1970	17.81435	1.30692	0.0

SOURCE: MODEL RESULTS

TABLE C3: AVERAGE TRACTOR HOURS EMPLOYED PER HECTARE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	0.47287	0.60313
1961	0.0	0.53381	0.67126
1962	0.0	0.62311	0.79119
1963	0.0	0.71164	0.89820
1964	0.0	0.81583	1.04547
1965	0.0	0.95050	1.14181
1966	0.0	1.09434	1.23595
1967	0.0	1.18282	1.32768
1968	0.0	1.26649	1.62936
1969	0.0	1.52373	2.01801
1970	0.0	1.59571	2.36701

SOURCE: MODEL RESULTS

TABLE C4: TOTAL ANNUAL CAPITAL EXPENDITURES (IN CONSTANT 1970 CR$) PER HECTARE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	32.48860	49.94075	79.68953
1961	34.00600	43.95319	76.59814
1962	35.41063	46.11546	83.92019
1963	37.16032	51.97159	88.77687
1964	39.02586	57.26369	96.16498
1965	40.54146	64.68570	97.38857
1966	42.89552	69.52205	100.26994
1967	45.45340	70.22350	102.60092
1968	48.31001	74.53207	122.96518
1969	51.74306	91.41267	143.20576
1970	55.73784	86.96060	157.25243

SOURCE: MODEL RESULTS

TABLE C5: GROSS NEW INVESTMENT CAPITAL (IN CONSTANT 1970 CR$) PER HECTARE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.04147	3.34128	7.51151
1961	0.27176	3.32020	2.74672
1962	0.30126	2.13806	3.84513
1963	0.34035	4.05970	4.96207
1964	0.38727	4.68187	6.51040
1965	0.37341	6.16738	4.67250
1966	0.48321	5.71509	4.71698
1967	0.54472	3.86260	4.48669
1968	0.61537	5.10100	11.66562
1969	0.69937	11.26931	14.41582
1970	0.79024	4.79937	13.27248

SOURCE: MODEL RESULTS

TABLE C6: AVERAGE WORKING CAPITAL USE (IN CONSTANT 1970 CR$) PER HECTARE BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	32.44713	46.59943	72.17799
1961	33.73425	40.63298	73.85143
1962	35.10936	43.97742	80.07503
1963	36.81998	47.91187	83.80879
1964	38.63858	52.58179	89.65456
1965	40.16805	58.51831	92.71603
1966	42.41231	63.80695	95.55296
1967	44.90868	66.36087	98.11423
1968	47.70064	69.43105	111.29974
1969	51.04370	80.14334	128.78992
1970	54.94760	82.16119	143.97993

SOURCE: MODEL RESULTS

TABLE C7: TOTAL OUTLAYS ON NUTRIENTS PER HECTARE BY FARM SIZE (IN CONSTANT 1970 CR$/HA): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	5.90935	6.51835	6.72848
1961	6.66882	6.97157	7.45930
1962	7.48506	8.31793	8.85375
1963	8.50589	9.38143	10.08489
1964	9.59407	10.67104	11.84971
1965	10.35387	12.33639	12.66108
1966	11.67422	13.94109	13.25811
1967	13.14082	14.60487	13.59564
1968	14.77576	15.20196	17.06526
1969	16.72910	18.25310	21.50851
1970	18.99223	18.40045	25.04375

SOURCE: MODEL RESULTS

TABLE C8: TOTAL OUTLAYS ON NUTRIENTS AS A PERCENTAGE OF TOTAL WORKING CAPITAL BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	18.21222	13.98805	9.32206
1961	19.76868	17.15739	10.10042
1962	21.31927	18.91409	11.05681
1963	23.10129	19.58058	12.03321
1964	24.83028	20.29416	13.21707
1965	25.77637	21.08124	13.65575
1966	27.52553	21.84885	13.87513
1967	29.26119	22.00824	13.85695
1968	30.97600	21.89503	15.27880
1969	32.77408	22.77556	16.70047
1970	34.56429	22.39555	17.39391

SOURCE: MODEL RESULTS

D. CREDIT USE

DEFINITIONS USED:

Total cash outlays in Table D2 includes both investment capital and working capital as defined in the Section C. Credit use refers to short term borrowings (one crop year) at a nominal rate of 15 percent per annum.

