

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20521 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY
---	-------------------------

1. SUBJECT CLASSIFICATION	A. PRIMARY	Development and economics	DA00-0000-C748
	B. SECONDARY	General--Taiwan	

2. TITLE AND SUBTITLE
 Factor content of consumption by income size: some further evidence

3. AUTHOR(S)
 Ho, Yhi-Min

4. DOCUMENT DATE 1978	5. NUMBER OF PAGES 34p.	6. ARC NUMBER ARC
--------------------------	----------------------------	----------------------

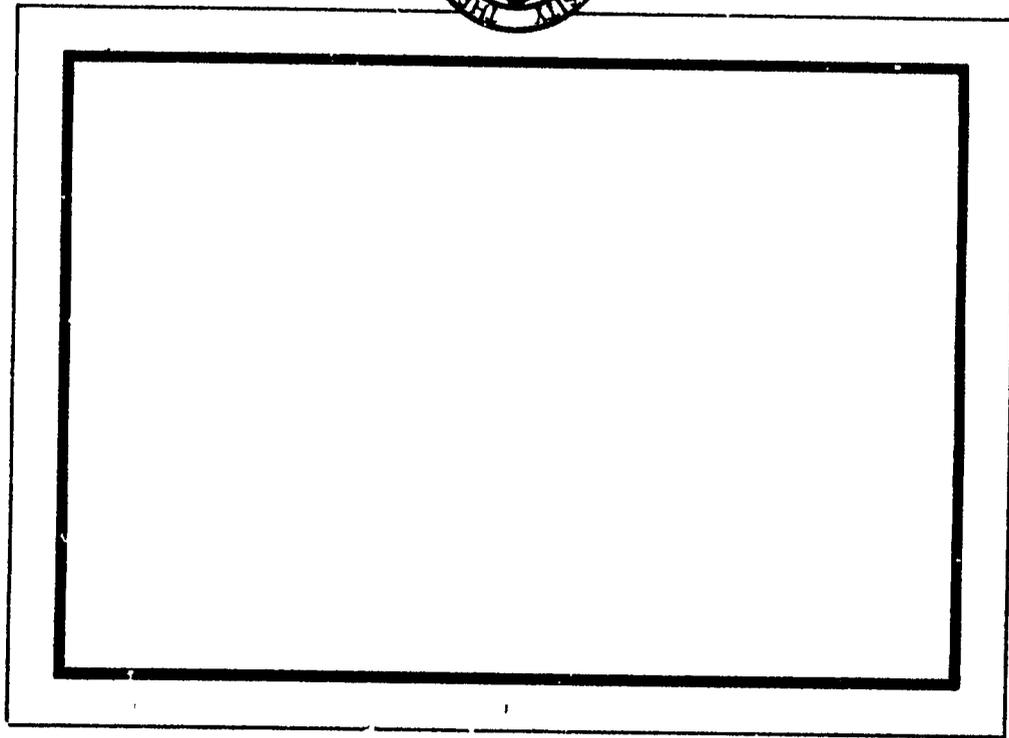
7. REFERENCE ORGANIZATION NAME AND ADDRESS
 Rice

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)
 (In Program of Development Studies. Paper no.90)

9. ABSTRACT

10. CONTROL NUMBER PN-AG-411	11. PRICE OF DOCUMENT
12. DESCRIPTORS Consumption Income distribution Factor analysis Technological change Taiwan	13. PROJECT NUMBER 931052000
	14. CONTRACT NUMBER AID/otr-C-1394 Res.
	15. TYPE OF DOCUMENT

RICE UNIVERSITY
Houston, Texas



Program of Development Studies

PROGRAM OF DEVELOPMENT STUDIES
121 Sewall Hall
WILLIAM MARSH RICE UNIVERSITY
Houston, Texas 77001

Paper No. 90

Factor Content of Consumption by Income Size:
Some Further Evidence

by

Yhi-Min Ho

Winter, 1978

The author is Professor and Chairman of Economics at the University of St. Thomas. The research reported in this paper is related to Agency for International Development contract AID/otr-C-1394 on "Distribution of Gains, Wealth and Income from Development."

Program Discussion Papers are preliminary materials circulated to stimulate discussion and critical comment. References in publications to Discussion Papers should be cleared with the authors to protect the tentative character of these papers.

Factor Content of Consumption by Income Size:
Some Further Evidence

Abstract

This paper, as one of a series of studies on the interactions between income redistribution, consumer demand and factor employment using the Taiwan experience further examines the validity and sensitivity of the hypothesis that the consumption pattern of the poor is more labor-intensive than that of the rich. The purpose of the paper is to assess whether contradictory findings relating to the factor-intensity proposition may be explained by differences in the degree of aggregation of consumption and production data. The hypothesis is tested using disaggregated production data on the basis of a two-way classification of manufacturing firms by size. The paper also analyzes the sensitivity of the factor content of consumer demand to changes in technology and income distribution.

Findings obtained through simulations refute the hypothesis that the poor's consumption mix has a higher employment content. The findings, while reinforcing an earlier and similar finding reported elsewhere, appear to be invariant with respect to technological and distributional changes. On the whole, they suggest that the factor content of consumption is itself a function of the developmental process.

Factor Content of Consumption by Income Size:
Some Further Evidence

1. Introduction

In a previous study analyzing the interactions between income redistribution and factor demand using data for Taiwan,¹ I reported that income redistribution, from the rich to the poor, would increase capital requirements relative to demand for labor in order to meet the new final demand. The finding thus rejects the a priori hypothesis that the composition of consumption by the poor is more labor-intensive than that by the rich;² and the finding is at variance with other findings from similar studies on Turkey, Colombia and Pakistan that Soligo and others have reported.³

The issue regarding the factor intensity of consumption by different income groups is not a trivial one. By now it is well-known that the distribution of income in the developing nations is typically unequal. More-

¹Yhi-Min Ho, "Income Redistribution and Its Effects on Factor Demand in Taiwan: A Simulation Approach," Southern Economic Journal, Vol. 43, No. 2 (October, 1976), pp. 1017-1030.

²See James W. Land and Ronald Soligo, "Income Distribution and Employment in Labor Redundant Economies," Philippine Economic Journal, No. 1 (1974), pp. 57-82; Dudley Seers, Towards Full Employment: A Programme for Colombia (Geneva: International Labour Office) 1970.

