

THE ROLE OF FOOD MARKETING IN THE ECONOMIC DEVELOPMENT OF PUERTO RICO

SEMINAR SUMMARY • EDITED BY ROBERT W. NASON



Research Conducted by:
Michigan State University
Latin American Studies Center

University of Puerto Rico
Social Science Research Center



Research sponsored by:
U. S. Agency for International
Development

Commonwealth of Puerto Rico
Department of Commerce

THE ROLE OF FOOD MARKETING IN THE
ECONOMIC DEVELOPMENT OF PUERTO RICO

Summary of the Seminar
Held June 8-10, 1966
San Juan, Puerto Rico

Edited by
Robert W. Nason

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1966

Latin American Studies Center
Michigan State University
East Lansing, Michigan

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LATIN AMERICAN FOOD MARKETING STUDY

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FOREWORD

This seminar has been a part of research efforts to understand more fully the role of marketing in the process of development. Sponsored by the United States Agency for International Development, this research study ("The Role of Food Marketing in the Development of Selected Latin American Areas") represents a departure from the more traditional approaches. It examines first the experience in Puerto Rico, where a Latin culture has experienced a rapid development in close association with the U.S. economy. A second phase of this research assignment will be conducted in a rather large metropolitan area of Latin America; it will examine the market structure and consequences of changes in marketing systems.

The approach to this problem has been interdisciplinary, bringing together marketing, agricultural economics, communications and systems engineering skills. The study has been the product of cooperation between universities from the United States and Puerto Rico. While Michigan State University has been the contractor for the United States Agency for International Development sponsored research, the Social Science Research Center of the University of Puerto Rico has received the active, technical and financial support of the Department of Commerce, Commonwealth of Puerto Rico. Both of these sources of support and the research institutions have merged their efforts to conduct the study. The Social Science Research Center at the University of Puerto Rico had, however, previously been the focus of research into the problems of marketing, leading to the publication of Marketing Efficiency in Puerto Rico by Kenneth J. Galbraith and Richard Holton, a valuable benchmark for this research.

The research was in the field from June '65 to June '66. Reports are being prepared, including three doctoral dissertations and an equal number of master's theses. A research report of this phase of the work will be prepared this fall.

The seminar proved to be a valuable testing ground
for ideas being worked out for the research reports.

Dr. Charles C. Slater
Co-Director of Research

Dr. Harold M. Riley
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PREFACE

At the culmination of the field research in Puerto Rico a three day seminar was held to gain the critical review and suggestions of those who had so freely supported the Latin American Food Marketing Study effort. The widely based group that met at the La Concha Hotel in San Juan on June 8, 9, and 10, 1966, included scholars, businessmen, government officials, and representatives of related research projects from Puerto Rico, the United States, and a number of other Latin American countries.

Because of the number of participants in the seminar (80) the length of the material presented, and the diversity of the presentation, it became evident that a summary of the proceedings was needed. Thus, this publication has been developed for the use of the seminar participants who will be able to view this material in the broader context of the seminar itself.

No attempt has been made to add new material to that given at the seminar but only to summarize the basic points presented. The organization of this publication, then, follows directly that of the seminar.

The editor is indebted to the conference contributors who spent many hours condensing the seminar material from transcribed tapes of their presentations.

Also much credit is due Joellyn Risch and Marilou Peterson who willingly shouldered much of the extra burden of preparing this publication.

Finally, a special thanks goes to Mrs. Charles Slater who transcribed from often difficult tapes the full proceedings of the seminar; José Santiago and Frank Doane who aided in the preparation of this publication; and Marilyn Pretzer, Linda Stanley and Suzanne Ludwig whose editorial help was invaluable.

Robert W. Nason
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CHAPTER 1

INTRODUCTION

Presented and Summarized by
Charles C. Slater

Chapter 1

This three-day seminar assembles a group of people concerned with the role of food marketing and economic development, and includes representatives from Latin American countries, the U. S. Agency for International Development, scholars and government representatives concerned with the development, industrialists and agricultural specialists from the U. S. mainland, Latin America and Puerto Rico. The researchers from Michigan State University, the University of Puerto Rico, and the Department of Commerce of the Commonwealth of Puerto Rico who have conducted this year-long study program welcome the opportunity to convey the preliminary findings and to hear comments and questions of the highly qualified group assembled. The diversity of talents and interests here at this seminar reflect the complexities of the role of marketing in economic development.

The study reported in this seminar is the first phase of the research project designed to explore and evaluate the role of food marketing in economic development. The research will continue in another major metropolitan area in Latin America to assess how reforms in food marketing can improve the efficiency of the system and favorably affect development. The

Research Division of the United States Agency for International Development and the Department of Commerce of Puerto Rico have jointly sponsored the first phase of the year-long study here in Puerto Rico.

The marketing of food may seem a mundane element of the process of development where efforts have been focused on the building of roads, dams, bridges, power plants, and other major capital infrastructural requirements of the technically advanced society. Interest in development planning has only recently shifted to the problems of marketing, from the prior emphasis on infrastructural build-up, agriculture productivity improvement, education and health.

Dr. Walter W. Rostow has probably been the most articulate and innovative student of the problems of internal market development. His work has shown the need to study in detail the process of market operations as a system, vital to both urban development and improvement of agricultural incomes.

It has been observed that a good many farm operators in underdeveloped areas are willing to risk market farming because of uncertainties of the market. Price fluctuation or demand changes can seriously affect them, if they depend fully upon market sales for their income. The rewards of market farming can be great; the risk, however, is often so high that price changes might mean starvation to some members of their family. This is still true for certain areas of Latin America today. As a result, there is a need to understand market institutions and the way people feel about market processes in order to understand how marketing institutions can be changed and improved.

Lower income peoples spend half or more of their income for food, particularly

in urban areas of underdeveloped parts of the world. Since much of this expenditure goes for marketing services, it is important to understand the role of marketing services and how they might be made more efficient to increase the real income of the low-income urban people. Because risks seem to impede food reaching cities, inflation amid want exists in many cities of the world. A coordination process appears lacking.

Puerto Rico has tackled the problem of marketing development, stimulating new hopes rather than maintaining the check and balance of a static system designed merely to maintain the structure of the present institutions and present distribution of resources. Puerto Ricans have willingly created new institutions and modified older organizations to adapt to changing needs. Although Puerto Rico has a close relationship with the United States, its economic development problems are different in many respects. Puerto Rico has experienced rapid change and growth of income. At the same time, the story of changes in institutions which have accompanied this growth have been well documented. Thus, it is important to develop research instruments for measuring the attitudes in a Latin community, particularly when the other changes have been occurring and have been well documented.

Analysis of this problem involves an interdisciplinary approach. We have brought together marketing, agricultural economics, communications, and systems engineers specialists. This study covers the historic changes in marketing activities and the attitudes of market operators, farmers, assembly operators, processors, importers, wholesalers, retailers, on through to consumers. Finally, the impact of government and other public change agents has been appraised.

In the conduct of this study it was

assumed that market institutions could be subjected to study by institutional and behavioral and systems methods and that market institution reform could reduce risk, cut costs and better coordinate market processes. Our study is not as yet complete. Not all of the data has been fully analyzed from our several surveys, and thus, the researchers here ask the other seminar participants to comment and suggest actions which will improve the final report and the recommendations which will arise from this study.

CHAPTER 2

DEVELOPMENT OF THE PUERTO RICAN ECONOMY

Presented and Summarized by Harold M. Riley

Introduction

The purpose of this chapter is to provide an overview of selected aspects of the Puerto Rican economy. It is largely descriptive of the conditions and the events which have been associated with a rapid rate of economic growth. This information is useful in understanding the environmental conditions within which significant changes in the food industry have occurred.

Geographic Characteristics

Puerto Rico is the eastern-most island of the Greater Antilles. Since its discovery by the Spanish in 1493 it has continued to have strategic importance in the protection of commerce routes serving the Caribbean area.

The island is about 35 miles wide and 100 miles long. The terrain is mountainous with an irregular band of fertile coastal plains. The climate is tropical although temperatures are modified by northeasterly trade winds. The rainfall pattern is extremely variable, ranging from 60 to 80 inches along the north coast to 30 inches or less in the southwestern part of the island.

Until recently agriculture has been the major industry in Puerto Rico with sugar cane, tobacco, coffee, fruits and vegetables being the principal cultivated crops. Milk, poultry and egg production has increased rapidly in the past 15 years.

Puerto Rico has a high population density of approximately 700 persons per square mile. About one-half of the population is urban. The largest cities are San Juan with a population of 700,000 in the metropolitan area, Ponce with 150,000 and Mayaguez with 85,000. The total population of the island was 2.6 million in 1964.

Political History

Between 1493 and 1898, Puerto Rico was governed as a Spanish colony. During that time the San Juan harbor played an important role in the protection of Spanish trade routes. Efforts were also made to colonize the island with emphasis on sugar and cattle production. Negro slaves were imported during the 18th and 19th centuries to work in the sugar industry.

As a consequence of the Spanish-American War, Puerto Rico became a protectorate of the United States in 1898. This opened free trade relationships with the U. S. mainland and stimulated the flow of investment capital in the Puerto Rican sugar and tobacco industries.

In 1917 the United States extended citizenship privileges to Puerto Ricans, thus removing any political barriers to emigration and travel between the island and the mainland.

Between 1898 and 1948 the governors of the island were appointed by the President of the United States. Although the Puerto Ricans had their own local legislative body, the public administration of the island was dominated by the policies of the United States government as interpreted by the appointed governors.

A political, social and economic revolution began to get underway in Puerto Rico around 1940. This movement grew out of the human misery and widespread poverty of the 1930's. Luis Munoz Marin, whose life has been detailed by Thomas Aitken, Jr. in a recent book, Poet in the Fortress, emerged as an outstanding political leader to establish the Popular Democratic Party in 1938. The slogan of the party was "Pan, Tierra y Libertad" (Bread, Land and Liberty). In

his campaigning Munoz attempted to convince the people in all walks of life that they held within their hands the power to change their living conditions. After his election to the legislature in 1940, Munoz worked closely with Governor Rexford Tugwell to initiate and carry forth a number of political and economic reform programs. This marked the beginning of an active program to foment the development of Puerto Rico and to improve the level of living for the masses.

In 1948, Munoz became the first elected governor of Puerto Rico. By 1952 he had laid the groundwork for a change in political status of the island which was institutionalized as the Commonwealth of Puerto Rico (Estado Libre Asociado). This status extended to the island nearly all the privileges of statehood. A notable exception is that the island's elected representatives to the United States Congress do not have voting privileges in the legislative body. Because of this Puerto Ricans are not required to pay federal income taxes. Nevertheless, Puerto Rico participates in and receives substantial benefits from federal programs in health, education, housing, credit and other areas.

Without a doubt the close association with the United States has fostered the development of the Puerto Rican economy. In addition to the direct commercial ties, the political and fiscal stability has provided a favorable environment for economic growth. The effects of education and the cultural interchange with the mainland have no doubt had a significant influence on the attitudes and aspirations of Puerto Ricans regarding social and economic change.

Economic Take-off

During the 1940's various economic reform programs were initiated in Puerto Rico. These reforms included the creation of several "authorities," among which was a Land Authority to carry out a land reform, and authorities for transportation, communications and water resource development. There was also established a government development bank and an industrial development company. A central planning agency was created to coordinate development planning activities.

In the staffing of these agencies an effort was made to attract young, well-trained individuals dedicated to the development task. This contributed to creation of public trust and confidence in the government as a means to bring about improved levels of living.

During the early phase of the development effort the Puerto Rican government entered into the ownership and operation of some manufacturing plants. The results were not encouraging. By 1947 it began selling off these plants and shifted the emphasis of its industrial development program toward the support of private enterprise. A Department of Fomento was established to coordinate the expansion of industry and tourism; Mr. William Stead describes this department in a National Planning Association pamphlet called Fomento-The Economic Development of Puerto Rico.

The entire range of development programs became known as "Operation Bootstrap." By 1965 the industrialization program had helped promote the establishment of 1,211 manufacturing plants providing a total employment for 82,175 persons.

Measures of Growth

Puerto Rico has experienced a high rate of economic growth over the past 25 years. In 1940 per capita incomes and levels of living were similar to those in other Caribbean Islands and in many other Latin American communities. Between 1940 and 1965 real income per capita nearly tripled. During the 1950's the average rate of growth in per capita income was 5.1 percent per year, one of the highest in the world.

There has been a noticeable shift in the relative importance of different sectors of the Puerto Rican economy when measured in terms of output and employment (Tables 2.2. and 2.3). Between 1950 and 1964 agriculture declined sharply while manufacturing, construction and other services made substantial gains.

Unemployment decreased only slightly over the past 15 years and was estimated to be 11 percent of the labor force in 1964.

TABLE 2.1

Gross Domestic Product, Population and Per Capita
Income, Puerto Rico (1954 dollars)

Year	G D P Mil. Dollars	Population Thousands	Gross Product Per Capita Dol.
1940	499	1,869	269
1950	879	2,211	399
1960	1482	2,350	638
1965	2083	2,626	807

Source: Planning Board, Commonwealth of Puerto Rico.

The growth in human population averaged 1.2 percent per year between 1950 and 1964. This is considerably less than the rates of growth in many Latin American countries. It is interesting to note that the crude birth rate declined from 40 per thousand to 30 per thousand between 1950 and 1964. During the corresponding period death rates dropped from 10.5 per thousand to 6.5 per thousand. The net migration of Puerto Ricans to the United States mainland has been an important factor in holding down population growth rates. Over the past 15 years the net out migration was 1 ½ percent of the population per year. Without this migration population growth rates would have been more than doubled and about equal to the rates in many of the less developed countries.

Puerto Rico is highly dependent upon external trade with more than 90 percent being with mainland United States. In 1964 imports were equal to 36 percent of total gross domestic product while exports were equal to 54 percent of gross domestic product.

There has been a high rate of investment supporting the rapid growth of the Puerto Rican economy. Investment rates increased from 8 percent of G D P in 1940 to 15 percent in 1948-1952 and 25 percent in 1961-1965. Between 1943 and 1960, 43 percent of the capital came from external sources. Only 7 percent of investment came from savings in the private sector. Depreciation and public savings provided the balance

TABLE 2.2

Percent of Net Product by Industry Sectors, Puerto Rico,
1950 and 1964

Industry	Percent of total domestic product	
	1950	1964
Agriculture	24	10
Manufacturing	14	23
Construction	4	7
Trade	17	17
Government	19	19
Other	<u>22</u>	<u>24</u>
TOTAL	100	100

Source: Planning Board, Commonwealth of Puerto Rico.

TABLE 2.3

Employment by Major Industries, Puerto Rico
1950 and 1964

Industry	Number of Persons	
	1950	1964
Agriculture	216	140
Manufacturing	55	106
Other	<u>325</u>	<u>408</u>
TOTAL employed	596	654
TOTAL unemployed	88	82

Source: Planning Board, Commonwealth of Puerto Rico.

of investment funds.