SMALL FARM = Small farms with 0~50 hectares
MEDIUM FARM = Medium farms with 51~300 hectares
LARGE FARM = Large farms with above 300 hectares

TABLE D1: BORROWING/INTERNAL CAPITAL FINANCING RATIOS BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	0.0	0.0
1961	0.0	0.0	0.0
1962	0.0	0.0	0.0
1963	0.04235	0.0	0.05833
1964	0.30862	0.21851	0.37868
1965	0.25552	0.30965	0.34728
1966	0.32877	0.46814	0.37517
1967	0.11486	0.33083	0.19954
1968	0.0	0.23077	0.32879
1969	0.05329	0.67354	0.92960
1970	0.14793	1.25709	2.29388

SOURCE: MODEL RESULTS

TABLE D2: TOTAL CREDIT USE AS A PERCENTAGE OF TOTAL CASH OUTLAYS BY FARM SIZE: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	0.0	0.0
1961	0.0	0.0	0.0
1962	0.0	0.0	0.0
1963	4.06292	0.0	5.51116
1964	23.58351	17.93250	27.46683
1965	20.35156	23.64398	25.77629
1966	24.74261	31.88666	27.28156
1967	16.30285	24.85899	16.63445
1968	0.0	18.75037	24.74339
1969	5.05933	40.24658	48.17041
1970	12.88688	55.69518	69.64063

SOURCE: MODEL RESULTS

TABLE D3: AVERAGE CREDIT USE/LABOR HOUR RATIOS BY FARM SIZE(IN CONSTANT 1970 CR$/HR): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	0.0	0.0
1961	0.0	0.0	0.0
1962	0.0	0.0	0.0
1963	0.03962	0.0	0.63852
1964	0.17125	0.76693	2.95967
1965	0.16453	1.16288	3.39936
1966	0.19801	2.01989	3.84617
1967	0.06160	1.32542	2.04895
1968	0.0	0.98307	3.54248
1969	0.02524	2.55147	7.83581
1970	0.05249	2.79967	10.24030

SOURCE: MODEL RESULTS

TABLE D4: AVERAGE CREDIT USE PER HECTARE BY FARM SIZE (IN CONSTANT 1970 CR$/HR): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.0	0.0	0.0
1961	0.0	0.0	0.0
1962	0.0	0.0	0.0
1963	2.50914	0.0	5.03719
1964	12.14240	12.73495	22.93477
1965	12.61318	22.86534	26.85497
1966	17.01550	34.08128	30.45039
1967	5.92801	22.67973	16.35843
1968	0.0	17.04109	29.38830
1969	3.05707	44.75575	66.73596
1970	7.18128	49.62820	90.78040

SOURCE: MODEL RESULTS

E. INCOME DISTRIBUTION

DEFINITIONS USED:

Average Gross Farm Income (t) =
Gross Revenue (t) / Number of Farms (t): [Table E1]

Average Net Farm Income (t) =
{Gross Revenue (t)-Total Cost (t)} / Number of Farms (t): [Table E2]

SMALL FARM = Small farms with 0∿50 hectares
MEDIUM FARM = Medium farms with 51∿300 hectares
LARGE FARM = Large farms with above 300 hectares

Remarks: Data on number of farms is presented in the Section F.

TABLE E1: AVERAGE GROSS FARM INCOME (IN 1000 CR$ AT 1970 PRICES) WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1.60251	16.88405	58.08542
1961	1.57745	16.67152	58.16742
1962	1.55742	16.77263	59.35413
1963	1.55447	17.00060	61.24211
1964	1.55749	17.38893	63.58951
1965	1.55355	18.06824	64.04236
1966	1.57707	18.57657	64.15712
1967	1.61167	18.51241	63.03705
1968	1.65933	18.45760	69.51994
1969	1.71319	19.75566	76.89293
1970	1.77262	19.58929	82.41331

SOURCE: MODEL RESULTS

TABLE E2: AVERAGE NET FARM INCOME (IN 1000 CR$ AT 1970 PRICES) WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1.03024	8.01429	10.32960
1961	1.00792	9.26495	14.34405
1962	0.99206	9.31510	13.07555
1963	0.98691	8.94457	13.79291
1964	0.98533	8.84511	14.19994
1965	0.98515	8.72220	15.83216
1966	0.99625	8.81925	16.26476
1967	1.01495	8.97451	16.38911
1968	1.04197	8.72554	14.62035
1969	1.07256	8.22361	14.91901
1970	1.10686	8.97523	16.35735

SOURCE: MODEL RESULTS

TABLE E3: AVERAGE GROSS RETURNS TO AVAILABLE FAMILY LABOR PER HOUR BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.53525	6.22614	23.86992
1961	0.53891	6.28822	24.44861
1962	0.54422	6.47038	25.52203
1963	0.55578	6.76880	26.76556
1964	0.56940	7.01862	28.59843
1965	0.58093	7.45929	29.46367
1966	0.60319	7.89450	30.19200
1967	0.63032	7.96537	30.79639
1968	0.66398	8.15449	34.22751
1969	0.70120	8.92749	38.66666
1970	0.74210	9.05387	42.40213