³Ronald Soligo, "Factor Intensity of Consumption Patterns, Income Distribution and Employment Growth in Pakistan," Program of Development Studies Discussion Paper No. 44, Rice University, 1973; Tuncay M. Sunman, "Short-run Effects of Income Distribution on some Macro-Economic Variables: The Case of Turkey," Program of Development Studies Discussion Paper No. 67, Rice University, 1975. A summary discussion of the methodology used and evidence obtained from recent research on this issue may be found in Ronald Soligo, "Consumption Patterns, Factor Usage and the Distribution of Income: A Review of Some Findings," paper presented to the 1974 Southern Economic Association Meetings, Atlanta, Georgia, November 14-16, 1974.

over, in the process of development the degree of income inequality typically increases in the Third World countries. The reason is largely that development projects and programs undertaken by developing nations are biased in favor of capital.¹ Thus, these programs and projects tend to heighten the existing degree of income inequality through a biased distribution of gains from development. If goods consumed by the poor require more capital than labor, a biased pattern of income distribution is perpetually interlocked in the interrelationship between the existing income distribution and final demand on the one hand and factor demand and income distribution on the other. The prospect that the direction of the distributional bias will reverse itself in the developing nations is remote indeed.

It is quite conceivable though that the uncovered inconsistency in empirical results with respect to the factor intensity issue may merely reflect differences in methodology, particularly with respect to the degree of disaggregation of consumption data, production data and input-output coefficients, that was available and attainable for the stated studies on Turkey, Colombia and Pakistan. One major area from which the stated inconsistency may arise is the aggregation of agricultural products. This commodity group is a major consumption category in the household budget in the developing nations. Therefore, quite possibly the level of disaggregation attained may be crucial in determining the direction of the empirical results reported.

¹See (1) Irma Adelman and Cynthia T. Morris, Economic Growth and Social Equity in Developing Countries (Stanford, California: Stanford University Press, 1973); (2) Manning Nash, ed., Essays on Economic Development and Cultural Change in Honor of Bert F. Hoselitz (Chicago: The University of Chicago Press, 1977), and (3) Edgar O. Edwards, Employment in Developing Nations: Report on a Ford Foundation Study (New York: Columbia University Press, 1974).

In fact, in the same paper in which the factor intensity findings were reported, I suggested that the reported results were quite sensitive in certain aspects. For example, the consumption pattern of the poor is capital-intensive, as suggested by the Taiwan study, if the services and other unidentified and unclassified items are included. However, the finding was reversed if these two major consumption categories are excluded.¹

To be sure, the sensitivity of factor content of consumption may not be confined only to problems involving commodity groupings, agricultural products or any other commodity group. In identifying factor content of consumption, it is generally assumed that each commodity is produced by firms with identical factor ratios regardless of their size. No doubt the assumption itself is an empirical question. In a different econometric study in which the production functions of the manufacturing sector were analyzed,² I found significant differences in factor utilization between firms of different sizes in the same census industry group. On the two-digit level of aggregation, evidence is sufficiently strong suggesting that factor proportions vary among firms due to differences in: (1) technical requirements of the existing technology, (2) in factor costs encountered and (3) in the elasticity of substitution between capital and labor.

In view of the importance of the factor intensity issue in the analytical framework of investigating the interaction between factor demand, consumption patterns and income distribution, the compositional effect of

¹Yhi-Min Ho, "Income Redistribution."

²Yhi-Min Ho, "The Production Structure of the Manufacturing Sector and Its Distributional Implications: The Case of Taiwan," Economic Development and Cultural Change (forthcoming).

income redistribution needs to be more systematically tested. The present paper attempts to test the sensitivity of factor content of consumption by various income classes from three aspects: (1) variation in factor content of consumption due to differences in the degree of aggregation of agricultural products, (2) variation in factor content of consumption due to differences in the degree of aggregation of production units, and (3) variation in factor content of consumption due to differences in aggregation of input-output coefficients.

2. The Methodology

The Model

In order to generate results that are comparable to those previously reported, I follow the same methodology and retain the same notations developed in the stated study.¹

Let C_{ij} be the consumption of the j th product by households in the i th income class, k_j and l_j the capital and labor requirements of the j th product, respectively. Total capital and labor requirements, defined as K_i and L_i , for the production of C_{ij} , can now be written as:

$$[C_{i,j}] \cdot \{k_j\} = \{K_i\} \quad (1.1)$$

$$[C_{i,j}] \cdot \{l_j\} = \{L_i\} \quad (1.2)$$

In the above equations, [] represents a matrix, and { } a vector, of appropriate orders.

Per household change in $C_{i,j}$ may come either from changes in the number

¹Yhi-Min Ho, "Income Redistribution."

of households in the i th income class or from changes in total income received by the i th income class with the number of households given. The relationship between income and consumption changes is defined as:

$$\Delta C'_{i,j} = \rho_{i,j} \cdot \Delta y'_i \quad (1.3)$$

$$\text{where } \rho_{i,j} = \frac{C'_{i+1,j} - C'_{i,j}}{-v'_i} \cdot \frac{C'_i}{C'_{i,j}}$$

In the expression, $\Delta y'_i$ represents the change in income per household of the i th income class, $C'_{i,j}$, the consumption of the j th commodity per household for households in the i th income class, and C'_i , total consumption spending per household for the i th income class. $\rho_{i,j}$ may be viewed as the expenditure elasticity of the j th commodity for the i th income class; the expenditure elasticity so defined is equivalent to the conventional income elasticity weighted by the average propensity to consume of the i th income class.

The overall changes in the consumption of all products by all households can be derived from the following:

$$[\rho_{i,j}]' \cdot \{\Delta Y'_i\} = \{\Delta C_j\}. \quad (1.4)$$

In equation (1.4), $[\rho_{i,j}]'$ is the transposed matrix $[\rho_{i,j}]$ of order 31×76 ; $\{\Delta Y'_i\}$ is a column vector of order 31, representing changes in household income for the i th income class, and $\{\Delta C_j\}$, a column vector of order 76, defining changes in the consumption of the j th product.

Changes in overall production through interindustry interdependency can be measured by the following:

$$[a_{i,j}] \cdot \{\Delta C_j\} = \{\Delta \lambda_j\} \quad (1.5)$$

In (1.5), $[a_{i,j}]$ is the interindustry interdependency coefficient matrix of

order 76×76 ; and $\{\Delta X_j\}$, output change for the j th industry.

Increments in capital and labor requirements due to income changes can now be obtained from the following two equations:

$$\{k_j\} \cdot \{\Delta X_j\} = K \quad (1.6)$$

$$\{l_j\} \cdot \{\Delta X_j\} = L \quad (1.7)$$

Description of the Computations

(1) Sensitivity test with respect to the aggregation of agricultural products

In the above-mentioned study of the factor content of consumption using data for Taiwan,¹ I was able to identify nine farm product groups, whereas most other similar studies grouped all farm products as one. For the purpose of testing the sensitivity of the empirical results from my previous study to the degree of aggregation, a similar computation was performed using a weighted average of capital-labor ratios for all agricultural products, as compared with the previous computation in which a capital-labor ratio was identified for each of the nine farm products: rice, other common crops, sugar cane, other cash crops, horticultural products (including vegetables and fruits), hogs, other livestock products, forestry products and fishing products.

(2) Sensitivity test with respect to the aggregation of production units

As stated in Section 1, the econometric study of the production functions of the manufacturing sector of Taiwan suggests significant differences in factor combinations because of size.² In that study, firms in each of the

¹Yhi-Min Ho, "Income Redistribution."

