THE STRUCTURE OF HOUSEHOLD SPENDING IN SOUTH AMERICAN CITIES: INDEXES OF DISSIMILARITY AND CAUSES OF INTER-CITY DIFFERENCES

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Household budget data collected in 1966-1971 in eleven cities in six South American countries are used to define individual mean budget structures (means of budget shares across households). These structures are then compared by indexes of dissimilarity, calculated for the entire budget and also for major components: food, animal protein foods, nonfood, and housing and clothing. Differences among cities in real income account for much of the difference in the share of the consumer budget devoted to food, which in turn is a principal source of overall budget dissimilarity. Within the food and nonfood budgets separately, income is of somewhat less importance; prices and preferences become more significant. Budget structures tend for this reason to be similar for cities in the same country. The structure of nonfood spending also varies markedly between coastal and interior cities, largely because of differences in housing costs. The available price data account for dissimilarities which depend on the price of a single large category of spending, but they do not help explain structural differences involving many categories: prices seem more important for nonfood than for food expenditures. Regression analysis is used to weigh the importance of each variable contributing to dissimilarity.

The theory of consumer behavior relates the allocation of expenditure to a household's income, its utility function and the prices it faces. This relation can be extended to comparisons between groups of consumers—for example, between the populations of different cities—provided (1) all consumers in a city face the same prices, (2) the distribution of income has the same shape in different cities, and (3) the tastes or needs of all the families in a city are related to observable factors which differ in value from one city to another.

In this paper we present such comparisons for eleven cities in six countries of South America: Colombia (Bogotá, Barranquilla, Cali, Medellín), Chile (Santiago), Ecuador (Quito, Guayaquil), Paraguay (Asunción), Peru (Lima) and Venezuela (Caracas and Maracaibo). The household budget data were collected between 1966 and 1971 by member institutes of the ECIEL Program of Joint Studies of Latin American Economic Integration.[1] The results presented here

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[1]ECIEL is the acronym for the Program's Spanish name: Estudios Conjuntos sobre Integración Económica Latinoamericana. The institutes participating in this study in these countries were: Centro de Estudios sobre Desarrollo Económico, Universidad de los Andes (Bogotá, Colombia); Departamento de Economía, Universidad de Chile (Santiago); Instituto Nacional de Estadística (Quito, Ecuador); Centro Paraguayo de Desarrollo Económico y Social (Asunción, Paraguay); Centro de Investigaciones Sociológicas, Económicas, Políticas y Antropológicas, Pontificia Universidad Católica del Perú (Lima); Banco Central de Venezuela (Caracas); and Universidad del Zulia (Maracaibo, Venezuela).

are drawn partly from a comparative study of household incomes and expenditures in five of the six countries (Musgrove, Forthcoming, Chapter Four); analyses of the data for individual countries have been published in Colombia (Prieto, 1971) and Peru (Figueroa, 1974) and are in preparation in Chile (Chaigneau, 1976) and Venezuela (Fernández and de Khan, 1976). In each city, a sample of between 360 and 3,400 observations was taken. All statistics are weighted to correct for sample non-proportionality, so that variations in sample design do not affect the comparability of the data.

I. Individual Mean Budget Shares

Let E_{rhc} be the expenditure on category r by household h in the city c, and let E_{hc} be that household's total expenditure. We define the individual mean budget share of category r in city c as the mean of the expenditure shares of the individual families. That is,

$$E_{rc} = \sum_h W_{hc}(E_{rhc}/E_{hc})$$

where W_{hc} is the weight assigned to household h, and $\sum_h W_{hc} = 1$. In this measure, every family is counted equally, apart from differences in the W_{hc} which are required to correct for sample non-proportionality. E_{rc} differs from the ratio of mean E_{rhc} to mean E_{hc}, in which every family is represented according to its total expenditure, or

$$\tilde{E}_{rc} = \sum_h W_{hc}E_{rhc}/\sum_h W_{hc}E_{hc} = \bar{E}_{rhc}/\bar{E}_{hc}.$$

This "global" mean has the advantage of corresponding to national accounts shares, but it has the disadvantage of not conforming very well to differences in real income among countries.

This difference arises because in these 11 cities there is a negative relation between the average level of real income and the degree of its concentration, measured by the Gini coefficient (Musgrove, Forthcoming, Tables 2-1 and 2-3). We choose to measure the "typical" income of a country or city by the median, and to use E_{rc} rather than $\tilde{E}_{rc}$ as the indication of how a "typical" household allocates its spending.

Table 1 shows the shares E_{rc} for 15 subtotals of expenditure. Of these, nine are not further divided, and the remaining six are divided into 28 components, 13 in food and beverages and 15 in non-food expenditures. In addition to the structures by city, a composite budget allocation is shown for the two Ecuadorean cities; this is because the price indexes, to be discussed later, treat Quito and Guayaquil together.

II. Dissimilarity of Total Budget Structures

We measure the difference between two budget structures by the index of dissimilarity, defined as the sum of the absolute values of the differences between two cities in individual mean shares:

$$\Delta(c, c') = \sum_r |E_{rc} - E_{rc'}|$$

where c and c' are the cities compared and the sum is over all expenditure categories. This index was first used by Kravis (1958); it ranges from zero to a maximum of 200 percent, and there is no test of statistical significance for it. The value of Δ depends on the number of categories distinguished, since disaggregating any category can raise, but cannot lower, the index. For a given number of categories, Δ also depends on their definition.[2] Any grouping is somewhat arbitrary, but the structure presented in Table 1 conforms to the traditional classification of consumer spending. The dependence of Δ on the level of disaggregation is dealt with by computing dissimilarity indexes within large categories, and by showing what share of the total index for a given classification is due only to differences among two or three major subtotals.

Indexes of dissimilarity can be computed between groups in one population, or between the same group in different populations, as Meyer (1973) has done for groups of households defined by quartiles of total income.[3] The index can also be used to *choose* groupings for households, the objective being to obtain the same pattern of Δ among groups defined by one variable (such as education) as among those defined by another (such as income). This approach has been followed in Chile (Chaigneau, 1976, Part IV). Here, however, we consider only dissimilarities between the entire populations of two cities.

Table 2 presents the values of Δ for 55 binary comparisons among cities, and for five comparisons between the composite structure for Ecuador and the capital cities of the other five countries.[4] Expenditures on housing, clothing, recreation and culture, and other consumption are not disaggregated, so the index is based on the 13 food and 16 nonfood categories indicated in Table 1. A cursory examination suggests three factors which may account for much of the difference among cities. The first is real income, since Δ is notably high for comparisons involving Caracas, the richest of the eleven cities, or Asunción, the poorest of them. The second factor is the country: of eight values of Δ below 25, five are for comparisons between two cities in the same country. Moreover, for every one of the eight cities in a country represented by two or more cities, the lowest index occurs for the comparison to another city in the same country. Both prices and tastes can be expected to be similar for cities in the same national economy and culture, so it is not surprising that this factor should be important.