SOURCE: MODEL RESULTS

TABLE E4: AVERAGE NET RETURNS TO AVAILABLE FAMILY LABOR PER HOUR BY FARM SIZE (IN 1000 CR$ AT 1970 PRICES): WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	0.34411	2.95533	4.24490
1961	0.34434	3.49459	6.02901
1962	0.34666	3.59349	5.62256
1963	0.35286	3.52972	6.02812
1964	0.36022	3.57011	6.38621
1965	0.36838	3.60687	7.28383
1966	0.38104	3.72418	7.65411
1967	0.39695	3.86148	8.00681
1968	0.41695	3.85490	7.19820
1969	0.43899	3.71621	7.50223
1970	0.46338	4.14822	8.41595

SOURCE: MODEL RESULTS

TABLE E5: AVERAGE NET FARM INCOME BY FARM SIZE AS A PROPORTION OF SMALL FARMS' AVERAGE NET FARM INCOME: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1.0	7.78	10.02
1961	1.0	9.19	14.23
1962	1.0	9.39	13.18
1963	1.0	9.06	13.98
1964	1.0	8.98	14.41
1965	1.0	8.85	16.07
1966	1.0	8.85	16.22
1967	1.0	8.84	16.15
1968	1.0	8.84	14.03
1969	1.0	7.67	13.90
1970	1.0	8.11	14.78

SOURCE: MODEL RESULTS

TABLE E6: AVERAGE NET RETURNS TO AVAILABLE FAMILY LABOR PER HOUR BY FARM SIZE AS A PROPORTION OF SMALL FARMS' AVERAGE NET RETURN TO AVAILABLE FAMILY LABOR PER HOUR: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARM	MEDIUM FARM	LARGE FARM
1960	1.0	8.58	12.34
1961	1.0	10.15	17.31
1962	1.0	10.36	16.22
1963	1.0	10.00	17.08
1964	1.0	9.91	17.73
1965	1.0	9.77	19.77
1966	1.0	9.77	20.09
1967	1.0	9.73	20.17
1968	1.0	9.25	17.26
1969	1.0	8.47	17.09
1970	1.0	8.95	18.16

SOURCE: MODEL RESULTS

F. EXOGENOUS DATA USED IN THE MODEL

This section lists the exogenous data on factor and product prices used to estimate the model, and the data on farm size distribution used to estimate farm income distrioutions.

1) Price Vectors of Outputs and Inputs

2) Number of Farms and Farm Size Distribution

SMALL FARM = Small farms with 0~50 hectares
MEDIUM FARM = Medium farms with 51~300 hectares
LARGE FARM = Large farms with above 300 hectares

TABLE #1: PRICE VECTORS OF OUTPUTS AND INPUTS IN THE WHEAT REGION OF SOUTHERN BRAZIL (1960-1970)

Year	Wheat Cr$/kg	Soybean Cr$/kg	Corn Cr$/kg	Beef Cr$/kg	Labor Hiring Cr$/hr.	Tractor Cr$/unit (50 hp)	Combine Cr$/unit	Trans. cost Cr$/10 kg	Gas & Oil for Tractor Cr$/hr.	Gas & Oil for Combine Cr$/hr.	Fert. for wheat & soybns Cr$/kg	Fert. for Rice Cr$/kg	Bone Meal Cr$/kg	Salt Cr$/kg	Seed for Sum. Past. Cr$/kg (Pensacola, Bahia)	Seed for Win. P. Oats (ryegrass) Cr$/kg.	Seed for Wheat Cr$/kg	Seed for Soybn Cr$/kg	Seed for Corn Cr$/kg	Interest of Saving	Interest of Credit	Draft Animal Unit Cr$/unit	Wholesale Agri. Price Index
1960	.0154	.022	.0057*	0.072	.025	876*	2220*	.0035	.11*	.28*	.011*	.010*	.012*	.005*	.016*	.062	.025	.016	.03	.06	.10	13.5	100.0
1961	.0224	.0132	.0076*	0.104	.040	1135*	2820*	.005*	.18*	.44*	.022*	.020*	.019*	.007*	.024*	.096	.034	.019	.038	.06	.10	17.5	137.46
1962	.0400	.0185	.015*	0.173	.056	1717*	4320*	.007*	.23*	.50*	.039*	.035*	.031*	.011*	.039*	.154	.060	.025	.075	.06	.10	26.4	214.11
1963	.0647	.0332	.017*	0.291	.091	2907*	7260*	.014*	.45*	1.11*	.068*	.062*	.069*	.026*	.087*	.348	.097	.049	.085	.06	.10	44.7	333.33
1964	.1446	.0552	.0[illegible]*	0.533	.183	5053*	12660*	.020*	.86*	2.15*	.137*	.124*	.114*	.043*	.144*	.562	.217	.099	.200	.06	.10	77.7	745.74
1965	.2060	.1[illegible]	.0607	0.627*	.300	8416*	21180*	.050*	1.63*	4.08*	.252*	.228*	.158*	.059*	.198*	.790	.309	.160	.250	.06	.10	129.5	992.7
1966	.2540*	.1[illegible]	.1036	0.721*	.382	10233*	25560*	.060*	1.96*	4.87*	.252*	.225*	.220*	.082*	.276*	1.202	.381	.235	.542	.06	.10	157.0	1178.33
1967	.3005	.221[illegible]	.1150	0.815*	.479	13054*	32640*	.074*	2.41*	6.00*	.263*	.238*	.190*	.071*	.238*	.952	.450	.332	.640	.06	.10	200.0	1472.0
1968	.3635*	.25[illegible]*	.1351*	0.849*	.588	16055*	40140*	.091*	2.96*	7.36*	.346*	.313*	.213*	.081*	.267*	1.066	.545	.396	.676	.06	.10	247.0	1909.9
1969	.4265	.32[illegible]	[illegible]*	0.9[illegible]*	.708	20143*	50340*	.119*	3.87*	9.62*	.396*	.356*	.312*	.117*	.391*	1.562	.540	.461	.713	.06	.10	310.0	2506.08
1970	.4900	.35[illegible]	.15[illegible]	1.20	.[illegible]	24000	60000	.14	4.55	11.32*	.420*	.380	.40*	.150	.50*	2.0	.735	.525	.750	.06	.10	366.0	3430.65