²Yhi-Min Ho, "Production Functions."

nine two-digit industries identified are divided into three size groups. Manufacturing establishments with a total of 50 or more employees were classified as large firms, between 10 and 49, medium firms, and under 10, small firms. To establish the bounds of factor intensity of consumption patterns, simulations are performed by assuming that, (1) all non-agricultural products are produced by firms with capital-labor ratios identical to those used by large-sized establishments, and (2) all non agricultural goods are produced by firms with capital-labor ratios identical to that used by small-sized firms.

- (3) Sensitivity test with respect to the aggregation of input-output coefficients

Again, in the stated study of factor intensity of consumption for the year 1966 in Taiwan, the impact of income redistribution on final demand and on factor requirements included both direct and indirect, through interindustry dependency, changes. The input-output table for Taiwan in 1966 contains 76 industries, in addition to the final demand sector, whereas the input-output table for Taiwan in 1964 contains 55 industries. Thus, a series of simulations may be performed to identify: (1) the effects on factor content and factor requirements if the 1964 input-output coefficients are mapped into the pattern of income distribution and the factor ratios for 1966, (2) the effects on factor content and requirements for 1966 if the pattern of income distribution for 1964 had prevailed, and (3) the effects on factor content and requirements for 1966 if the factor ratios for 1964 had prevailed.

Through these series of simulations, it is possible to estimate the relative importance, in terms of the impact on factor demand, of changes in input-output relations, in technology and in household composition and income.

The Data

Data on household composition and income and on household expenditures are compiled from Report on the Survey of Family and Expenditure in Taiwan, a biannual economy-wide survey published by the Bureau of Accounting and Statistics, Taiwan Provincial Government. In the initial 1964 survey, a sample of 3,000 households were surveyed and interviewed; the households were selected through a well-designed stratified sampling method. The survey and interviews were supplemented by information developed through book-keeping records of 600 households that were selected from the sample of 3,000 to keep a daily financial record. The same sampling techniques and data-collecting procedures were followed in 1966, except that the number of book-keeping households was reduced from 600 to 400.

This biannual consumer survey provides a comprehensive amount of information on the pattern of income distribution as well as the pattern of household consumption by income size, by occupation and by household location. In the initial 1964 survey, only 20 expenditure categories were identified; the second 1966 biannual survey expanded the number of expenditure categories to 50. (See Table 1.) In the 1964 survey, households were classified into 32 income classes, with the lowest income class receiving an annual income under NT\$6,000 and the highest income class with an annual income over NT\$300,000. In the 1966 survey, the number of income classes was reduced to 31 by defining the highest income class as those receiving an annual income over NT\$200,000. (See Table 2.)

Data on factor ratios of non-farm products are estimated and compiled from the General Report on the Third (1966) Industrial and Commerce Census

TABLE 1: Consumption Items Identified in the Household
Income and Expenditure Surveys, 1964 and 1966

1964 Survey	1966 Survey
1. Staple food	1. Rice 2. Flour 3. Sweet potatoes 4. Other cereals
2. Supplementary food	5. Milk 6. Supplementary food 7. Condiments 8. Food in restaurants 9. Food for family celebrations 10. Marriages, births, and funerals (food)
3. Beverage	11. Non-alcoholic 12. Alcoholic
4. Tobacco	13. Tobacco
5. Clothing	14. Men's apparel 15. Women's apparel 16. Children's apparel 17. Jewelry and ornaments
6. Rent	18. Actual rent 19. Imputed rent
7. Household repairs	20. Household repair and installation
8. Water charges	21. Water charges
9. Lighting	22. Lighting
10. Fuels	23. Charcoal 24. Coal 25. Kerosene 26. Gas 27. Firewood 28. Refuse of agriculture 29. Other fuels
11. Furniture and appliances	30. Furniture and furnishings 31. Textile furnishings 32. Appliances for kitchen and bath 33. Other household equipment

TABLE 1--continued

1964 Survey	1966 Survey
12. Domestic servants	36. Domestic servants
13. Other household expenses	35. Other household operation expenses
14. Personal and health care	36. Personal care
	37. Barber and bath shop service
	38. Medical and health expenses
15. Purchase and operation of transportation	39. Purchase of personal transport equipment
	40. Operation of personal transport equipment
16. Purchased transportation	41. Purchased transportation
17. Communications	42. Other transport and communications
18. Recreation and amusement	43. Recreation
	44. Books, newspapers, magazines and stationery
	45. Other recreation and amusement items
19. Research and education	46. Education and research
20. Other miscellaneous expenses	47. Financial service
	48. Marriage, birth and funeral expenses
	49. Other miscellaneous items
	50. Interest

TABLE 2: Income Distribution of Taiwan, 1964 and 1966

Size of Income	1964		1966	
	Total Income (in millions of NT\$)	Number of Households (in 1,000)	Total Income (in millions of NT\$)	Number of Households (in 1,000)
Under NT\$6,000	97.6	22.8	62.4	13.0
6,000-8,000	318.8	45.3	273.5	36.2
8,000-10,000	458.8	51.0	533.3	54.6
10,000-12,000	955.0	87.0	710.8	61.4
12,000-14,000	1,471.9	113.6	1,505.1	110.0
14,000-16,000	1,960.1	130.1	1,761.2	112.6
16,000-18,000	2,245.0	132.3	2,321.1	131.6
18,000-20,000	2,664.4	140.9	2,799.5	141.8
20,000-22,000	3,226.0	153.8	3,570.0	165.1
22,000-24,000	3,325.1	144.5	3,254.5	137.2
24,000-26,000	3,194.8	128.0	3,512.0	138.4
26,000-28,000	3,794.0	140.9	3,407.4	122.9
28,000-30,000	3,061.4	105.6	3,693.0	125.9
30,000-32,000	2,469.1	79.8	3,228.0	101.8
32,000-34,000	2,586.5	78.4	2,732.2	81.2
34,000-36,000	2,664.5	76.2	2,671.4	75.1
36,000-38,000	2,335.6	63.3	2,770.2	73.4
38,000-40,000	1,684.0	43.1	2,194.4	55.9
40,000-45,000	4,248.3	100.6	5,214.6	118.6
45,000-50,000	3,467.6	73.3	4,135.6	84.4
50,000-55,000	2,631.6	50.3	3,958.1	73.2
55,000-60,000	2,558.5	44.8	3,328.1	56.5
60,000-65,000	1,930.6	30.9	3,145.1	49.4
65,000-70,000	1,447.3	21.6	1,861.4	27.2
70,000-75,000	1,242.8	17.2	1,774.9	23.9
75,000-80,000	1,054.6	13.7	1,464.8	18.6
80,000-90,000	1,687.2	20.1	2,358.1	26.9
90,000-100,000	1,293.4	13.7	1,640.5	16.6
100,000-150,000	2,819.1	23.0	3,944.0	33.1
150,000-200,000	722.4	4.3	1,712.0	9.8
Over 200,000	740.6	2.1	957.8	4.3