Conclusion

Puerto Rico has undergone rapid economic change over the past two decades. This was triggered by the social and political ferment of the late 1930's. Much credit for this transformation goes to the political leaders and the public servants who have devised effective reform programs and have carried them out with dedication and responsibility. Undoubtedly Puerto Rico is different from many other developing countries with regard to political and economic stability and its close commercial ties with mainland United States. Nevertheless the changes have been striking and some of the approaches to fomenting development seem relevant to the problems in other Latin American communities.

CHAPTER 3

CONSUMPTION AND DEMAND CHANGES

The Consumer: Some Comments

Presentation by Dr. James D. Shaffer
Summarized by Robert W. Nason

The purpose of this section is to state briefly three considerations regarding consumer analysis and then to outline the several uses of the consumer survey research which was performed this past year.

The first consideration deals with consumer change. It is easy for marketers to concentrate on the technical problems of coordinating the marketing system and neglect the really essential problems and requirements of the consumer. It is only within certain limits that the marketing system can be changed without violating the basic social and economic habits of the consumer.

On the other hand, there are many possible market system changes that the consumer does not believe possible. If one had asked consumers at the time of the Galbraith-Holton study if they would be willing to shift to supermarkets, the answer would probably have been no. Yet, the extent to which many Puerto Ricans have shifted to supermarkets indicate their willingness to change.

Thus, though consumers may be more adaptable than they perceive themselves, careful attention must be paid to their basic habits. This is to say that systems from other societies should not be directly imposed on developing areas. In this light, it seems desirable to have a marketing system in Puerto Rico that provides retail facilities which are close to the consumer.

The second consideration deals with the notion of underconsumption. One of the hypotheses which has been mentioned is the thesis that there is a lack of effective demand in underdeveloped economies, however, the statistics concerning Puerto Rico do not indicate such a lack. In fact, the personal savings in this economy have been negative or zero for the past fifteen years. The savings and investments have come from other sources. Consequently, the emphasis of savings as a means of economic development needs to be carefully evaluated.

The third consideration deals with the significance of the government free food program; the impact of this program on economic development has been extensive.

The uses for the consumer research performed this past year are three-fold. First, it is important to understand the effect of development on the consumer and, further, the effect of the consumer on economic progress. Through economic and attitude measurement the nature of the consumer in Puerto Rico has been determined. Secondly, the consumer data provides an input for the systems model which is being developed for Puerto Rico. This model will be described later in this publication. Finally, it should be pointed out that the survey data provides a background to help social scientists conceive of new institutions that can be adopted to the society under consideration.

Changing Patterns of Consumption and Demand

Presented by Idalia Rodriguez
Summarized by Robert W. Nason

Introduction

This section is devoted to the presentation of selected statistics which give a partial picture of the consumer and consumer demand in Puerto Rico. First, demand will be analyzed as a function of population size, spending power, and willingness to spend. Second, some consumer characteristics will be noted. Third, the place of food purchase will be explored. Finally, consumer attitudes concerning food distribution will be reviewed.

Demand

Population. In 1960, 44 percent of the 2,349,000 Puerto Ricans were urban dwellers. During this period of 1940-1960, the rural population remained constant while the urban population doubled.

Income. From 1940 to 1965 per capita income increased from \$118 to \$905 (current dollars) or from \$213 to \$748 (1954 dollars). The median family income in 1953 was \$1,287 and by 1963 had increased to \$2,308. Table 3.1 presents the distribution of families by income for 1953 and 1963.

Consumption. The willingness of consumers to spend is evidenced by the fact that during the years 1950 to 1965 personal expenditures have equaled or exceeded disposable income. Changes in food consumption are characterized by rapidly increasing per capita consumption of dairy products, meat, eggs, fish, and green and leafy vegetables, while per capita consumption of coffee, starchy vegetables and sugar has dropped. It should be noted also that the government free food program has been increasing the distribution of free food and in 1964 represented about 4.3 percent of the total food expenditure.

Summary. Hence, the existence of effective demand is well established.

TABLE 3.1

Distribution of Families by Income Levels

Level in Dollars	Percent of Families	
	1953	1963
1,000	39	17
1,000-1,999	39	27
2,000-4,999	18	38
5,000-	4	18
TOTAL	100	100
MEDIAN	\$1,287	\$2,308

Selected Consumer Characteristics

The surveys of consumers were carried on in San Juan and Mayaguez to contrast a modern urban area with a more traditional one. The average family size was 4.89 persons in San Juan and 4.18 in Mayaguez. In both cities nearly all families owned refrigerators, about half owned cars, very few had maids who purchased the food, and 20 percent in San Juan and 15 percent in Mayaguez had wives who worked outside of the home.

The purchasing decisions for food buying were largely made by the female head in both cities; however, San Juan had a higher percent of female-head decision makers (83%) than did Mayaguez (75%). The person who actually purchased the food was again predominately the female head in both cities, but the percentage of female head purchasers was lower (San Juan 77%, Mayaguez 55%) than the percentage for decision makers. Joint female and male decision making and purchasing accounted for about 10 percent of the families in both San Juan and Mayaguez.

Food Retailers Used

Table 3.2 depicts the major differences in the distribution of food retailers used between San Juan and Mayaguez. In summary, a higher percentage of householders in San Juan use supermarkets than do those in Mayaguez.

TABLE 3.2

Principal Food Retailers Used

Type of Outlet	Percent of Households	
	San Juan	Mayaguez
Supermarkets	61	38
Colmados & Cafetin	34	57
Market Plaza	0	3
Other	3	2
No Answer	<u>2</u>	<u>0</u>
	100	100

Considering briefly only San Juan respondents, 35 percent of the families using supermarkets walk to supermarkets, 46 percent ride in private cars, and 18 percent use public transportation, while 87 percent of the families who use colmados walk to the store. Only 8 percent of the supermarket users obtained credit while 48 percent of the colmado users obtained credit. About one-fourth of the supermarket users and the colmado users had their purchases delivered. The supermarket users shopped on the average of 1.1 times per week while the colmado users shopped on the average 2.2 times per week.

It was found that generally supermarket shoppers were younger and more educated than shoppers using other food retailers. Further, it was found that a higher percentage of supermarket shoppers versus shoppers using other food stores had family incomes of \$2,000 or more, had been outside of Puerto Rico, and owned cars.

Finally, the reasons given for using various types of food stores by the respondents offer clues as to the nature of both the retail system and the consumers themselves. San Juan supermarket users cited convenience (closeness) and variety as important, while Mayaguez supermarket users viewed fresh quality and low prices as most significant. Colmado, carniceria, granja, and panaderia users in both cities saw convenience (closeness) and fresh quality as vital. Finally, the plaza de mercado users in both cities cited fresh quality and variety as the main reasons for shopping at this type of food outlet.

Consumer Attitudes Toward Supermarkets

The following statistics are based on the San Juan and Mayaguez surveys. The comparisons were made on the basis of place of buying (supermarket vs. non-supermarket): Age (under 35 years vs. 35-54 years vs. over 54 years): Education (under 7 years vs. 7-12 years vs. over 12 years): Income (low vs. medium vs. high): and modernity (modern versus traditional). The modernity for each respondent was calculated from seven attitude questions which dealt with the respondent's perceived view of his influence on his future. Those who felt they could influence their future were defined as modern while those who felt they could not were defined as traditional.

1. About 70 per cent of all consumers interviewed felt that large supermarkets should be government regulated before they drive the small food stores out of business.

2. Yet, 80 per cent of the respondents felt that it was more enjoyable to buy in large supermarkets than in small stores. However, only 73 per cent of the non-supermarket shoppers and 73 per cent of the low-income consumers agreed on this point.

3. Of those interviewed, 77 per cent felt that the quality and variety of food is better now than ten years ago. This view was held more often by supermarket rather than by non-supermarket buyers, modern rather than traditional consumers, younger rather than older consumers, more educated rather than less educated consumers, and higher rather than lower income consumers.

4. About 50 percent of the consumers sampled did not trust supermarket advertisements for specials, with the traditional and the less educated consumers being the most apprehensive.

5. About 60 percent of the respondents felt prepackaged fruits and vegetables to be risky; San Juan consumers, traditional consumers, and less educated consumers hold this view most frequently.

6. Roughly 26 percent of the consumers sampled felt that food scales were fixed to favor the retailer. The traditional consumers, older consumers, less educated consumers, and lower income consumers predominated in the group who held this view.

7. Approximately 84 percent of the respondents felt the need for regulation of meat processing and 90 percent felt the need for more and better information on price and product quality.

Concluding Observations

Presentation by John R. Wish
Summarized by Robert W. Nason

The surveys taken this past year show that refrigerator and car ownership has increased markedly since the 1960 census. This five-year growth of ownership can be attributed in large part to the willingness of Puerto Rican banks to make personal loans for such durable goods. Further, the furniture stores themselves extend a great deal of credit. In one sense these purchases ought to be considered consumer investments. Certainly, they have spurred additional business and thereby caused increased investment.

Related to the above point, the low level of personal savings or, put another way, the high level of demand, has created employment. However, because investment has not been forthcoming from the population it has had to come from business, the government, and external sources.

It should be pointed out that the past year's surveys indicated that in general, servants of families in Puerto Rico did not do the shopping for the family. This point counters a commonly held view.

Finally, it was maintained earlier that Mayaguez consumers made less of their purchases in supermarkets. It should be noted that in San Juan there is about one supermarket for 2,000 persons, while in Mayaguez there is about one supermarket for every 10,000 persons.

CHAPTER 4

DISTRIBUTION SYSTEM

Wholesale and Retail Food Distribution in 1950

Presented and Summarized by José Santiago

Introduction

The purpose of this section is to picture in a general way the channels of sales and the distribution situation of food products as it existed in 1950. Some information on transportation will also be given in this section. The information for this section was obtained from the book, Marketing Efficiency in Puerto Rico by John K. Galbraith and Richard H. Holton, annual reports from government and private agencies, and some personal interviews.

Channels of Food Distribution in 1950

Chart 4.1 portrays the channels for food in 1950. It shows the flow from producer to importer, to broker, to trucker, to wholesaler, to retailer, to ultimate consumer and the interrelationships of some of these processes. This is a complex system. There is heavy credit activity at all levels of distribution. Dependence on credit had a detrimental effect on competition because some businessmen were forced to buy only from suppliers who would give them credit. There was a tendency for small retailers and those in rural areas to depend on few wholesalers (Here, less than 12 wholesalers are considered to be few while more than 12 are considered to be many). Purchases were made in three ways: (1) direct to the mainland, (2) through an agent, and (3) through another wholesaler.

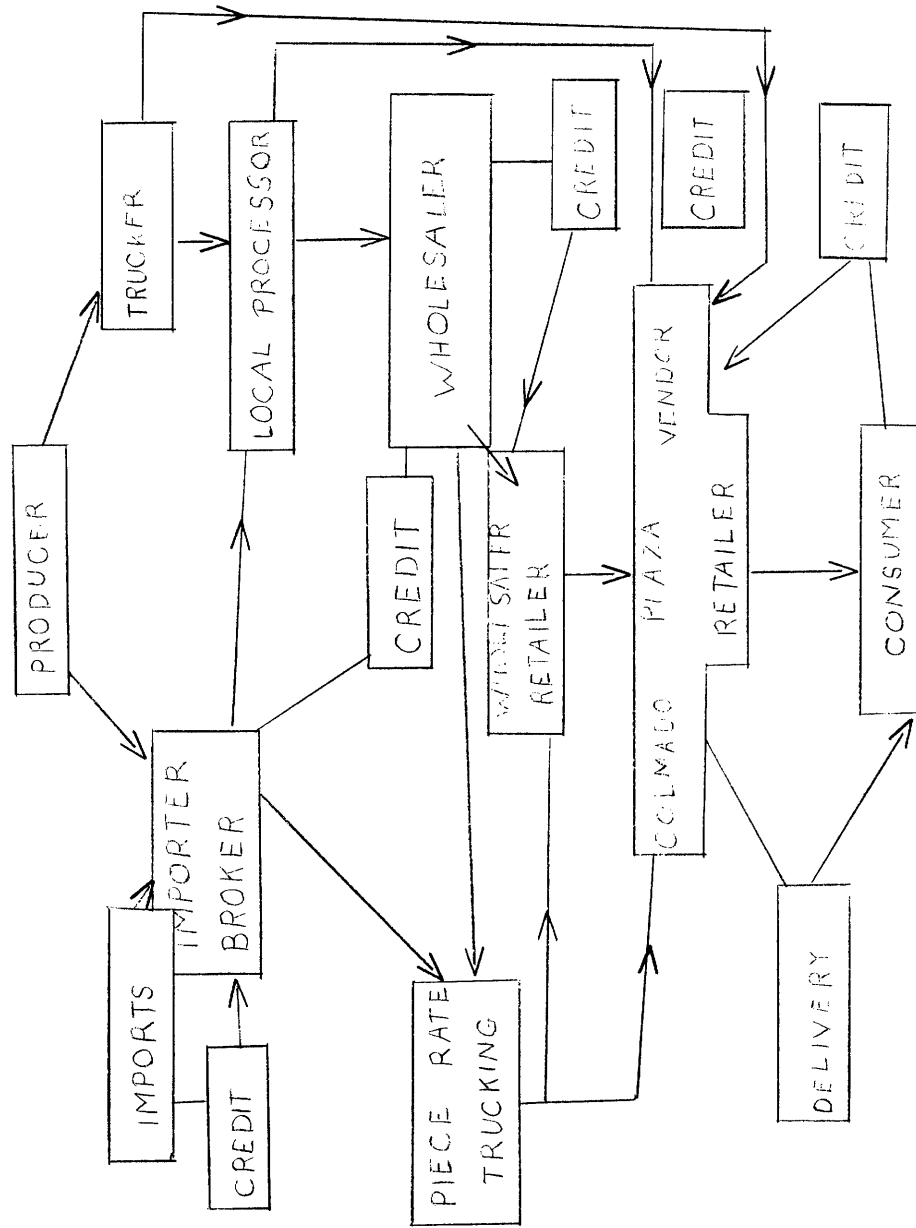


CHART 4.1
CHANNELS FOR FOOD-1950

Food Wholesaling in 1950

In food wholesaling (other than plaza sales) there were 434 wholesalers in 1950, with average yearly sales of \$414,000 for all firms. Most firms were much smaller. A large number of firms had low sales volumes. Seventy percent of sales were staples (rice, sugar, codfish, etc.), while 19 percent were canned goods. In comparison, in 1963 there were 539 wholesalers with an average yearly sales of \$755,000. About 50 percent of the food consumed in 1950 was imported.

Table 4.1 shows the degree of importation of some of the imported products. The highest percentages shown are fats and oils, 95.3 percent, cereals, 88.5

TABLE 4.1
Food Products Imported Into Puerto Rico
1950-1951

Product	Dollars (thousands)	Percent Imported
Dairy Products	541	39.5
Eggs	21	33.3
Meat, Poultry, Fish	109	48.6
Cereals	428	88.5
Starchy Vegetables	645	15.3
Green Vegetables	66	39.3
Fruits and Tomatoes	118	29.6
Legumes and Nuts	86	74.4
Fats and Oils	<u>64</u>	95.3
	\$2,078	

percent, and legumes and nuts, 74.4 percent. There was limited production of these items in Puerto Rico and dependence on their import was heavy. On the other hand, where food was locally produced, imports were low: e.g. starchy vegetables, 15.3 percent; fruits and tomatoes, 29.6 percent; and eggs, 33.3 percent.