Finally, geography appears to be important even across national boundaries. There is some suggestion that cities on or near the seacoast have similar budget structures, which differ systematically from those of interior cities. For example, comparisons involving Lima tend to give lower values of Δ if the other city is coastal (Barranquilla, Santiago, Guayaquil, Caracas, Maracaibo) than if it lies in the interior (Bogotá, Medellín, Quito, Asunción). Cali is somewhat difficult to classify in this way, since although it is distant from the coast, it lies at

[2]The difficulties of interpreting Δ are well discussed by Barten (1973).

[3]Meyer used the ECIEL data for Bogotá, Asunción, Lima and Caracas. Expenditure categories differ slightly from those in Table 1; for example, food and beverages are not disaggregated. Moreover, the household was redefined to include secondary consuming units and supplementary members. Meyer's results are therefore not fully comparable to those presented here.

[4]Note that Δ is not transitive: $\Delta(c, c'')$ is not a linear combination of $\Delta(c, c')$ and $\Delta(c', c'')$, so the 55 values are independent.

TABLE 1

INDIVIDUAL MEAN EXPENDITURE

Category of Expenditure	COLOMBIA				CHILE
	Bogotá	Barranquilla	Cali	Medellín	Santiago
Food and Beverages	46.60	56.77	56.32	51.72	40.81
Dairy Products and Eggs*	6.14	6.72	6.81	7.57	4.25
Cereals*	8.66	11.36	9.18	8.22	8.35
Meat and Poultry*	9.09	14.20	14.60	12.74	8.12
Seafood*	0.17	1.15	0.23	0.08	1.00
Vegetables and Tubers*	7.59	6.08	8.16	7.45	6.21
Fruits*	2.34	3.04	3.38	1.79	2.28
Fats and Oils*	2.12	2.66	3.13	2.20	2.00
Sugar and Sweets*	1.71	2.20	2.93	3.86	2.21
Hot Beverages*	2.35	1.27	2.40	2.73	1.41
Alcoholic Beverages*	0.46	1.20	0.40	0.31	0.90
Other Beverages*	0.21	0.64	0.21	0.15	0.67
Other Foods*	0.44	0.94	0.58	0.44	0.84
Meals away from Home*	5.33	5.31	4.30	4.20	2.59
Housing Expenditures*	26.01	17.52	18.73	23.75	26.22
Principal Dwelling	25.25	16.59	18.18	23.14	25.51
Other Housing	0.06	0.03	0.03	0.26	N.A.
Maintenance	0.71	0.90	0.52	0.34	0.71
Furnishings and Operation	4.87	4.77	4.94	3.56	6.95
Furniture and Durable Goods*	1.86	1.68	1.77	1.06	3.93
Non-Durable Goods*	1.63	2.01	1.80	1.36	1.42
Services*	1.38	1.07	1.37	1.14	1.60
Clothing*	7.31	5.96	6.11	4.36	11.68
Ready Made Clothing (Men's)	2.24	1.90	2.09	1.11	5.68
Ready Made Clothing (Women's)	2.87	2.35	2.44	1.81	4.38
Ready Made Clothing (Children's)	2.04	1.45	1.39	1.07	0.29
Other Articles of Clothing	0.16	0.25	0.19	0.37	1.33
Medical Care*	1.87	2.36	1.31	1.79	1.30
Education*	4.93	3.57	2.62	3.45	0.73
Total Recreation and Culture*	1.81	1.71	1.86	1.45	3.06
Recreation	1.24	1.07	1.19	0.97	1.81
Reading and Culture	0.57	0.65	0.67	0.48	1.26
Vehicle Operation and Maintenance*	0.46	0.69	0.38	0.38	0.69
Public Transportation*	2.49	2.08	1.95	1.69	3.07
Telephone and Other Communication*	0.36	0.28	0.36	0.10	0.43
Vehicle Purchase: Payments*	0.03	0.00	0.01	0.06	0.43
Other Consumption Expenditures*	2.15	3.44	2.69	2.34	4.40
Tobacco	0.27	0.76	0.52	0.80	1.75
Personal Care	1.78	2.41	2.08	1.41	2.35
Ceremonies	0.09	0.27	0.09	0.13	0.30
Insurance*	0.13	0.05	0.10	0.11	N.A.
Gifts and Private Transfers*	0.82	0.68	0.84	0.93	2.35
Other Non-Consumption Expenditures*	0.15	0.12	0.13	0.23	0.29
Unspecified, or Rounding Error	0.01	0.00	1.65	4.08	0.07
Total Expenditures	100.00	100.00	100.00	100.00	100.00

*Categories included in the calculation of the index of dissimilarity (Δ).

ECUADOR			PARAGUAY	PERU	VENEZUELA	
Quito	Guayaquil	Composite	Asunción	Lima	Caracas	Maracaibo
45.68	53.23	50.00	34.46	43.36	35.55	52.37
5.93	6.48	6.24	5.10	6.01	5.63	10.57
10.29	11.81	11.16	5.84	7.75	4.14	7.43
6.68	10.85	9.07	8.53	11.01	7.70	10.90
0.59	2.13	1.47	0.39	1.45	0.94	1.03
6.02	6.22	6.14	3.19	5.90	3.93	3.69
2.26	2.31	2.29	1.88	2.34	2.18	3.82
2.48	3.08	2.82	1.65	1.39	1.58	2.24
2.66	2.80	2.74	1.84	1.35	1.23	1.80
1.37	1.48	1.43	1.61	0.66	1.16	1.87
0.42	0.50	0.47	1.14	0.36	1.14	1.15
0.47	0.99	0.77	0.57	0.12	1.02	1.13
0.56	0.57	0.57	0.38	1.18	1.07	1.37
5.60	3.90	4.63	2.32	3.81	3.67	5.13
25.96	21.81	23.58	36.32	20.04	27.71	19.16
24.15	20.82	22.25	32.22	18.11	27.68	19.14
1.35	0.51	0.87	0.95	0.48	N.A.	N.A.
0.45	0.48	0.47	3.15	1.45	0.03	0.02
5.57	5.57	5.57	5.15	9.47	5.62	6.88
2.83	2.54	2.66	2.14	5.86	1.22	3.88
1.68	1.58	1.62	2.25	1.89	1.74	1.93
1.06	1.45	1.29	1.13	1.73	2.64	1.07
10.21	6.51	8.10	7.30	7.88	6.36	3.66
4.30	2.90	3.50	2.36	3.48	1.56	1.36
4.75	2.76	3.61	3.57	3.25	2.37	1.11
0.23	0.19	0.21	0.86	0.32	1.52	0.90
0.94	0.67	0.78	0.51	0.82	0.91	0.28
2.94	2.00	2.40	1.75	2.12	3.65	1.20
1.40	1.79	1.62	1.88	1.65	3.27	1.55
1.57	1.73	1.66	1.53	2.61	3.20	2.96
1.08	1.01	1.04	0.72	1.40	2.65	2.50
0.49	0.73	0.62	0.81	1.21	0.55	0.46
0.25	0.31	0.28	1.72	1.91	3.64	1.52
N.A.	N.A.	N.A.	3.68	3.05	3.20	3.91
0.44	0.20	0.31	0.43	0.27	0.72	0.16
N.A.	N.A.	N.A.	0.21	0.56	0.36	0.74
2.99	3.27	3.15	3.64	4.40	3.96	5.04
0.68	0.67	0.67	1.33	0.68	1.50	1.47
2.00	2.53	2.31	2.10	3.36	2.45	3.57
0.30	0.07	0.17	0.21	0.36	0.00	0.00
0.05	0.14	0.10	0.06	1.58	0.22	0.14
1.95	2.99	2.55	1.27	0.45	0.94	0.32
0.58	0.19	0.36	0.21	0.55	0.14	0.12
0.36	0.26	0.30	0.03	0.06	1.46	0.27
100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 2