Sources: Simplified from Directorate-General of Budgets, Accounts and Statistics, Report on the Survey of Family Income and Expenditure Study of Personal Income Distribution in Taiwan, 1964 (Taiwan: Directorate-General of Budgets, Accounts and Statistics, December, 1966), p. 132; and Bureau of Accounting and Statistics, Report on the Survey of Family Income and Expenditure in Taiwan, 1966 (Taiwan: Taiwan Provincial Government, June, 1968), pp. 74-75.

of Taiwan, Republic of China, supplemented by information shown in the Report on Industrial and Commercial Survey, an annual survey published by the Ministry of Economic Affairs. The general census covers six sectoral surveys of mining, manufacturing, construction, electricity, gas and water supply, commerce and other business. For the manufacturing sector the census contains 112 industry classifications. The degree of disaggregation is comparable to the 3-digit industry groupings defined in the U.S. Census of Manufacturing. The annual surveys are less comprehensive; nevertheless, the coverage and classifications are comparable to those found in the census report.

Estimate of factor requirements of farm products are made from data shown in the series of Cost Surveys of Farm Products and Reports of Farm Record-keeping Families in Taiwan, both published by the Department of Agriculture and Forestry, Provincial Government of Taiwan.

The input-output tables are those compiled and published by the Council for International Economic Cooperation and Development, Executive Yuan, Republic of China. The published series of input-output tables contains 15 sets of tables identifying interindustry transactions, input coefficients and interindustry interdependency, as well as domestic interindustry transactions, domestic input coefficients and domestic interindustry interdependence. The 1964 input-output series have 55 industry entries and 5 final demand categories. The 1966 input-output series has a higher degree of disaggregation: there are 76 industry entries in the series. (See Tables 3 and 4.)

Finally, I note that the factor intensity issue is as much a methodological issue as an issue of substance. Thus, the methodology used and the definitions adopted may very well determine the empirical results. In this study, I define the capital intensity as the ratio of the year-end total

TABLE 3: Capital/Output and Labor/Output Ratios
of 55 Major Products of Taiwan, 1964

Input-Output Identification	Commodity	Capital/ Output	Labor/ Output
01	Rice	1.2450	0.0470
02	Other common crops	1.3664	0.0501
03	Sugar cane	1.1183	0.0649
04	Crops for processing	2.9970	0.0820
05	Misc. horticultural crops	2.5232	0.1610
06	Hogs	2.5903	0.0597
07	Other livestock	0.9561	0.0305
08	Forestry	6.0330	0.0151
09	Fisheries	1.2774	0.0850
10	Coal	0.8846	0.0419
11	Metallic minerals	3.4504	0.0336
12	Crude petroleum and natural gas	2.8118	0.0736
13	Salt	1.1946	0.0538
14	Non-metallic minerals	2.8118	0.0736
15	Sugar	3.1716	0.0094
16	Canned pineapples	2.4007	0.0394
17	Canned mushrooms	2.4007	0.0394
18	Miscellaneous canned food	2.4007	0.0394
19	Tobacco	2.6400	0.0126
20	Alcoholic beverages	2.6400	0.0126
21	Sodium glutamate	7.2170	0.0213
22	Misc. food and non-alcoholic beverages	4.5848	0.0099
23	Artificial fibre	4.5968	0.0355
24	Textiles	4.5696	0.0348
25	Lumber and plywood	1.5824	0.0182
26	Products of wood, bamboo and rattan	2.7598	0.0207
27	Pulp, paper and products	3.8321	0.0222
28	Leather and products	4.0626	0.0193
29	Rubber and products	2.5396	0.0302
30	Chemical fertilizers	3.6748	0.0052
31	Medicines	2.1802	0.0103
32	Plastics and products	2.5647	0.0171
33	Petroleum products	2.7320	0.0066
34	Other chemical products	2.1802	0.0103
35	Cement	3.1642	0.0063
36	Cement products	3.1642	0.0063
37	Glass and products	3.9026	0.0182
38	Misc. non-metallic mineral products	2.4689	0.0638
39	Iron and steel	6.7866	0.0292
40	Iron and steel products	1.1062	0.0049

TABLE 3--continued

Input-Output Identification	Commodity	Capital/ Output	Labor/ Output
41	Aluminum	4.6376	0.0184
42	Aluminum products	4.6376	0.0184
43	Misc. metallic products	6.7866	0.0292
44	Machinery	3.1354	0.0378
45	Electric machinery and supplies	2.7100	0.0378
46	Transportation equipment	2.4052	0.0136
47	Misc. manufactures	3.4815	0.0475
48	Construction	0.2434	0.0431
49	Electricity	9.0808	0.0053
50	Gas	4.1604	0.0153
51	City Water	5.5403	0.0134
52	Transportation	14.3445	0.0272
53	Communications	4.7483	0.0167
54	Misc. services	1.3315	0.1859
55	Undistributed	0.5770	0.0785

Sources: Compiled from data shown in (1) Ministry of Economic Affairs and Council for International Economic Cooperation and Development. Report on Industrial Surveys in Taiwan (Taipei: Ministry of Economic Affairs and Council for International Economic Cooperation and Development), various issues; (2) Department of Agriculture and Forestry, Provincial Government of Taiwan, Cost Surveys of Farm Products in Taiwan (Taiwan: Department of Agriculture and Forestry, Provincial Government of Taiwan), various issues; and (3) Department of Agriculture and Forestry, Provincial Government of Taiwan, Report of Farm Record-keeping Families in Taiwan (Taiwan: Department of Agriculture and Forestry, Provincial Government of Taiwan), various issues.

TABLE 4: Capital/Output, Labor/Output Ratios
of 76 Major Products in Taiwan, 1966+