Wholesale gross margins averaged 14 percent in 1950. By 1963 the wholesale gross margin had dropped to an average of 8 percent.

Wholesale stock turns were around two per year in 1950. Today there is an average of eight turns per year (In the U. S. the average is 13 turns per year.). Inventories in 1950 varied widely and in many cases had no relationship to sales volume. There was no apparent desire to expand in 1950.

Food Retailing in 1950

Store Size and Characteristics. There were 16,746 food stores in 1950 which together sold over \$109,112,000. Of all grocery stores, 87 percent, or 14,500 stores, sold less than \$10,000 per year each. In comparison, in 1963 there were 22,526 food stores selling over \$411 million. Sixty-five percent of the grocery stores, or 13,000 stores, sold less than \$10,000 in 1963. It is estimated that yearly sales of \$12,000 was the minimum amount of sales needed to support one employee. In 1950 many stores had two employees, and the average sales per employee was low; the number of customers served and the dollar amounts involved were also small. Competition was not an issue in 1950. The average transaction for stores with monthly sales below \$10,000 was about \$2.00. This was due to the low income per family and the family's lack of refrigeration and storage space. Most stores carried a limited line and were combined grocery store, bar, and restaurant. Individual ownership was the main type of organization.

Credit and Delivery. Credit was offered by most retailers in 1950. Ninety-four percent of the stores made some credit sales, and more than half

of the stores sold over 60 percent of their volume on credit.

Also, delivery was made of the products purchased in 83 percent of the total sales in counter service stores and 70 percent in self-service stores.

Retailing or operating costs were high. Gross margins in 1950 were 23 percent of sales in average, but the net return to the retailer was very low.

Stores with Yearly Sales Over \$500,000. In 1949 six stores had yearly sales of at least \$500,000 each and together sold \$4,500,000. In 1958, thirty-six stores had yearly sales of at least \$500,000 each and together sold \$49,000,000. Finally, in 1963, fifty-two stores had individual yearly sales of at least \$500,000 and together sold \$84,621,000 that year. The increase from 4 percent of total sales in 1949 to approximately 40 percent in 1963 suggests that the trend is toward big stores.

Summary of Food Retailing and Wholesaling in 1950

1. Both wholesaling and retailing were characterized by a large number of stores with small sales volume.
2. Providing credit was common.
3. Corporations or formal partnerships were rare in 1950.
4. It was easy to enter the wholesale or retail business since working capital was obtained through credit from the suppliers.
5. Going into business (mostly in retail) was an alternative to unemployment or working in the sugar cane fields. Owner-managers kept complete control of the operations of the business and were unwilling to delegate authority except to other members of the family. There was no willingness to expand.
6. Competition was not an issue in 1950.

There was a "live and let live" policy among business people. There was no advertising. The only competition was through personal service, friendship, credit and delivery services.

7. Credit sales locked out competition. The channels were complicated by many wholesalers. There was heavy reliance on imports and imports were often lower priced than locally produced items.

Transportation Developments Affecting Wholesaling and Retailing

Today we have paved roads to the farms and there are more improved urban roads. Table 4.2 shows how new road construction has increased over the years.

TABLE 4.2
Progress in Road Construction

Years	Kilometers Constructed
1900-1910	688
1910-1920	367
1920-1930	584
1930-1940	571
1940-1950	1066
1950-1960	1138
1960-1970 <u>est.</u>	1575

Transportation studies are now being evaluated by various government agencies for the programming of roads and transportation. Alternative plans for

the growth of San Juan and other metropolitan areas are also under consideration. The road network improvements cut time and costs in shipment to retailer and consumer.

Table 4.3 shows the development of roads from 1920 to 1965 and the number of vehicles that use these roads. In 1965 there was one vehicle per eight persons; in 1945 there were 75 persons per vehicle. In 1963 there were 59 vehicles per mile of road; in 1965 there were 87 per mile of road.

TABLE 4.3
Road Network Improvements

Year	Km's of roads	Vehicles per 1 mi. road
1920	1263	
1940	2469	
1946	2944	
1959	4366	
1963	4980	59
1965	5450	87

To draw Chart 4.2 truckers were interviewed. They were asked to evaluate two types of road (the San Juan-Fajardo Road, a good road, and the San Juan-Guayama Road, a bad road). On the good road (Fajardo) the small and big trucks make the round trip in the same amount of time--about 2 1/2 hours. On the bad road (Guayama) the small trucks make the trip in about 3 1/2 hours, medium trucks in about 5 hours and big trucks and trailers in about 6 hours. The angle-shaped gap between the two lines is what we have called the cost of bad roads.

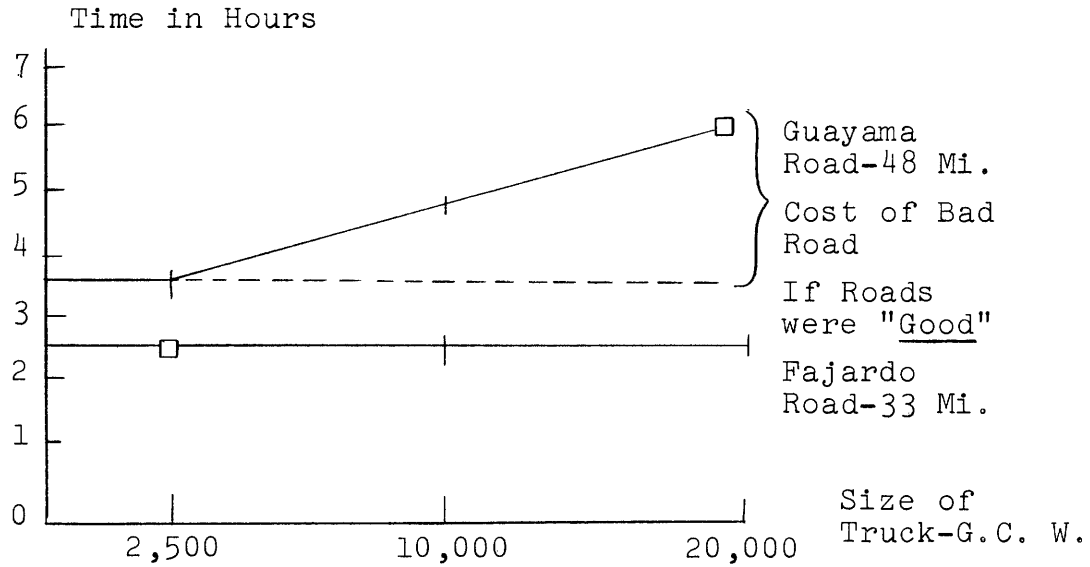


CHART 4.2
The Time Cost of Bad Roads

Some of the benefits of good roads are:

1. Reduced operating expenses
2. Lower maintenance costs
3. Fewer accidents
4. Savings in time
5. Increased comfort and convenience for drivers and passengers
6. Stimulation of economic developments

Other benefits that might be mentioned are that good roads unify territories politically and realign many communities' personal relationships.

Significant Changes in Food Transportation

The most significant development in food transportation has been "containerization" with great benefits evidenced by better quality products, less damages, lower insurance costs, and easier and faster mechanized handling methods.

The central market area with dock facilities for trailer ships has been a key development. Such facilities have been built as a result of governmental development and planning.

Some companies have developed programs for the transportation of dry and reefer cargo from mainland mixing warehouses directly to specific stores.

Retail System

Presented and Summarized by John R. Wish

Introduction

This section consists of an overview of some of the key changes in food retailing and wholesaling since 1950.

Definitions

In order to better communicate there may be some advantage in defining certain often used terms.

The most prevalent retail food store is called a colmado. A colmado is primarily a grocery store; a store where food products are sold to take home. But at the small end of size continuum, these tend to be stores where beverages and some sandwiches are sold on the premises. Thus small colmados are very similar to cafetins, which are primarily small restaurants, but sell a few goods to take home. It is frequently difficult to distinguish cafetins from colmados. In the last two Censuses of Business the Commonwealth and the U.S. Government have seen fit to combine food stores and eating and drinking establishments in one category, because of this difficulty of differentiation. Then too, with large colmados, there is difficulty in distinguishing them from supermarkets. A substantial portion of the dollar sales here in the metropolitan area now goes through supermarkets. A supermarket we define as a self-service store of at least 3,000 square feet.

In the wholesaling business there are brokers, limited line wholesalers, wholesaler-retailers and full line wholesalers. Brokers are business firms who represent specific manufacturers or processors. They aid sales by bringing potential buyers and sellers together. Brokers do not usually take title to the merchandise. For various reasons, many of the brokers have also become wholesalers in one way

or another. Therefore, a limited line wholesaler is a merchant who takes title to the merchandise he handles, but is limited in the items he carries as a wholesaler. He is limited because he is also a broker, and as a broker he is prevented by contract from handling competing lines. He may be limited line because as a wholesaler he is an exclusive agent in Puerto Rico for certain processed products. He may be limited line because he is a division of some food processor. Thus, by definition, a limited line wholesaler will be prevented from serving the entire needs of his retail customers.

Also in Puerto Rico there is a diminishing number of wholesaler-retailers. As the name implies, these establishments have not specialized as far as class of customer is concerned. The wholesaling they do is primarily to other small retailers. Finally, there are less than five full line wholesalers. The full line wholesaler is one that handles most, if not all, items sold by the retailer. Thus, the full line warehouse is the retailer's supermarket and, in contrast to the limited line, provides something approaching one-stop shopping for the retailer. In 1956 the Consumer Food Retailing Cooperatives formed a Federación with the express purpose of lowering wholesaling costs. The result was the first full line wholesaler, a warehouse where the wholesaler was not limited to what line he would handle.

Background

The dilemma of food marketing was evident in the slogan of the Popular Democratic Party in 1940. The slogan "Pan--Tierra--Libertad" implied low food prices, a high return to the farmer, and both goals brought about in a framework of freedom and liberty for all. A major plank in the party's platform was the reduction of food prices. The Popular Democratic Party, which has been in power since 1940 and still is today, has made attempts and frequently succeeded in making good on its promises. It is well to bring out here, and it will be stressed again, that the government of Puerto Rico is and has been honest. It has fulfilled its promises. The people trust the government.

In the late forties, one of the early actions of the first elected governor, Don Luis Munoz Marin, was to commission various studies of food distribution. The study of food retailing and wholesaling, which resulted in the book, Marketing Efficiency in Puerto Rico by Galbraith and Holton, has been mentioned. There were two related studies which proved to be quite important: Marketing Facilities for Farm and Related Products in San Juan, Puerto Rico, authored by Otten in conjunction with the Puerto Rican government, and the Comprehensive Agricultural Program for Puerto Rico by Nathan Koenig and various government officials. These studies are both basic documents along with the Marketing Efficiency Study. The interesting thing about these studies is that action was taken as a result of them. In addition they are available in libraries for study of how the recommendations were followed.

Certainly these studies were adapted by the decision makers. This is a tribute both to the comprehensiveness of the studies and to the government officials who were willing to take a risk and change the situation. After the three studies mentioned above were published, the governor appointed a Food Commission which was a brilliant political move. At about the same time, the governor publicly announced that food prices were too high, just as he had done in 1940.

In April, 1954, the Governor's Food Commission analyzed the Galbraith and Holton report and agreed with most of the suggestions made in that report as well as the basic ideas behind the study. The make-up of the commission was such that it brought the affected parties together. Some of those people who might have objected to reform were on the Food Commission and thus as parties to the commission report were publicly committed to support any government sponsored reform program which was based upon their recommendations.

Food Commission Recommendations

The Commission suggested the establishment of supermarkets in urban areas. There were those who really questioned this recommendation. Their objections

were that people buy food on credit. Consumers do not have cars. Consumers do not like to shop in large stores. They send their maids to the store shopping, and maids cannot shop in supermarkets. (In retrospect, Puerto Rico was ready for supermarkets).

Co-ops were recommended for rural areas, but have not been much of a force in urban areas like San Juan.

Government assistance in building and site selection was recommended to help local businessmen who wanted to establish new stores. The emphasis throughout this report was to help local Puerto Rican businessmen.

There was suggested a tax incentive for food processors.

Agricultural production was to be expanded and a stress was to be put on import substitution. (This suggestion was not as effectively implemented as the others. Puerto Rico still imports about 50 percent of its total food supply just as it did in 1950, however, there is more variety).

An intensive training program for food store employees was started by Fomento; later the Department of Commerce took over this function which in a modified form continues today. These and other recommendations were agreed upon by the Food Commission.

Government Efforts to Change Retailing

Fomento created a specific department to encourage food distribution improvements after the Food Commission made its report. Mr. Lee Feller was head of that department for a time in the mid-1950's. The Fomento group was involved in promotion, training, and loans as well as attempting to create voluntary chains. All of the efforts worked reasonably well, except for the creation of voluntary chains. Probably the most successful government-helped private enterprise development was the growth of privately owned supermarkets.

Fomento took the responsibility of encouraging supermarkets' development and in 1954 approached certain

San Juan food wholesalers about the possibility of establishing supermarkets. The government was willing to match private businessmen dollar for dollar in establishing their supermarkets. Certain wholesalers in Ponce, the second major city of Puerto Rico, were to participate in the establishment of these supermarkets. Of the San Juan retailers who were offered Fomento cooperation, only one retailer did cooperate but not in the way the government wanted. Thus, representatives of all segments of the food distribution system community were offered help. However, they did not accept the help at that time on the terms it was offered. Today there are some gentlemen who wish they had accepted the government offers. (There are also government officials who wish more effort had been put into these efforts to encourage local retailers to change their ways of doing business). In any case chain supermarkets are now very much in evidence and are charging lower prices than colmados for basic food items.

Another agency that has had much to say about changes in Puerto Rico is the "Junta de Planificacion"--or Planning Board. Planning Board approval is necessary before any construction can take place. The planning board has established specific requirements as to what type and what size stores shall be constructed in new housing developments. It has decreed that every new urbanization must have a shopping center. In addition, all building plans must be approved when stores are constructed outside shopping centers. There is the possibility, though, that the Planning Board store size requirements might harm more than help local Puerto Rican businessmen. Further, size regulations have sometimes been inappropriate resulting in clandestine merchants and large supermarkets bracketing the "approved" store size.

Puerto Rico has changed and will continue to change rapidly. The items that need to be carried in order to maintain a "profitable mix" are on the increase. Today, most supermarkets are selling basic commodities like rice, beans and bacalao (dried codfish) at or near cost. In order to make up for the losses on these goods, there must be widening assortment of other products which have a higher profit. According to some operators, this requires a minimum of 8,000 square feet of selling space or a minimum of \$750,000 to \$1,000,000 a year in sales to have a profitable supermarket. Yet, many stores in shopping centers contain only 3,000 to 7,000 square

feet as the Planning Board dictates. There are some alternatives which will be discussed.