INDEXES OF DISSIMILARITY OF TOTAL BUDGET (Δ) AND THE SHARE DUE TO FOOD EXPENDITURES ALONE ($\Delta_{f,n}$)

	Bogotá	Barranquilla	Cali	Medellín	Santiago	Quito	Guayaquil	Ecuador (Composite)	Asunción	Lima	Caracas
Barranquilla	30.07										
	(20.34)										
Cali	24.80	16.55									
	(19.44)	(0.90)									
Medellín	20.26	34.29	19.58								
	(10.24)	(10.10)	(9.10)								
Santiago	28.09	42.20	42.34	39.95							
	(11.58)	(31.92)	(31.02)	(21.82)							
Quito	23.72	35.07	37.13	34.92	24.93						
	(1.84)	(22.18)	(21.28)	(12.08)	(9.74)						
Guayaquil	29.36	23.33	25.22	28.26	32.30	23.24					
	(13.26)	(7.08)	(6.18)	(3.02)	(24.84)	(15.10)					
Ecuador	20.91	—	—	—	23.95	—	—				
(Composite)	(6.80)				(18.38)						
Asunción	35.68	50.27	50.58	45.30	34.33	40.10	45.17	40.36			
	(24.28)	(44.62)	(43.72)	(34.52)	(12.70)	(22.44)	(37.54)	(31.08)			
Lima	33.70	32.85	34.00	35.85	29.18	38.16	29.48	27.29	42.70		
	(6.48)	(26.82)	(25.92)	(16.72)	(5.10)	(4.64)	(19.74)	(13.28)	(17.80)		
Caracas	33.10	42.64	46.24	42.82	30.38	38.83	43.74	37.00	29.44	36.50	
	(22.10)	(42.44)	(41.54)	(32.34)	(10.52)	(20.26)	(35.36)	(28.90)	(2.18)	(15.62)	
Maracaibo	41.84	33.16	35.41	37.51	39.84	48.19	39.03	—	46.75	28.33	42.87
	(11.54)	(8.80)	(7.90)	(1.30)	(23.12)	(13.38)	(1.72)		(35.82)	(18.02)	(33.64)

only 3,000 feet and has a more tropical climate than the other interior cities (Medellín is at 5,000 feet and Bogotá and Quito at about 9,000 feet. Ascunción is near sea level, like the coastal cities, but very far inland). As in the case of country, similarity of geographic location is associated not only with similar needs, but also—because of transport costs—with similar patterns of availability and prices. It does not appear that other geographic differences have much effect on Δ, perhaps because all the cities except Asunción and Santiago lie within 12 degrees of the equator. Climate depends more on altitude and on distance from the coast than on latitude.

If much of the difference in budget structure between two cities is due to income differences, it might be expected that $E_{(\text{food})}$ will differ markedly between them. If instead the structures differ because of distinct preferences, or prices, the values of $E_{(\text{food})}$ may be similar and the value of Δ will arise mostly from differences in allocation within the food budget and within the non-food budget. Table 2 also shows (in parentheses) an index based only on the distinction between food and non-food:

$$\begin{aligned}\Delta_{f,n}(c, c') &= |E_{(\text{food})c} - E_{(\text{food})c'}| + |E_{(\text{nonfood})c} - E_{(\text{nonfood})c'}| \\ &= 2|E_{(\text{food})c} - E_{(\text{food})c'}|,\end{aligned}$$

since $E_{(\text{nonfood})c} = 100 - E_{(\text{food})c}$.

III. Dissimilarity of Food and Nonfood Budgets

Since $\Delta_{f,n}/\Delta$ differs greatly among pairs of cities, little can be learned from the shares in Table 1 about the allocation of either major portion of the budget. It is more instructive to analyze the shares of different food categories within the total share spent on food and beverages, and similarly for nonfood categories. We compute the share $E_{rc}/E_{(\text{food})c}$ that each of the 13 food categories is of total food spending. Some shares—dairy products, vegetables and tubers, and fats and oils are examples—are fairly similar in all eleven cities, whereas other categories—meat and poultry, seafood, hot beverages—vary more widely.

From these relative shares we compute an index of food budget dissimilarity

$$\Delta_f(c, c') = \sum_r |E_{rc}/E_{(\text{food})c} - E_{rc'}/E_{(\text{food})c'}|$$

where the sum is over the food categories only. These values are given in Table 3. Generally, $\Delta_f < \Delta$ for the same pair of cities, but this comparison means nothing since the number of categories has been reduced. What is notable is that Δ_f varies somewhat less than Δ, perhaps because income differences have more effect on the food/non-food allocation than on specific food categories. We expect however that Δ_f, like Δ, will be related to differences in income, country and geographic location. The ten lowest values of Δ_f refer to pairs of cities in the same country or the same location or both, while seven of the 17 highest values of the food index involve Caracas (eight involve Maracaibo, and five include Quito).