Input- Output Table Entry	Commodity	Capital/Output			Labor/Output
		Firm size			
		Mixed	Large	Small	
01	Rice	1.2352	1.2352	1.2352	0.0517
02	Other common crops	1.3916	1.3916	1.3916	0.0565
03	Sugar cane	0.9396	0.9396	0.9396	0.0604
04	Crops for processing	2.6672	2.6672	2.6672	0.0809
05	Misc. horticultural crops	1.3482	1.3482	1.3482	0.0683
06	Hogs	1.8450	1.8450	1.8450	0.0998
07	Other livestock	1.8450	1.8450	1.8450	0.0265
08	Forestry	3.9626	3.9626	3.9626	0.0099
09	Fisheries	1.0022	1.0022	1.0022	0.0666
10	Coal and products	1.4196	1.4250	1.7500	0.0500
11	Metallic minerals	1.5912	1.6495	0.3699	0.0137
12	Crude petroleum	3.1824	3.1824	3.1850	0.0900
13	Natural gas	3.1824	3.1824	3.1860	0.0900
14	Salt	1.3194	1.3194	1.3192	0.0559
15	Non-metallic minerals	1.4962	1.6569	1.6958	0.0556
16	Sugar	4.7516	5.8560	2.2161	0.0183
17	Canned food	3.1437	3.9179	1.4814	0.0376
18	Tobacco	5.9039	7.8820	3.2830	0.0175
19	Alcoholic beverages	5.9039	5.9045	5.9045	0.0175
20	Monsodium glutamate	4.6455	5.7935	2.1922	0.0231
21	Wheat flour	2.7161	3.3866	1.2824	0.0103
22	Edible vegetable oil	6.1651	7.6890	2.9095	0.0275
23	Non-alcoholic beverages	1.3389	1.7860	0.7445	0.0198
24	Tea	1.3482	1.6802	0.6352	0.0683
25	Miscellaneous food	3.1779	3.9639	1.4987	0.0362
26	Artificial fibre	10,6391	11.8955	3.2343	0.0363
27	Artificial fabrics	5.8568	6.5376	1.7787	0.0363
28	Cotton fabrics	7.8157	8.7364	2.3741	0.0427
29	Woolen and worsted fabrics	6.6201	7.4005	2.0130	0.0244
30	Misc. fabrics & apparel, accs.	5.7325	6.3245	6.0221	0.0432
31	Lumber	3.5627	4.8078	1.6394	0.0178
32	Plywood	4.1754	5.6303	1.9205	0.0355
33	Products of wood, bamboo, rattan	1.8913	1.8974	2.0478	0.0716
34	Pulp, paper and paper products	3,4217	4.0309	1.5421	0.0244
35	Printing and publishing	2.1779	5.0223	1.5587	0.0249
36	Leather and products	6.4449	12.5759	3.3667	0.0598
37	Rubber and products	3.1653	3.8269	2.4921	0.0355
38	Chemical fertilizers	5.0893	6.8599	1.3302	0.0454
39	Medicines	2.3448	3.1602	0.6114	0.0229
40	Plastic and products	4.0701	5.4869	1.0868	0.0251

TABLE 4--continued

Input- Output Table Entry	Commodity	Capital/Output			Labor/Output
		Mixed	Firm size		
			Large	Small	
41	Petroleum products	2.5013	2.7039	0.1776	0.0046
42	Non-edible veg. & animal oils	6.1651	7.6890	2.9095	0.0275
43	Misc. industrial chemicals	3.6364	4.9011	0.9498	0.0173
44	Misc. chemical manufactures	3.4785	4.6863	0.9082	0.0205
45	Cement	3.0738	5.8006	0.6363	0.0058
46	Cement products	1.9268	3.6381	0.3997	0.0506
47	Glass and products	3.9648	7.4836	0.8218	0.0214
48	Misc. non-metallic mineral prod.	2.3896	4.5030	0.4898	0.0790
49	Steel and iron	5.5649	5.8483	2.3042	0.0251
50	Steel and iron products	2.4136	3.6998	1.4765	0.0342
51	Aluminum	4.4227	6.7807	2.7064	0.0228
52	Aluminum products	2.7642	4.2345	1.6923	0.0739
53	Misc. metallic products	2.1617	3.3140	1.3235	0.0517
54	Machinery	1.9757	3.4598	1.2058	0.0384
55	Household electrical appliances	2.9214	3.3490	1.2648	0.0340
56	Communication equipment	3.9753	4.5577	1.7207	0.0238
57	Other elec. apparatus & equip.	2.0148	2.3109	0.8718	0.0317
58	Ship building	2.6583	3.8976	1.5034	0.0348
59	Motor vehicles	3.4211	5.0160	1.9360	0.0275
60	Other transport equipment	2.0422	2.9930	1.1542	0.0398
61	Misc. manufactures	3.1594	3.4603	2.4778	0.0712
62	Residential building	1.3546	1.0986	4.8412	0.0931
63	Public construction works	1.3546	1.0986	4.8412	0.0931
64	Other construction	1.3546	1.0986	4.8412	0.0931
65	Electricity	9.6474	9.6474	9.6474	0.0076
66	Gas	13.4387	13.4389	13.4389	0.0301
67	City water	10.4752	11.9100	5.8955	0.0203
68	Water transportation	13.5565	15.7527	1.7898	0.0218
69	Land transportation	3.3745	3.3532	3.6360	0.0202
70	Air transportation	4.1464	4.1699	9.4604	0.0198
71	Warehousing	3.5563	5.5628	4.8936	0.0614
72	Communications	3.1845	3.1840	3.1840	0.0503
73	Wholesale and retail trade	0.5724	2.7422	0.4255	0.0591
74	Finance and insurance	0.5715	0.6968	0.0502	0.0335
75	Miscellaneous services	1.3315	3.1231	0.1487	0.1859
76	Undistributed	0.5770	1.3502	0.0628	0.0785

†Direct capital and labor inputs only.

Sources: (1) Data used to estimate capital/output and labor/output ratios of farm products are drawn from Cost Surveys of Farm Products in Taiwan

TABLE 4-- continued

(Taiwan, Department of Agriculture and Forestry, Provincial Government of Taiwan, 1973); and from Report of Farm Record-Keeping Families in Taiwan (Taiwan, Department of Agriculture and Forestry), various issues.

(2) Data for non-agricultural products are compiled from General Report on the Third (1966) Industrial and Commerce Census of Taiwan, Republic of China (Taiwan, Commission of Industrial and Commerce Census of Taiwan, 1968).

fixed assets in operation to gross output produced; total fixed assets in operation included factory land, buildings, machinery and equipment, inventory and cash assets. Labor-intensity is defined as the ratio of the number of employees per NT\$1,000 output measured in current prices. Factor ratio is defined as capital (per NT\$1,000) per employee.

Estimating factor requirements of farm products presents special problems because of the multiple-product nature of farm operation. For lack of any data on the allocation of labor time and agricultural capital among various products, factor requirements of major farm products can only be estimated by assuming that (1) competitive conditions prevail in farm product markets and the marginal principle operates, (2) labor time allocated among farm products is proportional to costs of labor, both actual and imputed, of various farm products, and (3) depreciation of farm buildings, tools and equipment assignable to various products is indicative of the allocation of total farm capital among various products.

4. The Findings

Recalling that the purpose of the study is to test the sensitivity of the factor content of consumption, by different income groups, to variations in the degree of aggregation, sensitivity tests are performed with respect to aggregation of (1) agricultural products, (2) production units of different sizes, and (3) input-output coefficients. To simplify the presentation, only the summaries of the findings are shown in Tables 5, 6, 7 and 8. The detail is relegated to the appendix.

In summarizing the results, I group the 31 income classes into two, the lower half and the upper half, taking the 16th income class as the

TABLE 5: Capital Content of Consumption by Sectors and by Income Size

Sector	Average Capital Content*	No. Higher than the Average	
		Lower Half	Upper Half
(Agricultural Products Disaggregated)			
All	36.8	12	6
Urban	36.9	12	4
Rural	36.5	11	8
(Agricultural Products Aggregated)			
All	38.4	12	5
Urban	38.6	12	4
Rural	37.8	7	7

*NT\$1,000 of capital per worker.