Significant Retailing Changes

Harold Toppel, a continental, came here in December, 1955, and during the following spring started the Pueblo supermarkets. Harold Toppel opened his first store without initial financial assistance from Fomento, or any other government agency. It is interesting that this man who did not receive financial assistance when he first started, although it had been offered to others, today is the head of the largest retail food distribution organization in Puerto Rico. Even though Pueblo later obtained government loans, no one outside the company would have predicted its rapid growth in such a short time. There was, in fact, an inter-office memorandum that originated in Fomento during the late 1950's which discussed the possible growth of Pueblo. The brash writer predicted that Pueblo would have sales of \$48 million by 1965. The projection was rejected at that time by the writer's supervisors as impossible for any supermarket chain. Actual Pueblo sales surpassed this with over \$55 million sales last year. Credit must also go to Pueblo for the heavy reinvestment of most of their profits back into the Puerto Rican economy.

1956 saw a reorganization of consumer cooperatives with the help of Fomento and the Agricultural Extension Service. Cooperatives formed a new organization which established a full line warehouse. In 1958 Grand Union purchased Todas supermarkets at the request of certain government officials. Grand Union was supposed to provide effective competition for Pueblo. Todas was an operation of the International Basic Economy Corporation which had not been financially successful. Since 1958, retail food distribution has changed as a result of improvements and expansions of previous ideas. Chart 4.3 shows how the rate of corporation for supermarket sales change has been greater than the rate of total food consumption. Sales of the largest food chain had increased rapidly in Puerto Rico. However, Puerto Rican retail food sales of this food chain have begun to flatten out. There are private competitive forces

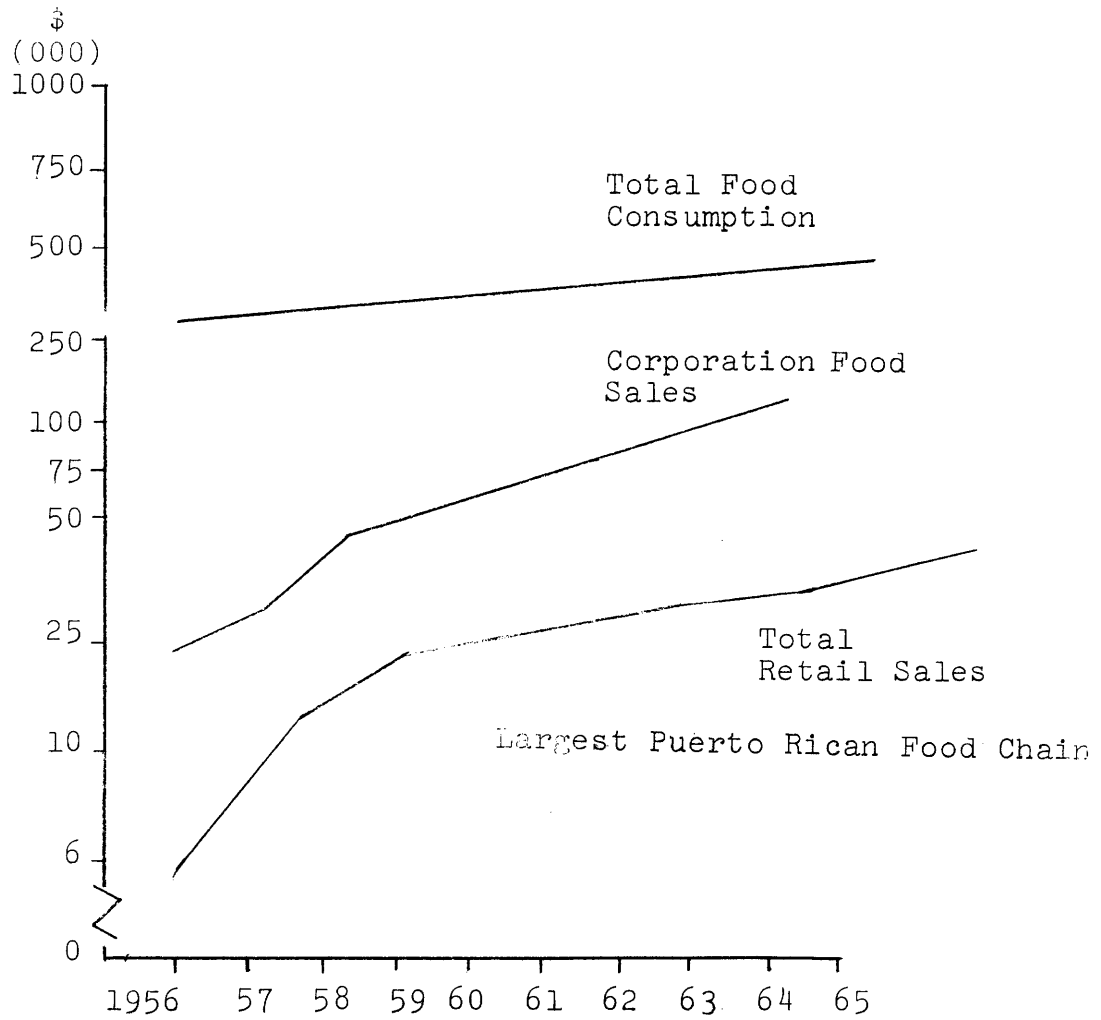


CHART 4.3

SHARES OF PUERTO RICAN FOOD CONSUMPTION

which are tending to hold down the growth of this company. One should not project any of these trend lines with any assurance. The rate of profits and the rate of sales growth of this largest company have helped foster counter forces from both government and some private business. The sales growth of this largest Puerto Rican retail food chain has enticed competitors into the field. One of those more recent competitors is growing rapidly at the present time.

One example of government response is that the Department of Commerce was specifically set up in the early 1960's to help small local businessmen more effectively compete with the corporations. The Department provides training programs and loans. In addition this Department and Fomento have sponsored studies of profitable investment opportunities in food distribution.

However, as was previously pointed out, the number of small stores in Puerto Rico has not increased much since 1950. Dr. Holton was worried about the employment effects of changes in food retailing in 1950. There have been employment effects because of the greater productivity of labor in supermarkets. The dollar sales per employee for supermarkets is about \$40,000, but the dollar sale in the small stores is less than \$5,000 per employee. What does that mean to employment? Suppose there were only supermarkets in Puerto Rico which all had the productivity of the present stores, then employment could be as low as 9,000 people in food distribution instead of over 40,000 that the 1963 Census of Business notes. The other extreme is what might be without supermarkets--then employment could be as high as 57,000 today. But, the small stores are not dead; the Department of Commerce, the beer and rum companies, and some private initiative are helping them survive. It was mentioned earlier that small stores are becoming beverage parlors today. A small survey of about forty small stores was conducted in May; a main finding was that the only thing increasing in sales in these small stores were beer and beverages. Food sales were not increasing in small stores. There is a place for these stores, though, because they are open longer hours. They do sell canned goods, rice, beans, and bacalao, but

at higher prices. The brilliance of certain government market regulations shows through (the government has said that all stores must abide by certain closing hours), except those stores that are operated by the owner. This leaves a place for the small stores. The large store must close every day at 6:00 except one day a week; on that day it is permitted to remain open until 9:00. The little stores are permitted to remain open any hours, seven days a week.

Now, though, the small stores find it more difficult to get credit from wholesalers. The small store finds it more difficult to get their customers to pay off their bills. (There seems to be some indication that when a consumer shifts from a small store to a supermarket he tends to forget about his bill at the small store where he has gotten credit). But the small retailer has found that his beer or rum distributors, each of whom has its own distribution system and company trucks, are willing to put in refrigerators and signs, and in addition are willing to give him beer and rum on a weekly supply basis. This has been a very convenient thing for the small retailers. Still there is a need to foster some type of convenience store that could be a bit more competitive with the supermarkets.

The Effects of Retailing Changes

According to the Galbraith and Holton study (which was disputed by some participants in the marketing system at the time), retail margins in 1950 were around 24 percent. According to the Department of Labor survey, which is done bi-annually to determine minimum wages, those retail margins are averaging about 18 percent as of 1964. Thus, gross margins appear to have fallen. Consumer incomes have increased as noted previously and a lower percentage is being spent on food.

Keys to Success in Retailing

Certain supermarkets were successful almost from the start. Effective management seems to have been critical. Successful operators have a novel blend of being sufficiently Puerto Rican, which means having a great faith in the people as customers and as

employees, and at the same time having guts enough to do something differently.

Variety in the stores has increased. Consumers are buying more meat, more milk and higher protein foods. Also, the best supermarkets in Puerto Rico have a better inventory turnover than many supermarkets in the United States. Direct shipment of mainland merchandise is another point that has made for rapid growth. The major supermarkets have 50 percent of their total floor space devoted to storage. One trailer load of merchandise, 40,000 pounds, is taken off the ship and frequently taken directly to the store and unloaded at the store. So local wholesalers are frequently bypassed and merchandise moves directly from mainland warehouses into the stores.

The option of mainland buying has been important. New York price lists have been available and when local importer or wholesaler prices were too high for quality and/or variety and dependability, as perceived by the management of supermarkets, the manager had the option of picking up the phone and placing the order in New York, Philadelphia or other United States ports. The direct shipment thus bypassed the wholesaler. Some supermarket operators are buying over 75 percent of their merchandise directly from the U. S. mainland. Operators did not have to worry about foreign exchange or balance of payment problems. Thus margins were lower. (One of the more traditional wholesalers mentioned that he was quite unhappy because his operations were compared to operations in another Spanish-speaking country where profits on sales were five times greater than his. In that other country the manager could get together with his associates and talk to the person who regulated imports of this particular group of commodities. In addition, he could discuss prices and business conditions with the competitors. My respondent implied it might have been that way in Puerto Rico several years ago but now it was very "nasty" because anybody could buy and could compete).

Another key to success in retailing is the number of suppliers serving retailers. Over the years this has dropped. According to our survey in 1965, the small retailers average six suppliers coming to their store, medium 25 and large stores 50 suppliers.

This is still more than would seem reasonable, but it is less than the average in 1950.

The lack of consumer credit and pilferage have not proved to be serious barriers to supermarket growth. (There are certain managements today in food distribution firms who believe that customer pilferage is a great problem and thus might tend to hold back on investment. Yet, there are others who believe that pilferage here is less of a problem than is on the mainland and they feel that what some people call pilferage is really a problem of internal control in terms of mis-marking and of other internal problems in store operations. Thus, there is a great difference of opinion about this "pilferage problem").

Wholesale System

Presented and Summarized by John R. Wish

Introduction

As mentioned previously, some supermarkets have found it advantageous to import directly the majority of their purchases. Smaller colmados on the other hand are buying from many of the same suppliers that have always supplied them.

The 1956 introduction of the full line warehouse by the co-op, and the Department of Commerce effort to help some retailers establish their own warehouse as "comerciantes unidos: in the early sixties, were two major attempts to change wholesaling.

In 1963 the Central Market was established in San Juan. It was a modification of one that was first recommended in 1950. One of the main purposes of the Central Market was to help the food wholesalers relocate out of the crowded downtown streets of old San Juan. The idea was to move out of the multi-story 18th and 19th century buildings in order to:
1. Increase handling efficiencies and; 2. Provide an easier route to urban renewal of old San Juan. In 1963 Dr. Lastra, then Secretary of Commerce, established the CDC (Commercial Development Corporation). CDC made the development of the Central Market a reality. It has plenty of dock space for the trailer ships, and modern, one story warehouses for handling food products. Space was rented in that facility to various private businessmen at a sliding scale beginning at 90 cents per square foot per year.

The Present and Future

The above changes of the last 15 years were really laying the groundwork for what might be. Frankly, wholesaling methods have just not changed that much in the last 15 years.

The traditional importer-wholesaler has limited line. There are still many of them located in old San Juan, although some have moved to the new facilities mentioned above. Since the limited line

wholesaler predominates, a retailer must have several suppliers. Yet, a consultant found that one of the limited line wholesalers was losing money because of the small size of an average order. At the present time most of these limited line wholesalers have salesmen calling on the stores as they did fifteen years ago, and taking orders for his individual, limited line merchandise.

It is to the credit of the government that it has fostered and encouraged, through training programs, investments and loans, the full line warehouse here in Puerto Rico as was suggested by various studies during the fifties. However, full line wholesalers have not yet caught on. There are in San Juan only three significant full line wholesalers which, as of 1965, sold only 8 percent of the food going through wholesalers.

There seem to be three primary reasons for this. The limited line wholesaler, because he has a contract with a manufacturer, is sometimes the only person who can buy merchandise from that manufacturer. A warehouse then must buy through this limited line wholesaler who may also be competing with the full line warehouse. Secondly, there is a direct import option for the large stores. We asked the question "Do you have access to buying prices on the mainland?" Almost all of the large stores did. In addition, all of the large stores bought at least some of their merchandise direct from the mainland.

There is some indication among smaller operators that the retailer likes to think of himself as a shrewd buyer. In many instances the interaction between these salesmen coming in, treating him like a real man and one that he has known for years, is something that the retailer likes. He feels he can manipulate the salesman and make wise purchases.

An announcement was made the latter part of May concerning the new Pueblo warehouse. This warehouse will cost something over \$4 million and have over 200,000 square feet. Thus, a new full line warehouse is to be established. The warehouse should lower Pueblo costs significantly. When this

happens, other retailers and wholesalers could find themselves in a significantly different position.

The plaza de mercado which has figured importantly in government plans and which figures importantly in many Latin American countries, is of declining importance in Puerto Rico. The Plaza today is an important place for wholesaling fruits and vegetables, but lacks grading, sorting and price information. A survey found that on a given day at three different markets, one each in Santurce, Rio Piedras and Mayaguez, there were frequently wide variations in prices on a number of specific commodities. There was lack of information. Because of uncertainties, many supermarket buyers would prefer to go to the mainland to buy produce because they know the price level and the quality.

Conclusions

A high level concern for the "high price of food" was evidenced by Don Luis Munoz Marin, the leader of the victorious political party of Puerto Rico, as far back as 1940. When this dynamic man became governor in 1948, his reformist government requested several studies of food distribution. Out of these studies came unanimous recommendations which were argued over by parties of interest on the governor's appointed Food Commission.

Fomento, which was primarily responsible for industrial development, set up a department for fostering food retailing changes. However, the greatest success story in retailing was produced by an outsider who at first received no financial help. As this gentleman and other retailers became established, they found it advantageous to buy some products directly from suppliers on the U. S. mainland. They were able to bypass local wholesalers.

There have been few changes in wholesaling, other than the establishment of the excellent Central Market. Further changes appear to be in the immediate future as the result of recently announced plans for a warehouse to be built by Pueblo. From this new venture one would expect more intense competition at the wholesale level.

Puerto Rico has a history of government and business working together closely. For instance, the "hours law" which permits owner operated stores to operate at whatever hours they wish, gives the small businessman a time competitive advantage. On the other hand, the Planning Board regulation on store size in new urbanizations will need close scrutiny as Puerto Rico continues to change. In addition, the limited line wholesaler may present some legal complications to the process of rapid change.