TABLE 3

INDEXES OF DISSIMILARITY OF FOOD BUDGET (Δ_f) AND THE SHARE DUE TO ANIMAL PROTEIN ALONE (Δ_p)

	Bogotá	Barranquilla	Cali	Medellín	Santiago	Quito	Guayaquil	Ecuador (Composite)	Asunción	Lima	Caracas
Barranquilla	22.89 (11.66)										
Cali	20.21 (10.74)	19.66 (0.92)									
Medellín	21.21 (12.72)	26.22 (1.06)	12.62 (1.98)								
Santiago	21.05 (0.58)	16.42 (12.24)	21.48 (11.32)	29.20 (13.30)							
Quito	19.97 (8.32)	25.29 (19.98)	29.40 (19.06)	32.18 (21.04)	23.24 (7.74)						
Guayaquil	25.20 (7.00)	18.63 (4.66)	23.47 (3.74)	29.61 (5.72)	15.47 (7.58)	18.81 (15.32)					
Ecuador (Composite)	21.44 (1.02)	—	—	—	16.71 (1.60)	—	—				
Asunción	27.40 (15.27)	17.62 (3.61)	17.22 (4.53)	18.45 (2.55)	24.01 (15.85)	37.75 (23.59)	24.84 (8.27)	27.86 (14.25)			
Lima	23.54 (19.18)	15.57 (7.52)	18.59 (8.44)	21.41 (6.46)	26.03 (19.76)	30.99 (27.50)	25.40 (12.18)	25.24 (18.16)	23.65 (3.91)		
Caracas	30.30 (14.18)	24.29 (2.52)	32.01 (3.44)	32.69 (1.46)	30.69 (14.76)	36.89 (22.50)	31.12 (7.18)	30.78 (13.16)	23.85 (1.09)	26.08 (5.00)	
Maracaibo	34.01 (19.82)	28.72 (8.16)	36.38 (9.08)	36.74 (7.10)	34.56 (20.40)	41.22 (28.14)	35.75 (12.82)	—	26.66 (4.55)	32:27 (0.64)	16.69 (5.64)

TABLE 4

INDEXES OF DISSIMILARITY OF NONFOOD BUDGET (Δ_n) AND THE SHARE DUE TO HOUSING AND CLOTHING ALONE (Δ_h)

	Bogotá	Barranquilla	Cali	Medellín	Santiago	Quito	Guayaquil	Ecuador (Composite)	Asunción	Lima	Caracas
Barranquilla	18.90 (16.62)										
Cali	14.94 (8.36)	14.00 (9.82)									
Medellín	15.39 (10.44)	28.35 (27.06)	23.87 (18.80)								
Santiago	30.96 (12.16)	29.20 (19.78)	20.86 (10.46)	40.95 (19.80)							
Quito	22.41 (8.92)	26.54 (20.10)	19.70 (10.28)	29.91 (16.56)	19.48 (3.56)						
Guayaquil	20.97 (8.76)	21.41 (8.56)	13.73 (2.40)	27.34 (18.50)	23.16 (12.86)	15.49 (12.38)					
Ecuador (Composite)	20.54 (6.98)	—	—	—	24.98 (8.44)	—	—				
Asunción	23.84 (13.66)	34.78 (30.28)	27.80 (22.02)	16.73 (5.76)	35.60 (22.52)	27.24 (18.96)	28.41 (21.72)	27.18 (20.64)			
Lima	37.70 (23.62)	24.54 (7.00)	26.62 (15.26)	46.43 (34.06)	26.42 (25.22)	34.14 (25.54)	31.71 (15.56)	32.66 (18.66)	39.86 (37.28)		
Caracas	28.04 (16.72)	24.12 (7.36)	20.75 (10.06)	27.51 (19.94)	31.62 (20.02)	30.44 (20.34)	25.09 (7.96)	27.00 (13.46)	30.76 (25.28)	32.40 (14.12)	
Maracaibo	43.80 (27.10)	31.34 (11.90)	33.56 (20.44)	45.41 (29.90)	31.98 (30.40)	42.58 (10.72)	34.53 (18.34)	—	39.02 (35.66)	24.04 (13.46)	38.41 (10.38)

Different food categories have quite different elasticities with respect to total expenditure. As income rises, consumption shifts away from cereals and tubers and toward fruits and animal protein—meat, poultry, seafood, dairy products and eggs.[5] We therefore show in Table 3 (in parentheses) an index of the dissimilarity in shares of animal protein sources,

$$\Delta_p(c, c') = 2|E_{pc}/E_{(\text{food})c} - E_{pc'}/E_{(\text{food})c'}|$$

where E_{pc} is the sum of the shares for dairy products and eggs, meat, poultry and seafood. At this level of disaggregation, dissimilarity between cities is likely to depend not simply on difference between price structures, but on differences in the price of food in particular or of a major component such as meat and poultry.

In Table 4 we repeat this analysis for 13 categories of non-food expenditure. (The categories of vehicle purchases, insurance and assorted non-consumption are excluded because they are not comparable among cities). The most striking differences among cities in the shares $E_{rc}/E_{(\text{nonfood})c}$ are the low expenditure on housing and high share for durables in Lima; the large educational share in all the Colombian cities; the large transfers in Ecuador; and the substantial expenses for private vehicles in Peru and Venezuela. Nonfood budget shares vary more than food budget shares, among cities, in consequence of differences in sample size or survey technique. Thus the use of only a one-month survey contributes to the very low durables share in Caracas, for example; in Maracaibo, the survey covered an entire year.

The index of dissimilarity of the nonfood budget is shown in Table 4,

$$\Delta_n(c, c') = \sum_r |E_{rc}/E_{(\text{nonfood})c} - E_{rc'}/E_{(\text{nonfood})c'}|$$

where the sum is over nonfood categories only.[6] It might be expected that expenditure elasticities would vary more among nonfood categories than among kinds of foods, so that Δ_n would increase more than Δ_f as incomes are more different. Since Δ_n is not more dispersed than Δ_f, any such effect must be outweighed by the fact that categories with very high or very low elasticities receive only small shares of the budget. The two largest categories are always housing and clothing, which have elasticities close to 1.0 in all countries (Musgrove, Forthcoming, Table 6-1).

Because housing and clothing together absorb between 49 and 67 percent of the nonfood budget, we also show in Table 4 (in parentheses) an index based only on those two categories,

$$\begin{aligned}\Delta_h(c, c') = &|E_{(\text{housing})c}/E_{(\text{nonfood})c} - E_{(\text{housing})c'}/E_{(\text{nonfood})c'}| \\ &+ |E_{(\text{clothing})c}/E_{(\text{nonfood})c} - E_{(\text{clothing})c'}/E_{(\text{nonfood})c'}| \\ &+ |E_{(\text{other})c}/E_{(\text{nonfood})c} - E_{(\text{other})c'}/E_{(\text{nonfood})c'}|\end{aligned}$$

[5]Expenditure elasticities are reported for each of these countries except Paraguay, in Musgrove (Forthcoming, Chapter Six, Part I.2). For a discussion of the change in the composition of food consumption as income increases, see Chapter Five.