TABLE 6: Capital Content of Consumption Using Large-firm Technology

Sector	Average Capital Content*	No. Higher than the Average	
		Lower Half	Upper Half
(Agricultural Products Disaggregated)			
All	42.4	11	6
Urban	42.5	11	6
Rural	42.3	7	8
(Agricultural Products Aggregated)			
All	44.0	11	6
Urban	44.2	10	6
Rural	43.5	5	8

*NT\$1,000 of capital per worker.

TABLE 7: Capital Content of Consumption
Using Small-firm Technology

Sector	Average Capital Content*	No. Higher than the Average	
		Lower Half	Upper Half
(Agricultural Products Disaggregated)			
All	33.5	12	4
Urban	34.4	12	6
Rural	30.9	11	4

*NT\$1,000 of capital per worker.

TABLE 8: Capital Content of Consumption
By Various Experiments

	Experiment				
	I	II	III	IV	V
Mean Capital/Labor Ratio	36.8	39.5	36.8	48.6	33.0
	No. Higher Than The Mean				
Lower Half	12	15	12	3	12
Upper Half	6	4	6	13	1

dividing line. Tables 5, 6 and 7 show the number of income classes from each half whose capital content of consumption is higher than the capital content average for all income classes.

Table 8 presents the results of the following experiments:

Experiment I:

1966 Household expenditure pattern
1966 Factor ratios
1966 Input-output coefficients

Experiment II

1964 Household expenditure pattern
1964 Factor ratios
1964 Input-output coefficients

Experiment III

1966 Household expenditure pattern
1966 Factor ratios
1964 Input-output coefficients

Experiment IV

1964 Household expenditure pattern
1966 Factor ratios
1966 Input-output coefficients

Experiment V

1966 Household expenditure pattern
1964 Factor ratios
1966 Input-output coefficients

The results shown in the above 4 tables suggest several conclusions. First, they all support my previous finding that the composition of consumption by the poor is more capital intensive than that by the rich. Second, although the overall capital content of consumption is sensitive to the degree of aggregation of farm products, the degree of aggregation does not reverse the factor content between the rich and the poor. Third, the results reaffirm that consumption by the urban household is more capital intensive than its rural counterpart, and fourth, the factor content of consumption is basically determined by two major consumption items, namely,

food and services. The last finding in my view may be the major explanation of why empirical evidence on factor content of consumption varies and contradicts. This last point needs elaboration.

First, I note that when the 1964 household expenditure pattern is mapped with the 1966 factor ratios, the overall capital content of consumption for all income classes increases sharply, a result suggesting the dominating weight of food expenditure in the relative factor requirements. Perhaps more importantly, the direction of the capital content between the lower income and upper income classes is reversed (See Experiment IV in Table 8). The reversal can only be explained by the major differences in the proportion of income spent on food and on the miscellaneous and unidentified service items between 1964 and 1966 (see Table 9). Table 9 further suggests that the expenditure pattern for each survey year as well as between the two survey years follows the form prescribed by Engel's law. That is, the proportion of income allocated to food consumption decreases and the proportion allocated to services increases as household income rises. If the factor requirement of food production is more capital intensive than provision of services, the component of labor in total consumption takes on more importance. The result suggests that the capital content of consumption decreases, whereas the labor content of consumption increases, as household income rises. Thus, if the relative importance of household expenditure on services passes a certain threshold, the labor component in the factor content of consumption may dominate, and a reversal of factor content, from capital intensive to labor intensive may take place. The threshold through which the reversal may occur appears to be determined by the size of the spread between the changes in the proportion of food consumption in the household budget relative to household

Table 9: Percentage Distribution of Consumption Expenditure
1964 and 1966

Item	1966					1964				
	Income Class					Income Class				
	I	II	III	IV	V	I	II	III	IV	V
Food	58.23	57.58	55.80	52.71	45.69	62.8	61.5	58.4	55.8	49.7
Beverage	1.3	1.2	1.3	1.2	1.3	0.9	1.0	1.1	1.2	1.2
Tobacco	3.9	3.4	3.1	3.2	3.1	3.3	3.4	3.3	3.4	3.0
Clothing	4.8	5.2	5.5	5.6	6.5	4.8	5.4	5.6	6.3	7.2
Rent & Water	12.1	12.6	13.2	13.7	14.8	11.0	10.7	11.9	12.6	14.4
Fuel	6.6	5.7	5.2	4.9	4.3	5.5	5.0	4.8	4.4	4.1
Furniture	1.0	1.3	1.6	1.8	2.5	0.6	0.6	1.1	1.1	1.6
Household Operations	1.7	1.6	1.6	1.6	2.2	2.0	2.0	1.9	1.9	2.7
Health	5.4	4.9	4.7	4.8	4.5	5.5	5.4	5.5	5.6	4.9
Transportation	1.4	1.5	1.7	1.9	3.5	1.0	1.3	1.6	1.9	2.7
Recreational	1.0	1.1	1.2	1.5	2.2	0.6	0.7	0.9	1.1	1.7
Miscellaneous	2.5	3.8	5.1	6.9	9.2	2.0	3.0	3.9	4.7	6.8

expenditures on services. The magnitude of the spread that is necessary to bring about a reversal in factor intensity may be narrowed if the production of other consumption goods is characterized by capital-intensive techniques. This interpretation is supported by the finding that the direction of factor content of consumption for rural households reverses, from labor intensive to capital intensive, when large-sized firms' capital-intensive techniques are adopted.

To test the sensitivity of factor content with respect to variations in the degree of aggregation of input-output coefficients, it requires simulations involving income changes. Again, for the purpose of maintaining comparability, I follow the same income redistribution scheme that I have used in the previous study. In this report, only the first 4 biased growth redistribution plans are simulated. (See Table 10.)

Table 10: Biased Income Growth Assumed for Simulation (in %)

Income Class	Biased Growth Alternatives			
	1	2	3	4
1	20	30	40	50
2	20	30	40	50
3	20	25	40	45
4	20	25	40	45
5	10	20	30	40
6	10	20	30	40
7	10	15	30	30
8	5	15	20	30
9	5	10	20	25
10	5	10	10	25
11		5		20
12		5		15
13		4		10
14		3		5
15		2		
16		1		

In the original calculation of the factor requirement, the input-output matrix is of an order of 70 x 76. If the 1964 input-output matrix, which has an order of 55 x 55, is mapped into the same $\{\Delta C_j\}$ vector, demand for capital increases by 9% relative to labor. The result is surprisingly consistent with other sensitivity tests with respect to aggregation in that a higher degree of aggregation invariably leads to a higher capital content of consumption. To be sure, the differences between the 1964 and 1966 matrices may involve changes in interindustry interdependency in addition to the difference in the degree of aggregation. Close examination of the coefficients strongly suggests that the differences are basically a matter of aggregation. Moreover, in absolute terms, a higher degree of aggregation of input-output coefficients raises substantially the capital/labor ratios required by the assumed redistribution plans. (See Table 11.)