Regulatory Environment of Food Marketing Channels in Puerto Rico

Presented and Summarized by Charles C. Slater

The business law or regulator environment of Puerto Rico provides some instructive insights into marketing development problems. The new Puerto Rican anti-trust laws are starting to be applied, but they are not as yet a force in the market place. However, Puerto Rico's unique broker law is a special law of vested interest that may deserve some reconsideration. In substance, the law provides that a principal may not change his agent without giving the agent a share of rewards for the future revenue that would have accrued to the agent as a result of prior work benefiting the principal. Perhaps because the law has not really been tested yet, it stands as a structural constraint which may prevent certain reforms in the marketing processes. Another unusual legal situation is precipitated by the commonwealth status of Puerto Rico. At present, there is an opportunity to buy either from the local wholesale distributor located on the island or to buy from the mainland. Sometimes this results in differences in mainland prices (plus freight) as opposed to local prices which are set by an importer who assumes title to the goods.

Another business regulation that seems to be very important is the co-op law which essentially favors the producer or the consumer but not the businessmen in the middle. Consumer cooperatives can be formed by twelve or more consumers just as producers can form farm cooperatives. The dilemma, however, is that retailers cannot form cooperatives, such as the Associated Grocer Group, or the Certified Grocer Group in the United States. These cooperative arrangements permit retailers to own their own warehouse as a joint venture. Retail cooperatives have been one of the most dynamic forces in the United States food distribution system. The question is, should the present consumers' cooperative also try to be the cooperative for retailers? Can the same institution serve both consumer and retailer?

The wholesale market is a critical turn point for the whole structure of the market. It represents a large aggregation of capital that is still very strongly

consumer-oriented through the retailers. In the case of a retail-owned cooperative the wholesale market would be the retailer's representative as a buyer. This kind of mixing warehouse operation, or full-line warehouse, has a very important role in many market structures, both in the United States and in Europe.

In the past, Puerto Rican retailers were denied freedom in buying because of credit ties to the older, limited-line wholesalers. There are ways around vestiges of this type by collecting sufficient capital to consolidate the retailer's present multiple debts to many small wholesalers. This kind of financial plan has worked out rather well if the program of the wholesale operation attempts to help the retailers better satisfy the final buyer, rather than merely overloading the retailer. This overloading sometimes occurs with limited-line wholesalers who try to get as much display space as they can in competition with other wholesalers.

Puerto Rico faces an agonizing test of the structure of present co-op federation. If one looks at this in a historical context, it was a sufficiently difficult task to get the basic cooperative federation going. A somewhat different environment has now presented itself in which a voluntary arrangement of retailers might be suggested as a result of the nature of retail competition that is emerging.

CHAPTER 5

AGRICULTURAL PRODUCTION AND MARKETING SYSTEM

The Changing System of Agricultural Production and Marketing

Presented and Summarized by Harold M. Riley

Introduction

The purpose of this chapter is to provide a brief overall view of Puerto Rican agriculture and to describe in some detail the changes in the production and marketing of three major commodities: milk, eggs, and fruits and vegetables. Institutional reforms have contributed to significant improvements in the coordination of production and marketing of milk and eggs. Similar improvements are yet to be realized in the marketing of most fruits and vegetables.

Puerto Rican Agriculture

Three major crops—sugar, coffee and tobacco—make up about one-half of the total agricultural output with sugar alone providing 36 percent of the total (See Table 5.1). Animal products are 36 percent of total output with milk being most important within the product group.

Sugar is a dominant agricultural industry operating under the quota system of the United States Sugar Act. The best lands of the coastal plains are devoted to sugar production. Most of the sugar is exported to the United States mainland in exchange for other food commodities, including grain, meat, dairy and poultry products, fats and oils and fruits and vegetables.

There have been significant changes in the pattern of agricultural output over the past several years, (See Table 5.2). There have been moderate

TABLE 5.1

Composition of Agricultural Output, Puerto Rico
1963-1964

Product	Percent of Total Output
Sugar	36
Coffee	7
Tobacco	5
Fruits and Vegetables	13
Milk	20
Poultry and Eggs	8
Beef and Pork	8
Other	<u>3</u>
TOTAL	100

Source: Office of Agricultural Statistics, Department of Agriculture, Commonwealth of Puerto Rico.

TABLE 5.2

Percentage Change in Output of Selected Agricultural Products, Puerto Rico, 1951 to 1963

Product	Percent change in Output
Sugar	-4
Starchy vegetables	-12
Fruits	+20
Other vegetables	+52
Animal products	<u>+101</u>
Total agricultural output	+30

Source: Office of Agricultural Statistics, Department of Agriculture, Commonwealth of Puerto Rico.

declines in the production of sugar and starchy vegetables. Substantial increases in output have been realized in milk, eggs, poultry, and selected fruits and vegetables. On the price weighted basis, aggregate agricultural output increased 30 percent between 1951 and 1963.

According to the 1959 Census of Agriculture there is very unequal distribution of land among farms (See Table 5.3). Sixty-nine percent of the farms had annual sales of farm products of less than \$500. Sixteen percent were classified as subsistence farms. At the time of the Census, 20 percent of the persons living on farms were unemployed. These data indicate that low levels of income, unemployment and minifundia conditions are still serious problems in the rural areas of Puerto Rico.

Efforts to Change Agricultural Production and Marketing

The United States Department of Agriculture-Land Grant College system operates in Puerto Rico much as it does on the mainland. This has been a major factor in bringing about changes in agricultural production and marketing.

There have been several special task force studies on agricultural production marketing problems. Two studies in particular, however, merit special mention. The first was a 1950 study headed by Caleb Otten, Marketing Facilities for Farm and Related Products at San Juan, Puerto Rico, published as U. S. Department of Agriculture Information Bulletin No. 60. This study pointed up the need for a central wholesale food marketing facility in San Juan, improved grain handling port facilities and a meat plant. The second study by Nathan Koenig resulted in "A Comprehensive Agricultural Program for Puerto Rico." This was a thorough description of the agricultural industry with specific recommendations for improvements. A section of the report was devoted to marketing of agricultural products. It appears that both reports had significant influences on subsequent agricultural programs.

During the late 1950's efforts were initiated to bring about greater coordination of the activities of the various agricultural agencies. An Agricultural Council was established to facilitate coordination.

TABLE 5.3

Percentage of Farms of Specified Sizes and Percentage
of Land Area in Farms by Size Groups, 1959

Size of farm in cuerdas <u>/a</u>	Percent of farm units	Percent of land area in farms
3 - 9	50	7
10 - 49	38	22
50 - 99	6	10
100 or more	<u>6</u>	<u>61</u>
TOTAL	100	100

/a one cuerda = .97 acres

Source: Census of Agriculture, 1959, Bureau of Census.

This has led to an attempt to devise and carry out a rationalized development plan for agriculture. The island has been divided into five regions. Specific development plans are being worked out for each region with attention to both market opportunities and production possibilities. Some of the specific activities under this program are described later in this report.

The Approach for This Study

In this study we have attempted to view the agricultural production and marketing system as a set of vertically related, interdependent activities which relate consumers, retailers, wholesalers, processors, assemblers and farmers. The production and sale of agricultural inputs should also be considered a part of this overall system.

The study has focused on the vertical coordination of production-marketing systems for milk, eggs and fruits and vegetables. The objectives have been to examine the conditions which have fostered and/or retarded effective market organization. This will enable us to assess the transferability of successful

institutional arrangements to other Latin American communities and to identify ways of making further improvements in the Puerto Rican production-marketing systems.

Vertical Coordination in Selected Product Markets 1950-1965

Presented and Summarized by Kelly M. Harrison

Introduction

The following discussion is concerned with market coordination in Puerto Rico. Before proceeding, however, the meaning of that term should be made more explicit. Market Coordination may be defined as the complex and dynamic process by which producers, distributors, and consumers interact: (1) to exchange relevant market information, (2) to establish conditions of exchange, and (3) to accomplish physical and legal exchange of the economic goods in question. Alternatively we might choose to think of market coordination as the process of matching supply with demand in a dynamic economy.

All market systems are coordinated--some more effectively than others. Marketing costs in developing economies are often quite high as a result of poor coordination. Ineffective market coordination and resulting high costs may be characterized by (1) ineffective market communication, (2) wide price fluctuations, (3) unstable supply conditions, (4) a high degree of waste and spoilage, and (5) excessive handling.

There are at least three ways in which more effective market coordination for food products may bolster the growing economy: (1) by reducing food costs to consumers; (2) by increasing profits to efficient distributors who may then re-invest in cost reducing innovations; and (3) by bolstering farm profits which can be invested in new, more efficient production techniques.

In the following section the recent developments in the production and marketing of three food commodities in Puerto Rico will be summarized. The commodities are milk, eggs, and fruits and vegetables. The discussion is designed to illustrate (1) the meaning of market coordination, (2) the methods of market coordination, and (3) the merits of market coordination.

Production and Marketing Conditions 1950-1957

Perhaps the best term for describing the 1950 production structure for milk, eggs, and fruits and vegetables is atomistic competition. The bulk of production for all three commodities was accomplished on a very large number of extremely small farm units. In most cases, these were subsistence-type farms where a wide variety of commodities were produced primarily for on-farm consumption, with excess supplies being exchanged for cash in the market. In the case of eggs, 88 percent of all farms in Puerto Rico had hens for egg production. A similar situation existed for production of milk and of fruits and vegetables. These numerous small producers operated with a very low degree of market intelligence or technical production knowledge. This lack of information regarding production and marketing alternatives tended to keep production and sales costs high. It also contributed to a high degree of risk and uncertainty.

Partly as a result of the above situation, imports provided a significant proportion of the total supply for the island. In 1950, imports accounted for 38 percent of the total supply of eggs about 48 percent of the total supply of fruits and vegetables. Although, due to its perishability, very little fresh milk was imported, large quantities of canned and powdered milk were brought into Puerto Rico and served as substitutes for whole milk produced on the island. Obviously it was difficult for the small unorganized Puerto Rican producers to cope with the competition from the well-coordinated import market.

This brings up a third major production and distribution condition of these three commodities. Poor market coordination and handling methods prevailed. The lack of production and market information has already been cited as a factor in these industries. Its main effect was to lower the coordination of the system. That is, it prevented the producer from finding out when, where, what, and how much was desired by consumers. This general lack of knowledge by producers and middlemen also resulted in the use of handling methods that were often inefficient, unsanitary and wasteful.

Production and Distribution Development, 1957-1965

Rapidly rising incomes since 1950, noted earlier in this publication have had a significant impact on consumer demand. Charts 5.1 and 5.2 show the trends in per capita consumption of milk and of eggs, respectively. In both cases it can be seen that consumption has expanded rapidly since 1950. Per capita consumption figures are not available for fruits and vegetables as a group but indications are that per capita consumption of certain starchy products has declined and per capita consumption of the green and leafy vegetables and certain fruits have increased. The most significant fact is that per capita consumption is either stable or declining for those fruits and vegetables traditionally supplied by local producers and rising for those products that are most frequently imported.

The rapidly rising demand for milk and eggs has been met largely by local producers. Certain basic technological changes have been made by a large number of producers of those two commodities in order to meet the market demand. There is very little indication that such changes have taken place to any great extent among fruit and vegetable producers. There are isolated examples of adoption of technological innovations in the production of a few products, but these generally apply only to one or a few producers of a specific commodity.

Examples of the kinds of development which have permitted expansion of egg production in Puerto Rico are the extended use of commercially mixed feed rations, larger production units, greater use of medicines, improved housing facilities and in general better management.

Dairymen in Puerto Rico have generally been the most progressive of all farmers on the island. Since 1950 they too have rapidly expanded their use of mixed feed rations and medicines. The Department of Agriculture has received excellent cooperation in eradicating or controlling a number of diseases and insect pests in the past fifteen years. Milk producers have widely adopted mechanical milkers, bulk tank storage, and artificial insemination. Milk pasteurization has become much more prevalent

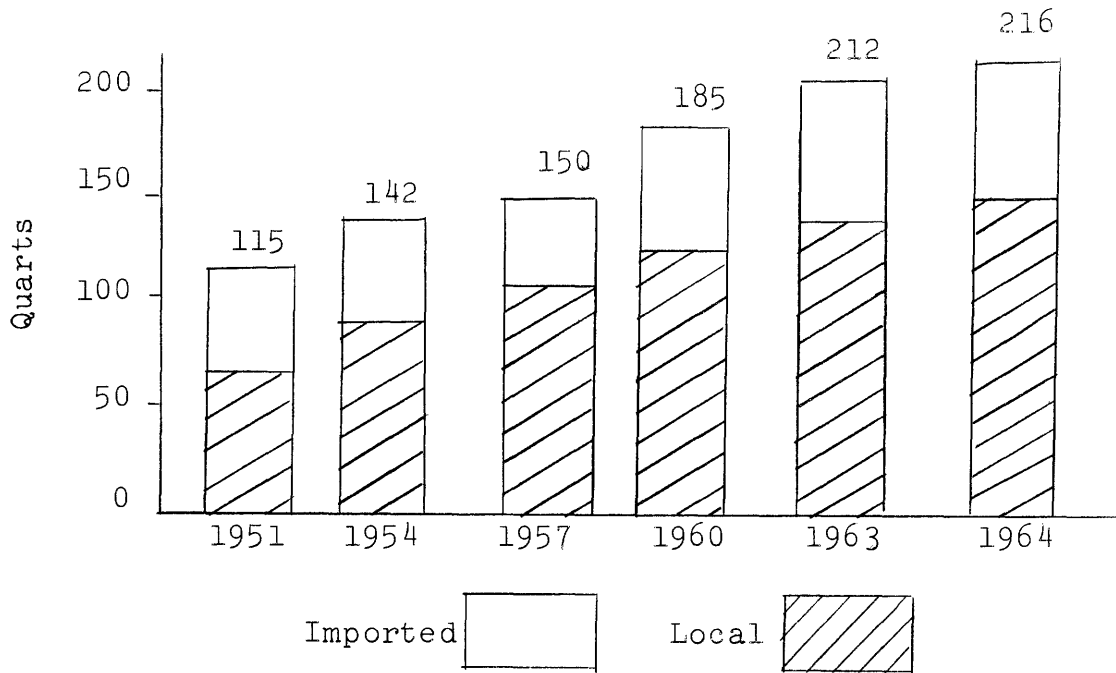


CHART 5.1
Per Capita Milk Consumption in Puerto Rico
Selected Years 1951-1964

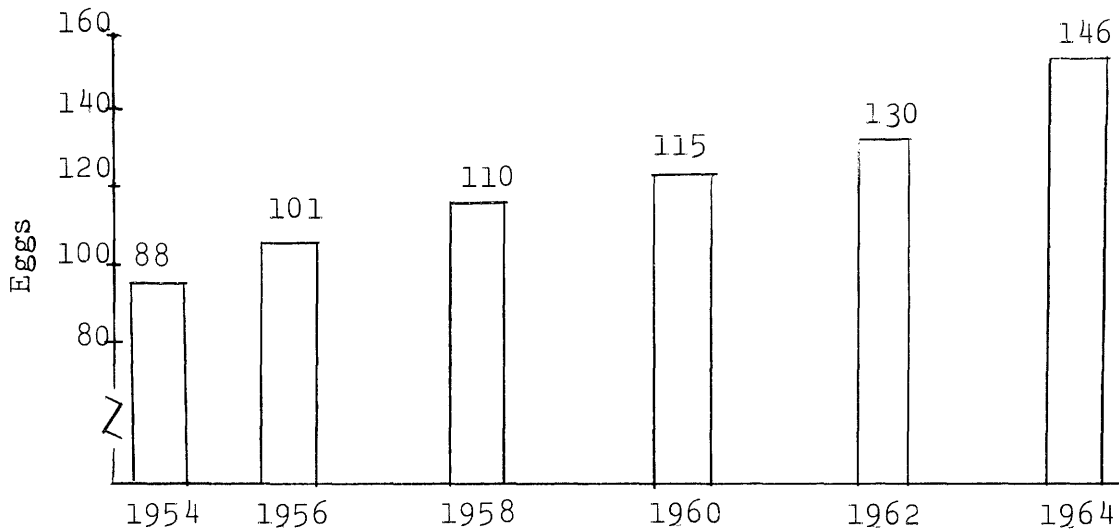


CHART 5.2
Per Capita Egg Consumption in Puerto Rico
Selected Years 1954-1964

Source: Puerto Rico Department of Agriculture, Division of Agricultural Statistics.