[6]It should be noted that unless $E_{(\text{food})c} = E_{(\text{food})c'}$, so that $\Delta_{f,n}$ vanishes, the overall index of dissimilarity Δ cannot be expressed as a linear combination of $\Delta_{f,n}$, Δ_f and Δ_n. If $\Delta_{f,n} = 0$, then of course

$$\Delta = E_{(\text{food})}\Delta_f + E_{(\text{nonfood})}\Delta_n.$$

where $E_{(\text{other})} = 100 - E_{(\text{housing})} - E_{(\text{clothing})}$. There is not much pattern to the relation between Δ_h and Δ_n, except that housing and clothing account for much of the nonfood budget dissimilarity in several comparisons within one country. Low values for Δ_h occur in the group Bogotá–Cali–Santiago–Quito, and high values characterize most comparisons involving Asunción, Lima, Caracas or Maracaibo, cities with unusually high or low shares of expenditure on housing[7]. This category appears to be the most strongly related to location, shares being systematically higher in the interior than on the coast.

The six dissimilarity indexes are, in general, not very highly correlated with one another (the correlation is limited to the 55 indexes between pairs of cities, excluding comparisons involving the composite Ecuadorean structure):

Correlation:	Δ	$\Delta_{f,n}$	Δ_f	Δ_p	Δ_n
$\Delta_{f,n}$	0.690				
Δ_f	0.304	−0.194			
Δ_p	0.129	−0.177	0.477		
Δ_n	0.499	−0.056	0.383	0.220	
Δ_h	0.363	−0.028	0.210	0.122	0.668

Not surprisingly, the highest correlations are between the overall index and the food/nonfood index, and between the nonfood index Δ_n and its major component, the index Δ_h based on housing and clothing alone. The overall index Δ is more strongly associated with Δ_n than with Δ_f, and the latter (food) index is correlated with the index of differences in animal protein consumption Δ_p which is one of its major components. Correlations between independent indexes ($\Delta_{f,n}$ and any other except Δ; Δ_n and Δ_p; Δ_f and Δ_h; or Δ_p and Δ_h) are quite low.

IV. Explaining Dissimilarities: Income and Geographic Differences

For the set of 55 values of each dissimilarity index corresponding to comparisons among all eleven cities, we have identified three likely causative factors. Two can be represented by dummy variables. $D_{(c,c')}$ is zero if cities c and c' are in the same country, which occurs for eight comparisons, and 1.0 if the cities are in different countries. The variable $G(c, c')$ is zero when the two cities belong to the same geographic group, both coastal (15 cases) or both interior (10 cases); it is 1.0 when one city lies on the coast and the other in the interior (30 cases).

The third factor is differences in real income, which we represent by the absolute value of the difference of the logarithms of median incomes in the two cities,

$$Y(c, c') = |\log Y_{mc} - \log Y_{mc'}| = |\log (Y_{mc}/Y_{mc'})|$$

where incomes are converted for comparison from national currency to Venezuelan bolivars of equivalent purchasing power. Table 5 shows the values of the variable Y, and the median household incomes on which it is based. The

[7]The very low share in Lima is attributed by Meyer (1973) to the almost complete absence of rain, which allows dwellings to be built without substantial roofs.

TABLE 5

MEDIAN REAL INCOME PER TRIMESTER, IN NATIONAL CURRENCY AND IN VENEZUELAN BOLIVARS AND INDEX OF INCOME DIFFERENCES

I. Median Real Household Income per Trimester (Y_m)

Bogotá	Barranquilla	Cali	Medellín	Santiago	Quito	Guayaquil	Ecuador (Composite)	Asunción	Lima	Caracas	Maracaibo
National Currency											
6106	4498	4495	4618	4409	5685	6359	6108	26180	21357	4676	2570
Purchasing-Power-Parity Exchange Rate											
(——————0.4800——————)				0.5961	(————	0.4019	————)	0.0525	0.1593	(————1.000————)	
Venezuelan Bolivars of Equivalent Purchasing Power											
2931	2159	2158	2217	2628	2285	2556	2455	1373	3402	4676	2570

II. Index of Income Differences: Absolute Value of Difference of the Logarithms (Y)

	Bogotá	Barranquilla	Cali	Medellín	Santiago	Quito	Guayaquil	Ecuador (Composite)	Asunción	Lima	Caracas	Maracaibo
Barranquilla	0.306											
Cali	0.306	0.000										
Medellín	0.279	0.027	0.027									
Santiago	0.109	0.197	0.197	0.170								
Quito	0.249	0.057	0.057	0.030	0.140							
Guayaquil	0.137	0.169	0.169	0.142	0.028	0.112						
Ecuador (Composite)	0.105	—	—	—	0.167	—	—					
Asunción	0.758	0.453	0.452	0.479	0.649	0.509	0.621	0.581				
Lima	0.149	0.455	0.455	0.428	0.258	0.398	0.286	0.326	0.907			
Caracas	0.467	0.773	0.773	0.746	0.576	0.716	0.604	0.644	1.225	0.318		
Maracaibo	0.131	0.174	0.174	0.148	0.022	0.118	0.005	—	0.627	0.280	0.599	

price data used to express all incomes in bolivars refer to May, 1968, which is within the sample period for the budget data except in Santiago, Ascunción and Caracas. Adjustments were made to the midpoint of the survey period to correct for different rates of national inflation. Real income is notably low in Ascunción and high in Caracas: in eight of the other nine cities, the median lies between 2,150 and 2,950 bolivars per trimester, equivalent to about 1,933 to 2,652 dollars per household per year.[8] The price data and the parity exchange rates come from the ECIEL study of prices and purchasing power, presented by Salazar-Carrillo (1973, 1977) and also analyzed by Vega (1975); the temporal adjustment in the exchange rate follows the procedure used by Meyer (1973).