SOURCE: A) All non-starred figures are from:**
(1) "Anuario Estatistico do Brasil," 1960-1970.
(2) "Anuario Estatistico do Trigo," 1965-1969.
(3) "Conjuntura Economica," 1960-1971.
(4) "Anuario Agro-Pecuario," 1960-1969.
(5) "Anuario Estatistico do Rio Grande do Sul," 1970.
(6) "Projections of Supply and Demand for Agricultural Products in Brazil through 1975."

** The items (1) through (5) are Brazilian statistical publications. The item (6) is published by the Economic Research Service, U.S.D.A. All the figures are nominal prices.

B) All starred figures are estimated based on the various price indices contained in "Desenvolvimento de Agricultura Paulista, 2 Vol.," Institute do Economia Agricola, Sao Paulo, Brasil.

C) The Wholesale Agricultural Price Index in the Sao Paulo region is used. Source: Conjuntura Economica, Vol. 17, No. 9, 1970, p. 91.

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TABLE F2: FARM SIZE DISTRIBUTION IN THE PLANALTO MEDIO AND MISSOES REGIONS (WHEAT REGIONS) OF SOUTHERN BRAZIL IN 1967

CLASS BY HECTARES	NUMBER OF FARMS	TOTAL FARM AREA	% OF FARM AREA	AREA EXPLOITED
0 ∿ 10	27,479	146,995	2.56	135,771
10 ∿ 25	37,575	661,771	11.53	617,384
25 ∿ 50	15,807	572,528	9.98	541,606
50 ∿ 100	7,485	528,153	9.20	506,092
100 ∿ 1,000	7,558	2,154,996	37.41	2,112,646
1,000 ∿ 10,000	729	2,58 ,101	27.56	1,557,784
10,000 ∿ 100,000	4	8 ,641	1.56	49,280
Above 100,000	—	—		—
Total	96,641	5,735,145	100	5,520,565
% of the State of Rio Grande do Sul	(18.55%)	(23.52%)		(23.82%)

SOURCE: Estrutura Fundiaria do Rio Grande do Sul — Instituto Brasileiro de Reforma Agraria Delegira Regional do Rio Grande do Sul — Also see Norman Rack, op. cit. (1971, p. 24-30).

TABLE F3: ESTIMATED NUMBER OF FARMS: WHEAT REGION IN THE STATE OF RIO GRANDE DO SUL, SOUTHERN BRAZIL (1960-1970)

YEAR	SMALL FARMS	MEDIUM FARMS	LARGE FARMS	REGIONAL FARMS
1960	60121	8404	3304	71829
1961	62724	8768	3447	74939
1962	65440	9147	3597	78184
1963	68296	9544	3729	81569
1964	71230	9957	3914	85101
1965	74314	10388	4084	88786
1966	77531	10838	4261	92630
1967	80865	11264	4512	96641
1968	84391	11797	4638	100826
1969	88046	12308	4838	105192
1970	91858	12840	5049	109747

SOURCE: The data for 1960 and 1967 are from 1) Brazil, IBGE - Servico Nacional de Recenseamento, Censo Agricole de 1960: Rio Grande do Sul, and 2) Estrutura Fundiaria do Rio Grande do Sul (see Table F2). For the remaining years, an exponential growth rate in number of farms with fixed inter-farm ratios is assumed: From 71829 $(1+r)^7$ = 96641, r=0.0433.