since 1950 when about 60 percent of all milk was consumed raw. The number of Class I dairies is shown for various years in Table 5.4

TABLE 5.4

Number of Class I Dairies in Puerto Rico
In Selected Years

Years	Number of Class I Dairies
1951-1952	298
1957-1958	465
1961-1962	639
1964-1965	747

Class I producers are those dairymen who have met all the requirements deemed necessary by the Department of Health for obtaining a license to sell to pasteurizing plants. Class II producers are those who meet less stringent health requirements; these producers are permitted under certain circumstances to sell raw milk directly to consumers or to dairy food manufacturing plants. The figures in Table 5.4 illustrate the rapid shift toward Class I production in the past fifteen years as consumers have demanded better sanitation and pasteurization.

The following discussion summarizes specific changes in market coordination for the individual commodities.

Market Coordination Development and Their Effects

Eggs. The rapid expansion of supermarkets in Puerto Rico since 1956 has had a significant impact on production and distribution of all food products. The special needs of such large scale retailing operations are such that a greater degree of coordination is required. The effect has been particularly evident in egg production and distribution. It is

a virtual necessity that modern supermarkets have eggs that have been cleaned, graded and packed in consumer-sized cartons. It is also important that supermarkets have a steady supply throughout the year. Such retail organizations tend to seek out and encourage those producers who can meet these requirements in large quantities. Transaction and exchange costs of supermarkets can be reduced by dealing with fewer and fewer suppliers.

Certain government regulations can be helpful in establishing rules of exchange, grading and handling. Puerto Rican producers have been benefited by three recent egg marketing regulations. The first was passed in 1956 and established egg grading standards. The second came in 1958 and provided a set of rules for labeling, transporting, and handling eggs. Finally, in 1964 a regulation was approved requiring the labeling of eggs to identify their place of origin, i.e., "del pais," United States or foreign import.

Supermarket requirements for large quantities of cleaned, graded, and packaged eggs have encouraged the development of several types of coordinated producer-distributors. The most common have been integrated individual producers, i.e., individual producers who can achieve sufficient size to make grading, packaging, and distribution feasible. Cooperatives are a second way by which individual producers have achieved market coordination. Through cooperatives small producers can pool their production in order to have sufficient volume for grading and packing. They may also share the cost of collecting market information and in general make coordination with buyers simpler. A third approach in Puerto Rico has been the non-profit corporation. The purposes and advantages of these associations are basically the same as those listed above for cooperatives. They are mentioned and discussed at some length below because of the unique conditions which preceded the organization of the first such association and because they may hold some promise as coordinative institutions in developing nations.

The Lajas Valley Egg Producers Association was the first of three such non-profit corporations to be organized. It grew out of a plan by the Lajas

Valley Development Office to encourage egg production in the Lajas Valley. That office hired a full time individual and gave him the responsibility of interesting farmers in egg production and then helping them to obtain loans and start production. He was fairly successful and soon had several farmers producing and marketing eggs in Lajas and surrounding towns. As these commercial producers gradually expanded their flocks, they experienced greater difficulties in finding market outlets. The government worker began to consider a marketing cooperative. At that time the owner of the largest supermarket chain on the island made a \$5,000 grant available to the experiment station for the purpose of encouraging agricultural production. The Lajas Valley Development Office requested that the money be loaned to local egg producers for the purpose of organizing an egg marketing cooperative and buying necessary grading equipment. The request was granted and Pueblo Supermarkets agreed to purchase eggs from the association to be marketed under Pueblo's own label. At this point two other government agencies stepped in to provide assistance. Fomento provided a building, rent free for six months, and the agricultural extension service provided management training and guidance to the members. The association has been quite successful. Production has almost doubled in two years of operation. Through the association, producers have achieved a degree of market coordination they could not attain alone. Moreover, production costs have been reduced by purchasing supplies as a group. Average flock size per member increased from 2,000 birds in 1963 to 2,857 birds in 1965. The unique feature of this association is the degree of cooperation which occurred between the farmers, the Lajas Valley Development Office, the Extension Service, Pueblo Supermarkets, and Fomento. Each played a vital role in this market coordination effort.

Milk. The importance of government market regulations was mentioned with relation to eggs. A different kind of market regulation has had tremendous impact on milk production and distribution in Puerto Rico. Prior to 1957 milk producers were perfectly free to produce and sell milk as they pleased within certain sanitary regulations. Production of a perishable commodity with seasonal production peaks led to a great deal of instability in the industry.

In the flush season, producers often found themselves facing very low prices or with no market at all for their product. On the other hand, in the slack season, processors and distributors were often obliged to pay extremely high prices for their milk supplies. This situation led to unethical and often destructive competitive practices and generated a great deal of animosity between producers and processors.

In 1956, a representative group of dairymen, processors and distributors petitioned the government for a legislative hearing on competitive conditions in the industry. After hearing almost unanimous agreement among producers, distributors, and processors regarding the need for regulations, the legislature passed an enabling law in 1956. The law created and gave regulatory power to the Office of Milk Regulation which was instructed to prepare a specific market regulation.

The Milk Regulation had four major provisions and is applied only to Class I producers and milk pasteurizing plants. It provided for: (1) the establishment of a minimum farm price and maximum prices at all other levels of distribution; (2) a classified pricing plan whereby a producer would receive an equitable price for all his milk regardless of its final use; (3) a milk promotion fund supported by the mandatory contributions of producers and processors; and (4) certain specific regulations governing producer, processor and distributor relationships.

There is little doubt in the industry today that the regulation has given stability to producer-processor relationships and contributed to orderly and rapid expansion in the industry. The guaranteed price and stable processor agreements have been instrumental in encouraging sugar cane producers to switch crop land to pasture for milk production. Finally, consumers have benefited by receiving adequate supplies of fresh milk at prices reflecting the narrow margins granted to producers, processors and distributors.

Fruits and Vegetables. The two commodities discussed previously provide good examples of various market coordination alternatives in the face of

rapidly changing demand and distribution patterns. The fruit and vegetable industry in Puerto Rico, by and large, has not had the same success. The production and distribution system today is basically the same as it was in 1950. The bulk of the production still comes from large numbers of small ill-informed producers who insist on clinging to traditional crops rather than shifting to products with greater consumer demand. Market coordination is largely left to merchant truckers who make purchases at the farm, transport the product to a market plaza, and peddle the produce in relatively small lots to retailers in the plaza or to store owners who come to the plaza for supplies. There is little grading, washing, or packaging and poor handling methods prevail. Purchases are made only on the basis of personal inspection. The main difficulty with such a system is that it makes transaction costs high and fosters uncertainties for all people in the system. As a result producers do not receive the information indicating what consumers and retailers really want.

Such ineffective market coordination by local producers in the face of rapid changes in food retailing have caused supermarkets and other large retailers to look elsewhere for stable supplies of many fruits and vegetables. A lack of processing facilities has also hampered local producers. Chart 5.3 shows total wholesale value of fruit and vegetables divided between imports and local production. It shows that even though sales of local production have increased substantially since 1950, local production as a percent of total sales has declined by 10 percent.

In spite of the fact that fruit and vegetable producers in general have been slow in making market coordination improvements, there are certain isolated examples indicating some progress in coordination arrangements. One of the more successful of these is a banana marketing cooperative which assembles, ripens, packages and distributes for its members. An orange association (organized along the same lines as the Lajas Valley Egg Producers Association) is now purchasing and processing oranges and exporting juice to the States. It plans in the near future to begin sorting out the higher quality oranges for

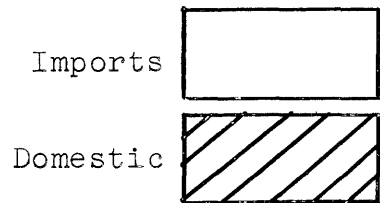
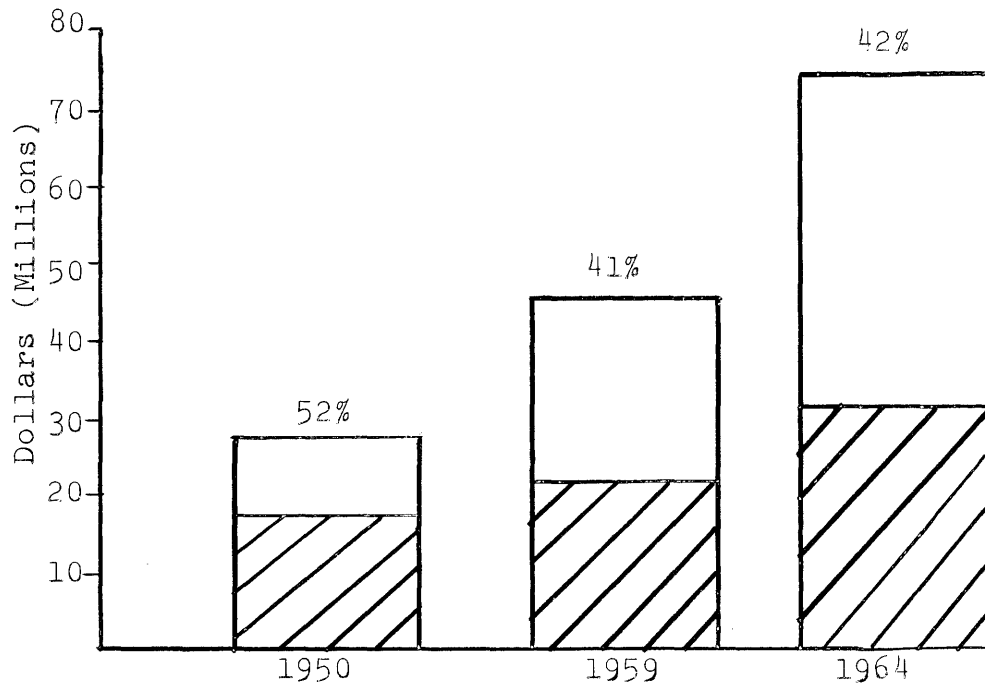


CHART 5.3

Wholesale Values of
Fruits and Vegetables,
Imported and Domestic,
for Puerto Rico Selected
Years.

fresh market sales. A private processing firm is contracting with farmers for the production of tomatoes which are used largely for canning, and, recently, quality tomatoes for fresh market distribution. In addition, a few wholesalers have established direct relations with producers for the purpose of obtaining stable supplies of consistent quality produce. Most supermarket chains in Puerto Rico now have their own local buyers who deal directly with farmers and wholesalers in order to stabilize relations, lower costs, improve product quality, and in general expand local supplies of fresh produce. The success of these isolated efforts indicate the need for more effective coordination between producers, processors and distributors of fruits and vegetables in Puerto Rico.

Summary

The Puerto Rican economy has undergone rapid changes in the past fifteen years. These changes have had a significant impact on production and distribution of food products in Puerto Rico. They have also pointed up the need for effective communication and coordination between producers, processors, distributors and consumers. A basic prerequisite for an efficient food supply system is adequate participant knowledge regarding current market situations as well as technical knowledge about his own business. The latter kind of knowledge is a function of several things including education, practical experience, and willingness to learn; but the former is largely a function of the individual's willingness and ability to discover the proper sources and proceed to gather the relevant information. Sometimes this search operation is more effectively done through a group and in other cases institutional arrangements can alleviate the need for detailed information. We have shown that some Puerto Rican producers have proceeded to obtain the information necessary for more effective coordination in egg markets through cooperative organization, as well as through individual action. We have noted the coordination of milk markets in Puerto Rico through government regulations. Finally we have observed the relative lack of information and

coordination in the fruit and vegetable markets and the resulting stagnation, except in isolated cases, of production and distribution of these commodities. Hence we conclude that individual attitudes, institutional arrangements and government regulation have played a vital role in improving the coordination and economic performance of the food production and marketing system during the past fifteen years of rapid economic development in Puerto Rico.

CHAPTER 6

ATTITUDES AND COMMUNICATION BEHAVIOR

Attitudes and Communication Behavior: An Overview

Presented and Summarized by John R. Wish

Introduction

This section has 3 parts: (1) the central argument with respect to attitudes; (2) other studies which support the argument on attitudes; and (3) some general summary comments.

Before continuing with the above mentioned subjects, it is necessary to point out the definitions of attitudes and communications that will be used in the following. Attitudes are predispositions for action. Communications are the ways and the frequency that various bits of information pass between and among people.

The Central Argument

The first part of the argument pertains to attitudes. In general, food marketers or for that matter businessmen operate within a specific environment where the society provides rules, regulations, social mores and roles. These rules, regulations, social mores and roles which change over time influence what is done and what is thought possible in that business system. A second factor in the argument is that changes in market institutions are often a necessary but not sufficient condition for rapid economic growth. Changes in market institutions seem to depend upon changes in the attitude of the participants who are already in the socio-economic system, or upon new participants with different attitudes.

A pertinent question is how do these changes occur? It is assumed that most of the changes are

made by the people rather than just happening. More specifically, it is hypothesized that in Puerto Rico some individuals made the changes occur. The surveys are now being analyzed in order to determine, among other things, who are the people who make the change. On the basis of our interviews, there will be better indications of those who bring about the change.

Previous Findings

Illustrative of previous findings are the similar conclusions of two anthropologists, Banfield and Tax, writing different books in different parts of the world. First of all, they both felt that economic development is impossible if pervasive distrust and unwillingness to cooperate exist. In southern Italy, Banfield found that very poor people saw the world as what the mathematicians call a zero sum game. It was a world of given endowment in which one person must lose when another benefits. In sharp contrast, the majority of Puerto Ricans see the world in terms of a positive sum game; both parties must benefit in an exchange. The world view is that persons believe that increasing goods are available, and when one person gains, others will too.