The variables D, G and Y are used to explain each dissimilarity index, by estimating relations of the form

$$\Delta = \beta_0 + \beta_1 D + \beta_2 G + \beta_3 Y,$$

where Δ stands for any of the six indexes. The three explanatory variables are only slightly correlated, so their effects can be readily distinguished:

	Correlation:	
	D	G
G	0.038	
Y	0.201	0.079

Table 6 presents the results of this analysis. Almost none of the variation in Δ_p can be explained, but for each of the other five indexes, at least one variable has a significant effect. Income differences are the predominant source of dissimilarity in the food share of the budget ($\Delta_{f,n}$) and therefore of overall

TABLE 6

INDEXES OF DISSIMILARITY AS FUNCTIONS OF DIFFERENCES IN COUNTRY, GEOGRAPHIC LOCATION AND MEDIAN HOUSEHOLD INCOME

Index	Mean (and Standard Error of Mean)	Regression Coefficients (Standard Errors in parentheses)				R^2 (and Adjusted R^2)
		Constant	D(Country)	G(Location)	Y(Income)	
Δ	35.08	24.25	8.71*	0.80	8.71*	0.283
	(1.08)	(2.76)	(2.76)	(1.92)	(3.61)	(0.241)
$\Delta_{f,n}$	18.61	12.77	1.67	−3.67	18.94*	0.204
	(1.62)	(4.35)	(4.35)	(3.03)	(5.69)	(0.157)
Δ_f	25.74	19.14	7.13*	2.04	−1.79	0.164
	(0.90)	(2.46)	(2.46)	(1.71)	(3.22)	(0.114)
Δ_p	10.25	8.93	4.22	−0.17	−6.44	0.081
	(0.98)	(2.81)	(2.81)	(1.96)	(3.68)	(0.027)
Δ_n	28.27	19.06	7.95*	3.77	1.08	0.186
	(1.10)	(2.97)	(2.97)	(2.06)	(3.89)	(0.138)
Δ_h	16.90	10.46	2.13	5.69*	4.49	0.154
	(1.14)	(3.17)	(3.17)	(2.20	(4.14)	(0.105)

*Significant at the 95 percent confidence level.

[8]The purchasing power comparison was not extended to the United States, so these dollar estimates are based on the official exchange rate of 4.45 bolivars per dollar.

dissimilarity (Δ). Inter-country differences are most important in explaining dissimilarity within the food and the nonfood budgets, while differences in location—independently of whether two cities are in the same country—matter only for the share devoted to housing.

With four exceptions (none of which is statistically significant), all the coefficients have the expected positive sign. The constant terms are all rather large (at least 60 percent of the mean of the corresponding dissimilarity index), indicating that budget structures can be quite different even for two cities in the same region of the same country, with comparable income levels.

These results suggest that income is an important determinant of budget structure at a very aggregated level, but that at a more detailed level, structure and therefore dissimilarity depend more on tastes and on prices. These factors can be presumed to be more similar within a country than between countries. Individual prices may be important for explaining the indexes based on just a few categories (Δ_p and Δ_h), while for the indexes Δ_f or Δ_n differences in the structure of a set of prices should be important.

Asunción, Paraguay, is the only one of the eleven cities which is not in an Andean country, and it is also the only interior city near sea level. It might be expected, therefore, that tastes and prices are more different in Asunción than can be accounted for by the variables D and G, and that the geographic variable may be mis-specified. (If distance from the sea matters, Asunción is properly regarded as an interior city, but it is mis-classified if the important distinction is between sea level and mountains). To test this possibility, the six regressions of Δ on D, G and Y were repeated for the 45 inter-city comparisons excluding Asunción; the results appear in Table 7.

TABLE 7

INDEXES OF DISSIMILARITY AS FUNCTIONS OF DIFFERENCES IN COUNTRY, LOCATION AND INCOME, ANDEAN CITIES ONLY (EXCLUDING ASUNCIÓN)

Index	Mean (and Standard Error of Mean)	Constant	Regression Coefficients (and Standard Errors)			R^2 (and Adjusted R^2)
			D	G	Y	
Δ	33.54	23.13	7.73*	1.54	11.46*	0.314
	(1.11)	(2.67)	(2.55)	(1.94)	(4.45)	(0.264)
$\Delta_{f,n}$	16.62	9.87	0.11	−2.35	29.79*	0.383
	(1.61)	(3.64)	(3.48)	(2.65)	(6.08)	(0.338)
Δ_f	26.09	18.03	7.45*	2.93	1.41	0.235
	(1.01)	(2.55)	(2.44)	(1.86)	(4.26)	(0.179)
Δ_p	10.68	8.29	4.22	0.68	−5.44	0.072
	(1.07)	(2.99)	(2.86)	(2.18)	(4.99)	(0.004)
Δ_n	27.79	20.17	8.01*	2.26	−0.65	0.156
	(1.24)	(3.29)	(3.15)	(2.39)	(5.49)	(0.094)
Δ_h	15.48	13.13	1.64	3.83	−3.92	0.082
	(1.14)	(3.16)	(3.02)	(2.20)	(5.27)	(0.015)

*Significant at the 95 percent confidence level.

Correlation:

	D	G
G	0.031	
Y	0.125	−0.022

The effect of removing Asunción is to improve slightly the explanations of food budget dissimilarity and of the total food share, and therefore to explain overall dissimilarity somewhat better. The significance of the explanatory variables in these three equations is unchanged. For animal-protein foods, the R^2 statistic drops slightly, but the coefficients of G and Y (neither of which is significant) improve. In the nonfood budget, however, omitting Asunción leads to poorer results; the coefficient of G in the equation for Δ_h loses significance and the income effect becomes negative. Asunción has the highest housing share in the nonfood budget of all eleven cities, so its inclusion improves the explanatory power of income and geography.

V. Explaining Dissimilarities: Income and Price Differences

The conjectures about the relation between budget allocation and price structure cannot, unfortunately, be examined for all eleven cities, because price

TABLE 8

Indexes of Prices Relative to Purchasing Power Parity Index of Total Private Consumption (π_{rc})
(Caracas, Venezuela = 1.000)

	Colombia (Bogotá)	Chile (Santiago)	Ecuador (Composite)	Paraguay (Asunción)	Peru (Lima)
Expenditure Category					
Total Food (Excluding Beverages)	1.208	0.921	1.088	0.924	1.037
Dairy Products and Eggs	1.153	0.880	1.541	1.245	1.046
Cereals	1.462	0.871	0.879	0.876	1.055
Meat and Poultry	1.054	1.038	1.204	0.674	1.141
Fish and Shellfish	2.080	0.803	1.156	1.132	1.349
Vegetables and Tubers	0.509	1.181	0.976	1.224	0.831
Fruits	1.174	0.966	0.747	0.941	0.975
Sugar and Marmalade*	1.056	1.223	1.237	1.303	0.822
Fats and Oils	1.321	1.471	1.391	0.710	0.801
Hot Beverages	0.641	1.318	0.941	1.069	0.992
Meals Away from Home	1.716	1.092	0.668	0.682	0.912
Alcoholic Beverages	1.643	0.795	1.141	0.753	1.018
Other Beverages	0.221	0.665	1.015	0.900	0.742
Housing	0.817	0.954	0.933	0.710	0.558
Repairs	0.477	0.606	0.373	0.530	0.784
Durable Goods	1.383	1.599	1.131	1.695	1.578
Services (Excluding Servants)	0.478	1.040	0.633	2.348	1.107
Men's and Boys' Clothing	0.954	1.166	0.987	0.932	1.333
Women's and Girls' Clothing	1.687	1.448	1.347	1.189	1.316
Medical Care (Services Only)†	0.898	0.614	0.446	0.789	0.949
Recreation and Culture (Services Only)	0.895	0.912	0.808	0.918	0.792
Public Transport	1.156	1.110	1.124	1.498	1.394
Communication	0.549	1.498	0.589	1.325	1.222
Tobacco	0.623	1.159	0.821	1.011	1.135
Personal Care (Services Only)	0.533	0.925	0.567	0.730	0.905

*Other sweets form a separate category.