Table 11: Redistribution Impact on Factor Ratio

Redistribution Policy	Original Simulation Capital/labor Ratio*	New Simulation Capital/labor Ratio*
1	44.4	48.1
2	44.7	48.3
3	44.2	47.2
4	44.5	48.1

*In thousands of NT\$ per worker.

5. Concluding Remarks

In conclusion, major findings reported here reaffirm that the factor content of consumption by the poor is more capital intensive than that by the rich. The factor content of consumption appears to be as much a function of development as it influences the course of development through its impact on factor demand, and thus on income distribution. The evidence generated from the series of simulations cast a serious doubt that the inconsistency in empirical results so far reported is caused by differences in data aggregation. As the case of Taiwan suggests, the factor intensity of consumption is determined by the relative shift in food consumption and demand for services. It follows that variations in empirical results reflect the differences in the stage of development of the countries.

The implications of the findings reported with respect to development theory and policy are rather clear. First, the high capital intensity of consumption by the poor may in part explain why income inequality typically intensifies in the initial stage of development of the Third World countries. Second, a more acceptable and equitable pattern of income distribution is attainable only through development of labor-intensive techniques and programs. That the process of growth itself may resolve the issue of inequity appears to be a very remote possibility.

Appendix

Table 1: Factor Intensity of Consumption by Technology, by Location and by Income Size -With Agricultural Products Disaggregated, 1966*

Income Size	Mixed Technology			Large Firm Technology			Small Firm Technology		
	All Sectors	Urban	Rural	All Sectors	Urban	Rural	All Sectors	Urban	Rural
1	40.1	39.2	42.5	44.6	43.5	47.7	37.6	36.9	39.6
2	38.0	38.7	35.6	42.7	43.5	40.0	35.3	36.5	31.1
3	40.4	41.6	37.2	46.2	47.7	42.4	36.5	38.1	32.1
4	38.9	39.6	38.0	47.1	45.1	42.8	35.1	36.0	33.6
5	39.1	39.6	38.0	44.6	45.3	42.9	34.8	35.5	32.9
6	38.3	38.9	37.0	43.4	44.1	42.0	34.7	35.7	32.5
7	37.3	38.2	35.2	42.3	43.4	39.8	33.6	34.7	31.6
8	37.8	38.2	36.7	42.8	43.3	41.6	34.1	34.9	32.0
9	38.0	38.5	37.0	43.4	43.8	42.4	34.0	35.5	30.7
10	36.6	36.5	36.9	41.4	41.3	42.1	34.3	34.9	32.5
11	37.6	37.7	37.5	42.8	42.7	43.0	34.2	35.1	31.6
12	36.0	36.2	34.9	41.1	41.4	40.2	33.4	34.4	30.3
13	37.2	37.3	37.2	42.6	42.4	42.9	33.3	34.4	30.8
14	36.3	36.3	36.4	41.7	41.5	42.3	32.9	33.7	29.9
15	37.2	37.4	36.6	42.6	42.8	41.7	34.1	34.9	31.8
16	36.6	36.3	37.5	42.0	41.4	43.4	33.0	33.9	31.0
17	36.0	36.5	34.6	41.6	42.1	39.8	33.1	33.7	31.0
18	36.9	37.6	35.3	42.4	43.1	40.8	34.0	35.3	31.1
19	37.2	37.4	36.8	42.8	42.9	42.6	33.5	34.7	30.8
20	37.3	37.0	38.1	43.2	42.8	44.5	33.8	34.7	31.1
21	35.5	35.6	35.2	40.9	41.0	40.8	32.9	34.1	30.2
22	36.1	36.6	34.3	41.9	42.3	40.2	33.5	34.7	28.6
23	36.0	36.0	36.2	42.4	42.4	42.4	32.7	33.4	30.2
24	35.7	35.4	36.8	41.8	41.6	42.5	32.4	32.9	30.6
25	37.4	36.8	38.8	44.3	43.4	46.2	30.9	31.6	29.8
26	36.6	36.1	38.9	43.0	42.2	47.4	33.2	33.7	30.6
27	35.0	35.4	34.2	41.1	41.5	40.4	31.8	33.0	29.6
28	33.5	33.4	34.6	39.6	39.4	40.6	31.9	32.5	28.3
29	36.9	36.5	37.8	43.5	43.1	44.5	33.8	35.2	29.1
30	39.0	38.0	44.6	45.1	44.1	51.5	35.1	35.2	34.3
31	35.8	35.8	-	41.7	41.7	-	32.0	32.1	-
Average	36.8	36.9	36.5	42.7	42.5	42.3	33.5	34.4	30.9

*Measured in terms of capital/labor ratios.

Appendix

Table 2: Factory Intensity of Consumption by
Technology, by Location and by Income Size
-With Agricultural Products Aggregated, 1966*

Income Size	Mixed Technology			Large Firm Technology			Small Firm Technology		
	All Sectors	Urban	Rural	All Sectors	Urban	Rural	All Sectors	Urban	Rural
1	39.7	39.5	40.3	44.2	43.8	45.3	37.2	37.0	37.6
2	38.8	39.6	36.1	43.5	44.4	40.4	36.0	37.3	31.8
3	41.2	42.4	38.2	47.1	48.5	43.3	37.2	38.8	33.1
4	39.8	40.9	38.2	45.0	46.4	42.9	35.9	37.2	34.0
5	40.3	40.8	39.0	45.8	46.7	43.8	35.8	36.7	33.9
6	39.4	40.3	37.7	44.6	45.6	42.6	35.7	37.0	33.2
7	38.5	39.6	36.0	43.5	44.9	40.6	34.9	36.0	32.5
8	39.3	39.9	37.7	44.4	45.2	42.5	35.4	36.4	33.0
9	39.5	40.1	38.1	44.9	45.6	43.5	35.4	37.0	31.9
10	38.0	38.1	37.6	42.9	43.0	42.8	35.6	36.4	33.3
11	39.3	39.6	38.6	44.6	44.8	44.1	35.7	36.8	32.7
12	37.7	38.3	36.2	42.9	43.4	41.4	35.0	36.2	31.5
13	38.9	38.9	38.8	44.3	44.2	44.5	34.8	35.9	32.3
14	37.9	38.0	37.8	43.4	43.3	43.6	34.4	35.2	31.3
15	38.9	39.4	37.7	44.3	44.9	42.7	35.7	36.7	32.9
16	38.2	38.2	38.1	43.6	43.5	43.9	34.4	35.7	31.6
17	37.6	38.2	35.9	43.3	44.0	41.1	34.6	35.3	32.3
18	38.5	39.2	36.7	44.0	44.9	42.2	35.5	36.8	32.5
19	38.8	39.0	38.1	44.5	44.7	43.9	35.0	36.3	32.0
20	38.8	38.8	39.1	44.9	44.7	45.6	35.2	36.3	32.1
21	36.9	37.2	36.5	42.4	42.6	42.1	34.2	35.6	31.5
22	37.6	38.2	35.4	43.5	44.1	41.2	34.9	36.2	29.6
23	37.4	37.4	37.8	44.0	43.9	44.1	34.0	34.6	31.7
24	37.4	37.0	38.4	43.5	43.3	44.2	33.9	34.4	32.2
25	39.3	38.4	41.2	46.4	45.3	48.6	32.6	33.0	31.6
26	38.2	37.6	41.1	44.8	43.8	49.6	34.7	35.1	32.6
27	36.8	37.2	35.9	43.0	43.4	42.2	33.5	34.6	31.2
28	34.5	34.5	34.8	40.7	40.6	40.8	32.8	33.6	28.6
29	38.4	38.0	39.7	45.2	44.7	46.5	35.3	36.0	31.9
30	40.8	40.0	45.2	47.2	46.3	52.0	36.8	37.1	34.9
31	37.3	37.3	-	43.3	43.3	-	33.4	33.4	-
Average	38.4	38.6	37.8	44.0	44.2	43.5	34.9	35.9	32.1