Secondly, Banfield and Tax both find that atomistic competition may be a negative force in development. Thus, numbers of firms or concentration ratios do not seem as important as some other variables. According to this view then, there is bad or good in the growing size of food retailing establishments and the corresponding decrease in number. (Apparently the economies of scale are such that we believe larger stores perform at lower costs).

Everett Hagen, an economist, and Eric Hoffer, the longshoreman philosopher, both suggest that a person who is well accepted and secure is the least likely to change. Yet, some development programs have depended upon the cooperation of those persons who are well accepted and secure in their business

or in their relative position in society.

Katona, in his research at the Survey Research Center at the University of Michigan, has found that people are, at one and the same time, both creatures of habit and that they are rational. Dr. Rogers has found in his studies of diffusion and innovation, in both the United States and elsewhere, that innovators (those persons who are among the first to try to adopt new ideas in their business or in their firm) have what are called modern world views and value education.

Such literature suggests that there are some important attitudes which are precursors of development and change. We believe that attitudes such as world view, attitude toward education, trust in others, trust in government, cooperativeness, hoarding versus a tendency not to hoard, attitudes toward new institutions and attitudes toward business practices are important preconditions in economic development. An attempt was made to get at each of these in the Puerto Rican survey.

Conclusion

Today, we are in the exploratory phase. Although a well-developed theory does not yet exist, we are going beyond a static model. Through a systems approach, we are examining a process, not looking for an equilibrium state. Finally, we think that attitudes and economic factors are interrelated.

Attitudes, Preliminary Results

Presented and Summarized by Kelly Harrison

Introduction

The basic rationale for studying attitude variables in a marketing research project has been previously reviewed. This section will summarize some of the preliminary results of the attitude phase of the research in Puerto Rico.

The discussion will draw on the data collected in six separate surveys administered in Puerto Rico between November, 1965, and March, 1966. Table 6.1 shows the six survey groups and the sample size divided between San Juan and Mayaguez. Only farmers within the Mayaguez agricultural region were sampled. Food manufacturers from all over the island were included in the processor sample. Unfortunately, the sample size of processors is too low to permit extensive statistical analysis.

The questionnaires administered to the different groups were quite similar in most respects. Each contained four different sections. One section solicited information on the business operation, farm unit or consuming unit in addition to relevant market channel information. A second section tapped a series of demographic variables such as age, education, and family income. A third section dealt with the communication habits of the individual; the fourth contained questions designed to indicate attitudes toward modernization and change, marketing practices, market institutions and government. The following discussion summarizes some of the results obtained in the attitude section from the six survey groups. It should be noted that in the case of wholesalers and retailers the population was stratified on the basis of total yearly sales of the firms and a disproportionate random sample was taken. That is, the percentage of large firms sampled was higher than the percentage of small firms sampled. A somewhat similar situation exists in the farmer sample. In this case the population of food producers in the Mayaguez region was divided

between all farmers who were members of one or more associations and those who was not members. A higher percentage of members were included in the sample.

TABLE 6.1

Survey Groups and Size of Sample
in Each City or Region

Survey Group	City and Sample Size	
	San Juan	Mayaguez
Farmer	-	172
Trucker	40	25
Processor		32
Wholesaler	46	18
Retailer	89	51
Consumer	246	141

The frequencies and percentages summarized in this section, however, have been appropriately weighted to correct for the disproportionate samples. The figures reported herein can therefore, with the usual statistical limitations, be generalized to the populations from which the various samples were drawn.

Preliminary Attitude Results

One factor which has been accorded a great deal of attention by development economists has been the degree to which people in developing economies are willing to save. We included in our farmer, trucker and consumer surveys a question designed to yield an indication of the individual's attitude or predisposition toward saving, consuming and investing. We asked each person to assume he had been given \$500. He was asked to tell us how much he would spend on each of several alternatives. We compiled the information for the three surveys and computed the average amount of money out of each additional dollar which

each group would spend for the various reasons.

We found that generally there was little inclination to hoard money by putting it in a safe place. One of the items with a larger response was "put it in a savings account." The range among the various groups was from 13 cents to 27 cents out of each additional dollar. That is surprisingly high when compared to aggregate data which indicate dissaving in Puerto Rico. Other important items were "spend on necessities," ranging from 13 cents to 28 cents per dollar; "invest in a business," ranging from 4 cents (for consumers in San Juan) to 44 cents (for farmers); and "education for the family," ranging from 12 cents to 19 cents. While this method has definite limitations, it represents one way of obtaining estimates of the ways in which consumers in developing economies are likely to spend additional income.

Another important factor, indicating both capacity and desire for improvement in developing nations, is the level of educational achievement motivation. We asked each respondent on all surveys what level of education he desired for his oldest son. Or if he had no son what level would he desire if he did have one. Then we asked whether he thought that level of education would be possible. A relatively high percentage of the respondents on all surveys indicated a desire for at least one year of college for their sons. Moreover, they generally indicated a belief that it would somehow be possible. Hence, educational aspirations are quite high in Puerto Rico.

To obtain information on attitudes toward a variety of items, we presented to each respondent a series of statements. We asked them to indicate their agreement or disagreement with the statement on a five point scale. The answer could be complete disagreement, disagreement, indifferent, agreement or complete agreement.

The first series of attitude statements dealt with basic world views. It included such statements as: "Children should be instructed to follow the ways of the past to the letter," and "We would be better off if scientists would leave things alone."

An index of modernity has been constructed using those statements. Each individual respondent has a modernity score based on his response to these "world view" statements. That score is being compared to several other variables in the questionnaire to indicate important factors related to a modern "world view." At this stage in the data analysis the most interesting results are: (1) that responses to the nine "world view" statements generally indicate a consistent ranking across the surveys with wholesalers most modern while farmers, consumers, retailers and truckers follow in that general order (processors were not included in this analysis), and (2) when we dichotomized on the basis of age, education, and innovativeness, in most cases the younger, better educated, and more innovative individuals appear also to hold modern world views. Innovativeness was indicated by an index based on the percentage of a specific list of marketing innovations which had been adopted by the individual farmer, wholesaler or retailer. We should point out that these generalizations are based on preliminary percentage figures without specific statistical tests of significance.

A second group of attitude statements was included in all surveys. These statements dealt with attitudes toward market institutions, market uncertainty, and government programs. The percentage agreeing with the statement "Supermarkets have all the business they are going to get," ranged across surveys from 17 percent of the wholesalers to 46.4 percent of the retailers. Hence the majority of respondents across surveys seem to think that supermarkets will continue to make inroads in retail food sales in Puerto Rico.

There was general agreement among all survey groups except truckers that the uncertainty in fruit and vegetable market channels has been reduced in the past ten years. It is significant that a majority of truckers disagreed, since basic market coordination developments have placed the greatest pressures on that group.

Response to two statements dealing with the milk and egg regulations in Puerto Rico indicate that participants throughout the marketing system as well as consumers believe that the milk and egg marketing

regulations have been beneficial to all. The percentage agreeing with the two statements was almost 80 percent plus or minus 5 percent. This is an interesting endorsement of government efforts to help coordinate agricultural markets.

Finally, farmers, wholesalers and consumers in the majority disagreed with the statement: "Government programs usually end up benefiting only a select group of politically influential businessmen." On the other hand, retailers appeared to be nearly evenly divided in agreement and disagreement with the statement, while only a slight majority (54.5%) of truckers indicated agreement with the statement. Hence, there is an indication that government programs are believed to be equitable by all groups except those groups of middlemen having the greatest concentration of small independent businessmen. The smaller retailers and truckers may feel that they do not get their share of the benefits of government programs.

The second group of attitude statements to be considered in this summary is a series of statements relating specifically to the marketing attitudes of farmers, truckers and processors. There were four statements on the questionnaires dealing with basic beliefs toward cooperative marketing and forward contracting. There was general agreement across the three surveys that marketing cooperatives and forward contracting would be beneficial and useful in the future. For example, 83 percent of the farmers, 74 percent of the truckers, and 67 percent of the processors agreed that farmers should organize cooperative groups to deal more effectively with wholesalers and retailers. This general opinion seems to suggest that there is some dissatisfaction with present coordination arrangements between farmers and their buyers. It should be pointed out that about 64 percent of the farmers are already members of some kind of cooperative association, which partially explains their high percentage of agreement.

There were two statements dealing with government regulation and services. In general there was agreement that agricultural production and market reports were accurate and that farmers (or truckers or processors) could count on government help in solving marketing problems. The single exception to

the above generalization occurred where only 46 percent of the truckers agreed that they could count on government help. This reflects reality, since in fact little government help is provided for truckers.

The third group of attitude statements administered specifically to farmers, truckers, and processors dealt with the bargaining power of supermarkets and processors. Again there was general agreement across surveys that supermarkets and processors possess and utilize the power to determine agricultural prices. Cooperative marketing associations appear to be regarded, even by processors, as a possible way for farmers to overcome that bargaining power and improve the coordination of the marketing system. In addition, on a similar statement, retailers and wholesalers agreed (94 percent and 85 percent respectively) that the organization of cooperative groups might be beneficial in general.

Finally, a series of statements was administered to retailers and wholesalers which were designed to indicate prevailing attitudes toward the elasticity of the demand curve facing individual food retailers. The results indicate that at the present time retailers and wholesalers as a group do not believe that reductions in retail food prices must necessarily reduce the retailers' profit. It appears that the "live and let live" attitude observed by Galbraith and Holton in 1950 in their study Marketing Efficiency in Puerto Rico is not so prevalent among food distributors today.

Future Analysis

As noted earlier, the analysis summarized above, in addition to some chi-square contingency analysis relating an assortment of variables in the surveys, is only the first stage of the analysis planned for the survey data. Additional analysis will include correlations, factor analysis, partial correlations and additional chi-square analysis.

Our aim is to analyze completely the data we have collected in an effort to determine the kinds and nature of relationships existing between such variables as economic actions, market attitudes, world view, innovation, communication, income, age, education, travel, and a number of other variables studied in this survey. We believe that certain dynamic relationships do exist and that to understand such relationships will put us one step closer to an explanation of the process of market development as a vital part of the greater process of economic development.

Communication Behavior and the Latin American Food Marketing Process; Some Preliminary Findings

Presented and Summarized by R. Vincent Farace

Scholars in the fields of economics and communication are beginning to fuse their theory and research into a joint study of the relationship between the economic behavior and the communication behavior of participants in economic systems. The Latin American Food Marketing Study represents one of the first major attempts to explore the ways in which communication behavior affects economic behavior, as well as to explore the effects of economic activities on communication activities. Clearly, much remains to be done in order to conceptualize and integrate communication and economic variables within the framework of general economic systems. Considerable effort has been devoted to both the initial conceptualization of the economics communication relationship, and to the gathering of basic data to evaluate our conceptualization.

From the viewpoint of communication theory and research we are concerned with the effects of various message sources, which transmit their messages through some combination of mass and interpersonal channels, to the receivers of these messages. The messages, of course, deal more with economic rather than other concerns, although political, religious, social, and other aspects of life may generate communications related to economic acts. It appears that the major role of communication is to aid in facilitating the coordination of the production and consumption sectors of an economy. Along with flows in goods and services, or labor, capital, raw materials and supplies, there exists a concomitant flow of communications about these things and their inter-relationships. Thus, the message system of an economy acts to inform participants throughout the economic system of the "resources" or outputs one participant has (this could be an individual, a firm, or an entire industry) and the needs and wants (desired inputs) other participants are requested to fulfill.

For example, we can study the messages about products available in the market place to which consumers can respond. These messages might refer to the availability of goods and services, the prices of these goods and services, their non-price features (such as "attractiveness" in the advertising sense), etc. We can also examine the message produced by these consumers, such as the requests of laborers for changes in working practices, or the comments to store operators about the merchandise he carries.

It is important to recognize here that the functioning of an economy's communication system is not incidental to the operation of the economic system. For one thing, the behavior of individuals--whether they are "producers" or "consumers"--can be shown to be regularly and reliably affected by the nature of the message inputs they receive. These effects can be noted independently of the effects produced by inputs in the more traditional economic sense of the term. Who says what to someone is often as important a determinant of his reception of a message and his action upon it as is the actual content of the message. The way these messages shape the individual's view of the physical inputs he receives may be as influential on his use of them as their actual characteristics.

Second, at the level of an entire economy, we can show that the communication system and the economic system are interdependent, each in turn setting the bounds or limit on activity of the other. Consider for a moment the elaborate television network in many western world countries. This network enables the dissemination of many messages about economic activities to vast audiences, on an immediate, multi-sensory basis. It can potentially reach a far greater audience far more quickly, with a more "iconic" representation of the goods and services, etc., referred to in its message than can any other communication system. Yet, equally clear, the availability of capital and various labor skills, plus other technical and social requisites, limits the development of such a coordinating mechanism, and hence limits its usefulness as a coordinator of the market place. It is on such bases as this that attention to development of a communication system should be integral in plans for fostering economic growth in less developed economies.

With this brief introduction, the remainder of this section outlines the kinds of communication questions which were asked in the Puerto Rican phase of this project, and discusses some of the analysis of communication and economic variables now underway.

I. The Kinds of Communication Questions Asked

Each group of respondents--farmers, truckers, processors, wholesalers, retailers and consumers--was asked a common set of questions about their use of mass communication, their exposure to the mass media, their sources of local news, and their knowledge of some of the major political figures discussed in the mass media.

The questions dealing with mass communication use asked the respondent to indicate his attention to radio, television, newspapers, and magazines. Mass media exposure was indexed by asking those respondents, who said they used a medium, to report how much of it they did in fact use (i.e., hours spent watching TV). To obtain a guide to their news-seeking behavior, respondents were asked to note where they obtained most of their local news. Finally, respondents' level of political information was evaluated by asking them to name the office holders of seven prominent political positions, such as the Director of Fomento Cooperative in Puerto Rico. This set of questions on mass media use and exposure, and knowledge about political figures, then, formed the common core of items asked across all six groups.

In addition, a set of items was tailored for each group to probe further certain of its potentially unique communication characteristics. These items include estimates of respondents' propensity to adopt innovations, to be viewed as opinion leaders in business circles, and to use special kinds of information sources (such as technical magazines or prices for the crops they handle)*

*These questions were devised by John T. McNelly, associate professor of communication and journalism at MSU: the items had been tested in previous research. Dr. McNelly directed the communication phase of the LAFMS project until recently.

II. Analysis in Progress

Mass communication has long been viewed as both a "cause" and "effect" variable in social phenomena. In some instances, the researcher would expect mass communication exposure to precede, or force, such things as knowledge of information conveyed by the media. In other instances, certain kinds of mass communication behavior would be considered the result of other influences. For example, it is frequently shown that personal income is associated with media use, since the wealthier are more likely to have income disposable for this purpose.