†Goods related to medical care, schooling, recreation and culture, and personal care are included in the category of non-durable goods.

data are available only for the capital cities, or—in the case of Ecuador—for a composite of two cities. The following analysis is therefore based on 15 comparisons among six countries.

Table 8 shows the price relatives π_r for five countries (Caracas, Venezuela being the basis of comparison), for 12 food categories and for total food, and for 12 nonfood expenditure groups. The classification generally matches that adopted for the budget data, except that beverages are not included with total food, and in several categories goods are priced separately from services. Comparability is better for food than for nonfood.

For prices of individual categories, we adopt an index of the same form as that used to describe income differences: that is, the absolute value of the difference in the logarithms,

$$\Pi_r(c, c') = |\log \pi_{rc} - \log \pi_{rc'}| = |\log (\pi_{rc}/\pi_{rc'})|.$$

Values of Π_r are shown in the first part of Table 9 for the three categories of greatest interest—all food, meat and poultry, and housing. The very low price of

TABLE 9

INDEXES OF DISSIMILARITY OF PRICES AND OF PRICE STRUCTURES

		Bogotá	Santiago	Ecuador	Asunción	Lima
		I. Indexes of Price Differences (Π_r)				
Santiago:	food	0.271				
	meat	0.015				
	housing	0.155				
Ecuador:	food	0.105	0.167			
	meat	0.133	0.148			
	housing	0.133	0.022			
Asunción:	food	0.268	0.003	0.163		
	meat	0.447	0.432	0.580		
	housing	0.140	0.295	0.273		
Lima:	food	0.153	0.119	0.048	0.115	
	meat	0.079	0.095	0.054	0.526	
	housing	0.381	0.536	0.514	0.241	
Caracas:	food	0.189	0.082	0.084	0.079	0.036
	meat	0.053	0.037	0.186	0.395	0.132
	housing	0.202	0.047	0.069	0.342	0.583
		II. Indexes of Dissimilarity of Price Structures				
Santiago:	Π^{Δ}	0.255				
	Π^{Δ_f}	0.357				
	Π^{Δ_n}	0.177				
Ecuador:	Π^{Δ}	0.245	0.143			
	Π^{Δ_f}	0.339	0.170			
	Π^{Δ_n}	0.158	0.120			
Asunción:	Π^{Δ}	0.346	0.250	0.268		
	Π^{Δ_f}	0.516	0.240	0.237		
	Π^{Δ_n}	0.208	0.256	0.295		
Lima:	Π^{Δ}	0.257	0.252	0.278	0.265	
	Π^{Δ_f}	0.233	0.198	0.186	0.303	
	Π^{Δ_n}	0.277	0.292	0.359	0.235	
Caracas:	Π^{Δ}	0.236	0.117	0.170	0.300	0.232
	Π^{Δ_f}	0.278	0.128	0.173	0.251	0.099
	Π^{Δ_n}	0.206	0.110	0.167	0.332	0.319

housing in Lima leads to relatively large values of Π_{housing}; similarly, Π_{meat} is high for comparisons involving Asunción, where meat is especially cheap.

In the second part of Table 9, we present indexes of dissimilarity of price *structures*, for all categories together and then for food prices and nonfood prices separately. These indexes weight each index of individual price difference Π_r by the average budget share of that category in the two cities being compared. The overall index is then

$$\Pi^{\Delta}(c, c') = \sum_r (E_{rc} + E_{rc'})\Pi_r(c, c')/(E_c + E_{c'})$$

where E_c and $E_{c'}$ are the sums of the shares for the categories included.[9] The absence of an upper bound on the Π_r means that there is no maximum to the index Π^{Δ}.

An index of price dissimilarity for food alone is defined by

$$\Pi^{\Delta_f} = \sum_r (E_{rc} + E_{rc'})\Pi_r(c, c')/(E_{(\text{food})c} + E_{(\text{food})c'})$$

and for nonfood by

$$\Pi^{\Delta_n} = \sum_r (E_{rc} + E_{rc'})\Pi_r(c, c')/(E_{(\text{nonfood})c} + E_{(\text{nonfood})c'})$$

where the sums are over food and nonfood categories respectively. It follows that

$$\Pi^{\Delta} = \frac{(E_{(\text{food})c} + E_{(\text{food})c'})\Pi^{\Delta_f} + (E_{(\text{nonfood})c} + E_{(\text{nonfood})c'})\Pi^{\Delta_n}}{E_c + E_{c'}}.$$

To see what effect price dissimilarities have on differences in budget structure, we estimate relations of the form

$$\Delta = \alpha_0 + \alpha_1 \Pi + \alpha_2 Y$$

where Δ is one of the six budget indexes and Π is the measure of price difference which *a priori* seems most clearly related to it. Several price indexes cannot be used in one equation because of the small number of comparisons and because of correlation among the price variables:

Correlation

	Π_{food}	Π_{meat}	Π_{housing}	Π^{Δ}	Π^{Δ_f}	Π^{Δ_n}
Π_{meat}	−0.028					
Π_{housing}	−0.412	−0.049				
Π^{Δ}	0.252	0.460	0.445			
Π^{Δ_f}	0.681	0.348	−0.303	0.671		
Π^{Δ_n}	−0.356	0.246	0.901	0.632	−0.146	
Y	−0.194	0.697	−0.069	0.286	0.155	0.222

[9]Since the price and budget classifications differ, some categories cannot be included, and therefore $E_c, E_{c'} < 100$. "Other foods", non-durable goods, private transportation (both vehicle purchase and use), ceremonies, insurance, transfers and other non-consumption are omitted. "Clothing" does not include children's clothing, and education is omitted because the price data refer to public costs rather than to costs borne or prices faced by families.