*Measured in terms of capital/labor ratios.

Appendix

Table 3: Impact of Technological and Distributional Changes on Factor Intensity

Income Size	Experiment				
	I	II	III	IV	V
1	40.1	41.3	40.1	46.3	41.7
2	38.0	41.4	38.0	46.9	37.6
3	40.4	41.7	40.4	48.0	38.5
4	38.9	40.4	38.9	44.9	37.2
5	39.1	39.7	39.1	44.5	36.5
6	38.3	40.2	38.3	45.0	35.7
7	37.3	39.7	37.4	45.4	34.3
8	37.8	41.1	37.8	48.1	34.7
9	38.0	39.6	38.0	46.2	34.6
10	36.6	39.7	36.6	46.0	33.9
11	37.6	40.5	37.6	48.8	34.3
12	36.0	39.7	36.0	48.2	32.0
13	37.2	39.8	37.2	48.0	33.4
14	36.3	39.8	36.3	49.7	32.5
15	37.2	40.5	37.2	49.9	32.8
16	36.6	39.9	36.6	48.4	33.0
17	36.0	40.0	36.0	50.2	32.0
18	36.9	38.3	36.9	46.6	32.6
19	37.2	40.2	37.2	49.5	33.4
20	37.3	39.1	37.3	50.5	32.4
21	35.5	37.7	35.5	48.2	31.4
22	36.1	38.3	36.1	51.0	31.5
23	36.0	37.2	36.0	50.6	31.2
24	35.7	36.9	35.7	49.1	31.4
25	37.4	37.2	37.4	49.1	32.6
26	36.6	40.9	36.6	52.9	30.7
27	35.0	39.1	35.0	50.0	30.1
28	33.5	38.6	33.5	56.6	31.2
29	36.9	37.6	36.9	50.0	31.8
30	39.0	37.6	39.0	53.2	32.4
31	35.8	44.4	35.8	66.7	34.3
Mean	36.8	39.5	36.8	48.6	33.0

Appendix

Table 4: Percentage Distribution of Income By Size (Deciles)
1964 and 1966

Income Decile	1966			1964		
	(1) % of Income Received	(2) Average Income	(3) Cumulative Percentage	(1) % of Income Received	(2) Average Income	(3) Cumulative Percentage
1	3.18	10,693	3.18	3.02	9,040	3.02
2	4.72	15,833	7.90	4.69	14,011	7.71
3	5.77	19,350	13.67	5.78	17,291	13.49
4	6.68	22,503	20.35	6.79	20,326	20.23
5	7.57	25,398	27.92	7.79	23,284	23.07
6	8.62	28,924	36.54	8.83	26,408	36.90
7	9.98	33,462	46.52	10.10	30,198	47.00
8	12.03	40,356	58.55	11.98	35,687	58.93
9	15.40	51,569	73.95	15.00	44,852	73.93
10	26.05	87,357	100.00	26.07	77,980	100.00

PROGRAM OF DEVELOPMENT STUDIES
Discussion Paper Series

73. "Savings Behavior of Poor and Rich in Taiwan: 1964, 1966, 1968, and 1970" (1976), 30 pp..... Marian Krzyzaniak
74. "Communalism and the Gains from Development: The Case of Nigeria" (1976), 50 pp..... Gaston V. Rimlinger
75. "The Relevance of the New View of the Incidence of the Property Tax in Developing Countries" (1976), 38 pp..... Charles E. McLure, Jr.
76. "Price Policy and Agricultural Development in Ecuador" (1976), 34 pp..... Wayne R. Thirsk
77. "The Incidence of Jamaican Taxes, 1971-72" (1976), 37 pp..... Charles E. McLure, Jr.
78. "The Production Structure of the Manufacturing Sector and Its Distribution Implications: The Case of Taiwan" (1976), 33 pp.... Yhi-Min Ho
79. "Income Distribution and the Composition of Final Demand: Some New Findings for Colombia" (1977), 41 pp..... Wayne R. Thirsk
80. "Commodity Instability and Market Failure: A Survey of Issues" (1977), 45 pp..... Gordon W. Smith
81. "An Analysis of the Savings Behavior of a Group of Colombian Artisan Entrepreneurs" (1977), 41 pp..... Donald L. Huddle
82. "U.S. Commodity Policy and the Tin Agreement" (1977), 31 pp..... Gordon W. Smith
83. "Data Reliability in Cross-National Research: A Test Employing Black Africa Country Experts" (1978), 28 pp.,K.Q. Hill & F.R. von der Mehden
84. "Urban Building and Income Distribution in Colombia: Some Relevant Aspects" (1978), 40 pp..... R. Albert Berry & Ronald Soligo
85. "Structural Change, Employment and Income Distribution: The Case of Korea 1960-1970" (1978)..... Daemo Kim
86. "Area Experts' Images of African Nations: A Test of a Reputational Measurement Approach" (1978), 29 pp....F.R. von der Mehden & K.O. Hill
87. "Imperfect Capital Markets and Life-Cycle Consumption: A Model and Empirical Test for Urban Colombia" (1978), 55 pp.....John K. Hill
88. "Islam, Development and Politics in Malaysia" (1978), 24 pp..... F. R. von der Mehden
89. "Communalism, Bureaucracy and Access to Public Services in Afro-Asia: An Overview" (1978), 29 pp..... F. R. von der Mehden
90. "Factor Content of Consumption by Income Size: Some Further Evidence" (1978), 31 pp..... Yhi-Min Ho

NOTE: Discussion Papers are available in limited quantities upon request to individual scholars and researchers and libraries of educational institutions.