TABLE 10

INDEXES OF DISSIMILARITY AS FUNCTIONS OF INCOME DIFFERENCES AND VARIATION IN THE LEVEL OR STRUCTURE OF PRICES
(Capital Cities and Ecuador Only)

Index	Mean (and Standard Error of Mean)	Regression Coefficients (and Standard Errors)			R^2 (and Adjusted R^2)
		Constant	Price	Y	
Δ	32.17	26.00	$7.72\Pi^{\Delta}$	8.93†	0.265
	(1.48)	(6.24)	(26.23)	(4.73)	(0.142)
$\Delta_{f,n}$	15.12	8.13	$34.65\Pi_{food}$	5.47	0.114
	(2.16)	(6.18)	(30.83)	(7.39)	(−0.034)
Δ_f	25.24	24.78	$-7.02\Pi^{\Delta_f}$	4.56	0.157
	(0.97)	(2.90)	(10.06)	(3.22)	(0.017)
Δ_p	10.52	11.08	$-2.06\Pi_{meat}$	−0.23	0.004
	(1.83)	(3.76)	(15.03)	(9.08)	(−0.162)
Δ_n	29.97	23.38	$22.80\Pi^{\Delta_n}$	2.60	0.163
	(1.32)	(4.55)	(18.35)	(4.41)	(0.023)
Δ_h	18.59	7.26	$17.90\Pi_{hsg}$†	13.75*	0.472
	(1.93)	(3.84)	(9.06)	(5.01)	(0.384)

*Significant at the 90 percent confidence level.
†Significant at the 80 percent confidence level.

The results of the regression analysis appear in Table 10. To facilitate comparison with the results obtained when all eleven cities are studied, we also estimate relations of the form

$$\Delta = \alpha_0 + \alpha_1 G + \alpha_2 Y$$

(Since Quito is in the mountains while Guayaquil is on the coast, G is 0.5 for comparisons involving Ecuador). The results of this analysis appear in Table 11.

In general, regressions with the smaller number of cities give results as good (or as poor) as with the full set of comparisons, but individual coefficients are more often negative. In both specifications, income clearly accounts for dissimilarities in the housing share and in the overall budget structure. The indexes $\Delta_{f,n}$ and Δ_h are both better explained by a price variable than by simple geographic distinctions, whereas for Δ_f and Δ_n, G gives a slightly better fit than measures of difference in price structure. It appears that prices are important for explaining budget differences which can be assumed to depend heavily on a *single* price index such as the price of food or the price of housing. It is much harder to measure dissimilarities in a structure of *many* prices, so that at a more disaggregated level geography is good proxy for the collection of differences of prices and of tastes.

VI. SUMMARY

It appears from these analyses that differences in real income between cities account for much of the difference in the share of the consumer budget devoted to food, which in turn is a major source of overall budget dissimilarity. Within

TABLE 11

INDEXES OF DISSIMILARITY AS FUNCTIONS OF DIFFERENCES IN INCOME AND LOCATION
(Capital Cities and Ecuador Only)

Index	Constant	Regression Coefficients (and Standard Errors)		R^2 (and Adjusted R^2)
		G	Y	
Δ	27.73	−0.13	9.36*	0.260
	(3.10)	(3.59)	(4.61)	(0.136)
$\Delta_{f,n}$	14.76	−3.24	4.55	0.045
	(5.13)	(5.94)	(7.64)	(−0.115)
Δ_f	24.87	−3.58†	4.98†	0.266
	(2.02)	(2.34)	(3.01)	(0.143)
Δ_p	13.04	−4.30	−0.18	0.060
	(4.31)	(5.00)	(6.42)	(−0.096)
Δ_n	25.55	5.56†	2.63	0.242
	(2.79)	(3.23)	(4.15)	(0.115)
Δ_h	10.40	4.05	12.21*	0.347
	(3.79)	(4.39)	(5.64)	(0.238)

*Significant at the 90 percent confidence level.
†Significant at the 80 percent confidence level.
Correlation $(G, Y) = 0.167$.

the food and nonfood budgets separately, income differences are of less importance, prices and preferences being more significant. Budget structures tend, for this reason, to be similar for different cities in the same country. Because housing costs differ markedly between coastal and interior cities, the nonfood budget structure varies according to geographic location as well as country. The results for income and country might be expected to hold for comparisons among other groups of cities (at least so long as they had similarly shaped income distributions), but the geographic effect may well be peculiar to Latin America. (In other parts of the world, other indicators of climatic difference might be significant).

The available price data help account for budget dissimilarities which depend on the price of a single, large category, but they are of rather little help in understanding differences in structures involving many categories. In particular, they account for very little variation in food budget structure, but are of more weight in the nonfood budget. Since the analysis is based on shares of expenditure, price elasticities must differ from −1.0 in order for prices to have any effect on the composition of the budget. Uncompensated price elasticities for foods might be expected to be closer to zero, and thus farther from unity, than for nonfood categories; however, compensated elasticities seem to cluster around unity more for food. Considerable room remains in these findings for inter-city differences in taste or needs, although differences may not reflect fundamental cultural preferences but simply differences in microeconomic features not captured by these aggregate indexes, and particularly in the distribution of certain household characteristics which influence family spending.

REFERENCES

Barten, A., "Comment" on Meyer (1973).

Chaigneau, S.,with the assistance of R. Szalachman, "Estructura del Gasto", Documento de Investigación No. 7 (Santiago: Departamento de Economía, Universidad de Chile, August 1976).

Fernández A. and B. A. de Khan, *ECIEL, Estudio de Consumo: Venezuela* (Caracas: Banco Central de Venezuela, in press 1976).

Figueroa, A., *Estructura de Consumo y Distribución de Ingresos en Lima Metropolitana, 1968-1969* (Lima: Pontificia Universidad Católica del Perú, 1974).

Kravis, I., "International and Intertemporal Comparisons of the Structure of Consumption", in L. H. Clark, ed., *Consumer Behavior* (New York: Harper, 1958).

Meyer, A. C., "International Comparison of Consumption Patterns", paper presented to the Conference sponsored by ECIEL and held under the auspices of the Institut für Iberoamerika Kunde (Hamburg: October 1973). Also published as "Diferencias Internacionales en los Patrones de Consumo", *Ensayos ECIEL 1* (November 1974).

Musgrove, P., *Income and Spending of Urban Families in Latin America: The ECIEL Consumption Study* (Washington: The Brookings Institution, forthcoming).

Prieto, R., *Estructura del Gasto y Distribución del Ingreso en Cuatro Ciudades Colombianas* (Bogotá: Universidad de los Andes, 1971).

Salazar-Carrillo, J., "Price, Purchasing Power and Real Product Comparisons in Latin America", *Review of Income and Wealth*, Series 19, No. 1 (March 1973).

———, "The Structure and Level of Prices and Purchasing-Power Parities in Latin American Countries" (Washington: The Brookings Institution, 1977, mimeographed).

Vega, M., "Tipos de Cambio, Paridades y Poder Adquisitivo en el Grupo Andino", *Ensayos ECIEL 2* (August 1975).