Analysis now in progress is exploring the relationships of mass communication use and exposure to the kinds of attitudinal, marketing, and other economic behaviors which have been discussed during the seminar. We are concerned with such questions as whether mass communication behavior is related to use of supermarkets, to a modernizing outlook, to readiness to adopt innovations, to knowledge and attitudes toward the market place, to success in business, to interpersonal economic trust, to propensity to hoard, etc. We are particularly concerned with the differences between respondent groups in these relationships. Locating these differences may make it possible to understand why certain kinds of respondents behave as they do, and may suggest the kinds of research needed to develop strategies to cope with these behaviors.

Each group of respondents in this study can be classified on such bases as age, personal income, education, business accomplishments, etc. A quite different kind of analysis is underway to develop an audience typological system based on respondents' attitudinal, economic and communication characteristics, instead of the usual demographic variables alone. We will examine patterns of responses across the variables from each discipline and isolate person "types." Then we will turn to the problem of relating inputs and outputs to the specific characteristics of each type. In this way we hope to yield fruitful and informative findings to the problem under study.

CHAPTER 7

MODELING AND SIMULATION

Input-Output Model of Puerto Rico

Presented by Jose A. Herrero

Summarized by John E. Griggs

The Planning Board of Puerto Rico has designed a model describing economic behavior based upon an analysis of the inputs and outputs of the principal sectors of the economy. This model has proven to be a practical and reliable tool for projection of the most important economic variables of the Puerto Rican economy.

As with all models, input-output analysis is based on certain assumptions. The more nearly these assumptions match reality, the more accurate the model as a reliable predictor of economic behavior. There are two basic assumptions of the input-output model: (1) final demand is assumed to be known and (2) the inter-industry flows required to satisfy that demand are determinable and fixed over a period of time.

The assumption of known final demand is a very limiting one in that no explanation of the level of final demand is given. The prediction of final demand is of itself a very important factor in the study of economic growth. The assumption usually referred to as the assumption of fixed technical coefficients is believed to be less limiting especially for short-run projections.

The mathematical formulation based upon these assumptions can best be explained by means of an example. Assume the existence of a hypothetical economy that has three different sectors: agriculture, industry and services. The final demand, gross output and the inter-sector flows are given in Table 7.1.

TABLE 7.1

Transactions of a hypothetical economy

Sales Purchases	Agriculture	Industry	Services	Final Demand	Gross Output
Agriculture	2	4	2	8	16
Industry	4	8	1	7	20
Services	1	3	2	4	10
Value Added	<u>9</u>	<u>5</u>	<u>5</u>	—	—
Gross output	16	20	10	19	46

The inter-sector flow portion of Table 7.1 and the gross output values are used to determine the technical coefficients which are then used to describe the required inter-sector flows necessary to satisfy specified levels of demand. For example, suppose that the agricultural sector sells four units of output to the industrial sector, and that the gross output of the industrial sector is 20 units. This implies that 20 percent of the industrial gross output originates in the agricultural sector, i.e. $4 \div 20 = 20\%$. In this hypothetical economy there are nine such determinable coefficients. These are called the technical coefficients of input-output and they describe the internal production relationship of the economy. (see Table 7.2)

TABLE 7.2

Technical coefficients

Sales Purchase	Agriculture	Industry	Services
Agriculture	0.1250	0.2000	0.2000
Industries	0.2500	0.4000	0.1000
Services	0.0625	0.1500	0.2000

The assumed behavior of this economy can be expressed in simple mathematical form using only the technical coefficients and the level of final demand.

Let the gross production of the three sectors be symbolized as:

X_A where X_A , X_I , X_S are the gross production
 X_I levels of agriculture, industry and
 X_S services, respectively.

If the final demand for the output of these sectors is given as the following:

Y_A where Y_A , Y_I , Y_S are the levels of final
 Y_I demand for the agricultural, industrial
 Y_S and service sector outputs, then the following relationship is known:

$$\begin{matrix} X_A \\ X_I \\ X_S \end{matrix} = U - A \begin{matrix} Y_A \\ Y_I \\ Y_S \end{matrix}$$

The values in the matrix A are the technical coefficients and U is a unit matrix. The exact mathematical derivation is not of direct interest since it results from the assumptions stated. The usefulness of this model lies in the ability to adjust levels of final demand and technical coefficients in order to study changes in the total outputs of specific economic sectors as a result of those changes.

One goal of the Latin American Food Marketing Study was to analyze the importance of distribution or marketing in a growing economy. Unfortunately, the input-output model did not, as structured, provide a method of analyzing the distribution sector. In order to use the basic model, it was necessary to establish the actual flow of goods from producer to

consumer. This required an almost complete adjustment of the input-output model to introduce the distribution sector into an input-output framework.

Drawing upon numerous secondary data sources, the new input-output model was obtained. As should be expected, a great deal of consumption was given in terms of final demand at the retail level. Prior to this, all final demand was stated as direct demand of the producing sector thus ignoring the existence of the distribution sector.

By changing the input-output structure in this manner, a number of important relationships could be studied. The most important for this particular project was to study the relationship between structural change in the distribution sector and the effect (direct and indirect) of these changes on final demand. By combining information on consumption behavior with changes in the technical coefficients of the distribution sector of the input-output model, changes in the distribution of expenditures between food and non-food items could be studied. This change in the nature of final demand has a direct effect on industrial production which may also be studied via the input-output model.

Changes in industrial production affect the flow of goods through specific distribution channels. Information concerning the absolute level of production coupled with knowledge of the channels these goods use yields information useful in avoiding distribution bottlenecks.

The problem of complementing input-output analysis with a study of distribution and final demand behavior is a very difficult task, but one sorely needed to aid economic planning.

Summary

The input-output analysis is today one of the most capable instruments for studying the complex interaction of the industrial sectors of an economy. Yet, this method in itself is not sufficient to explain economic growth.

The changes made in the standard input-output model to allow a preliminary study of marketing or distribution channels hopefully provide some additional insights which will be helpful in the study of the role of distribution in economic development.

Systems Analysis in Food Marketing Planning and Development

Presented and Summarized by Herman E. Koenig

The Food Marketing Problem

In the final analysis the marketing system--the food distribution system including the transportation networks--exists for the purpose of moving goods from the sources of production to the points of consumption. In this respect, the marketing system is a critical component of the regional or national economy. It plays a critical role in the economic development of geographic regions and it is an integral part of urban development. It touches almost every aspect of any society.

Consequently, all policies and decisions relating to the promotion, development, and planning of national and regional food marketing facilities should be viewed in the context of the socio-economic system to be served and the research efforts in the area of food marketing must be closely coordinated with research groups concerned with regional and national economic development and urban and regional planning.

Flow Demands. To promote effective development and planning in marketing, it is necessary to define the needs and the characteristics of the socio-economic complex to be served by the marketing system. What are the inter-regional flow demands in terms of the various types of goods, acceptable time delays, and consumption rates? These needs must be known both as a function of geographic coordinate system and as a function of time. It is necessary to be able to ascertain the extent to which proposed changes and developments in the marketing system will alter the economic growth of geographic regions and the shift in population density and consumption rates.

Finally, it is desirable to be able to determine, in a quantitative sense, the effect on the overall economic system of various types of contingencies. How sensitive, for example, is the behavior of the economy served by the marketing system to failures

caused by strikes, climatic conditions, revolts, riots and war? Will the interruption of a particularly vulnerable component of the marketing system cause a failure of a major portion of the national or regional economy and endanger the welfare of a significantly large group of people?

Facilities Development. In addition to establishing the flow demands among various geographic regions in terms of the types of foods and goods to be transmitted, there remains the problem of actually promoting the development of the facilities themselves. This is, decisions must be made on whether the government should promote the development and growth of additional transportation facilities, of more efficient wholesale and retail facilities or of more extensive production facilities. The capacities and limitations of the existing marketing facilities must be known; also their effectiveness in meeting the flow demands now and in the future must be evaluated against alternate marketing facilities of various designs and forms, some of which are still in conceptual stages.

The marketing facilities, whatever they are, must be integrated with the social habits and needs of the populace they serve. For example, if high volume and efficient supermarket-type retail outlets are deemed necessary, the transition of them must be smooth and have positive public reaction. The many technical problems of developing efficient, reliable, and effective marketing facilities must receive coordinated support as part of both a short-range and long-range effort.

Facilities Operation. The various components of the marketing system are provided by thousands of individual city, state, cooperative, and privately owned and operated firms and businesses. Therefore, effective operation of both the present and any future marketing facilities as an integrated system requires extensive communication and cooperative effort. Techniques and procedures must be developed for acquiring data from which advanced flow demands can be determined. Informational and technical services must be made available.

Fundamental technical research is necessary in the area of marketing techniques and practices so as

to effectively use the developed facilities and minimize risk.

Objectives of Systems Analysis and Simulation

It is the specific objective of systems analysis to provide tools that will help to solve the problems detailed above--to provide instruments for experimenting with the relative merits of alternate policies and programs of development in the field of marketing in the face of changes in the socio-economic complex it serves. The tools take the form of sets of simultaneous equations called mathematical models; and the experiments, called simulations, are usually carried out on a computing machine.

It is not an overstatement to say that ultimately the only quantitative way of evaluating, for example, the cost-effectiveness of the existing or any proposed marketing system in meeting the present and future demands placed upon it is to develop a mathematical simulation of the marketing system as an integral part of the regional economy and social processes. Such models are necessarily technically very complex and to be completely successful require a data base that is usable by modern computing machines and which can be up-dated continually. The spectrum of research and development efforts necessary to achieve such a simulation is vast and cannot be looked upon as a total source of solution to immediate problems. Rather, this kind of research must be promoted and developed from the point of view of long-range planning. This research can be looked upon as an attempt to increase the professional competence and capability of the scientific community and keep it abreast of the ever-expanding technical complexity of the marketing system in an expanding society.

Mathematical models that simulate both the demands that must be met by marketing systems as a function of a changing economy, and the influence the marketing systems have in shaping economic developments, can be viewed as an evolutionary process. In the course of development, perhaps three generations of models are identified. The first generation model identifies the basic structure of the system,

establishes the general form of the model, and defines the data requirements. Before a second generation model can be developed, a data acquisition and processing system must be developed to provide this required data base, hopefully in a form that is usable by a computing machine. If the model is to serve as an effective decision tool, the data acquisition system must include provision for periodically updating the parameters in the model.

The second generation model builds upon the data base defined by the first generation model, but may require additional refinements. Such refinements, both in the model and the manner in which the parameters are evaluated, combined with the results of experiments conducted on the computing machine, lead finally to a third generation model in which there is sufficient confidence and reliability to justify its use as a formal instrument of decision making.

A first generation model of reasonable sophistication might take from one to three years to develop and should provide immediate and significant payoff in the form of new understanding and qualitative or semi-quantitative insight into the problem. It cannot help but contribute significantly to new insight into the food marketing problem and is a necessary step in the direction of applying modern system theory to domestic problems.

Second and third generation models are perhaps 5 to 15 years in the future. But again it must be emphasized that research efforts in the pursuit of the ideal simulation model are accumulative in that one is always in a better technical position today than yesterday. In this respect the mathematical models in system simulations can and must be ever-increasing in sophistication and application--they serve as the guide in systematic development.

Finally, it must be emphasized that the cost and effectiveness of a formal simulation effort in the area of food marketing depends upon the extent to which the effort is coordinated with the research efforts of other groups concerned with developing simulation models for population growth and economies of geographic areas. Only if all groups concerned with

such research are apprised of the overall picture will it be possible to merge their efforts into a simulation model of the food marketing system as an integral part of the economy. Mathematical models of the economy must, for example, go beyond present input-output studies to include the dynamic changes created by the accumulation of production capital and inventories and by the delays associated with the growth and decline of industries. The models must be definitive to the point of identifying specific industries and specific geographic regions so that the spatial aspects of the food marketing problem can be included.

Mathematical models of population growth, development, and migration must be coupled with and related to variables which take into consideration changes in the geographic distributions of industrial activities and other changes in land use. Attempts must be made to develop automatic data acquisition and processing procedures in order to provide the vast data base necessary to develop the various sub-models required in the simulation. The almost total lack of an adequate data base usable by computing machines is without question the most serious limitation or deterrent to immediate or short-range simulations of economic, efficient marketing systems.

The theoretical basis for establishing and developing simulation models characterizing the interactions between the food market system and the socio-economic complex it serves is well established. The mathematical concepts and techniques are fundamentally the same as those developed in the electronic and aerospace industries for the analysis, simulation, and design of complex and intricate physical processes.

In general, it can be said that systems analysis is concerned with the quantitative simulation, design and control of processes that can be viewed as collections of interacting components or parts. The extreme flexibility and unique capabilities provided through systems analysis stem from mathematical models that are developed from a detailed study of the behavioral characteristics of the components of the system and the constraints imposed by

their interconnections. It is the only methodology that provides a systematic capability for experimenting with alternate system structures and controlling our management policies. It is the backbone of the unprecedented success in automation, electronics, and the aerospace industries. Although the applications of these techniques to socio-economic processes are limited at this time, it is nevertheless evident that the applications do carry over into these areas. Evidence of this carry-over is given, in part, by recent efforts of our aerospace industries in the State of California and contemporary efforts of many other practicing engineers and educators.

The report entitled "A Systems Approach to Higher Education" represents the results of very recent efforts to apply systems theory to the analysis and simulation of institutions of higher education. As compared to the food marketing problem, the system simulated in this report is relatively small and well defined and a data base from which to work is readily available. But earlier sections of this report indicate specifically how systems analysis applies to socio-economic processes.

Systems Analysis and Economic Modeling

Presented and Summarized by John E. Griggs

The basic objective of the model building portion of this project is to translate what can be empirically determined concerning the actual functioning of an economy into mathematical form. Since an economy is an extremely complex system, the tool which is used to describe it must be able to handle complex relationships. Since we are still in the novice stage of understanding how economies actually operate, the tool must be flexible in order to allow for numerous changes in the structure of the model.

As Dr. Koenig has pointed out, systems analysis has flexibility and has already been applied to extremely complex systems. Perhaps the most useful comments at this time should be directed at describing what approach we have been using to construct the economic models.

The basic assumption underlying systems analysis is that a complex system is best modeled by first breaking the system down into components. The components are then modeled in the manner which best describes the functioning of that particular component. While there are certain restrictions placed on the characteristics of the variables which are related mathematically, the form of the relationship is an empirical one. Given the models of the components, the behavior of the system can then be described in terms of the component model. This approach is exactly analogous to describing the functioning of a missile guidance system in terms of models of the electrical components which make up the guidance system.

Three types of relationships are sought in the development of models of socio-economic systems. The first type deals with relating together fairly homogeneous groups of things. Homogeneity in this sense is referring to similarities in response patterns with respect to specified variables. If one were to attempt to model each identifiable component in a socio-economic system, the model would rapidly become completely intractable with even the most advanced computer facilities. The use of demographic and attitudinal variables in order to group consumers into fairly homogeneous groups, in terms of consumption

behavior, is an example of this type of relationship. The grouping of supermarkets and colmados for modeling purposes as opposed to dealing with a single food retail component is another example.

The second type of relationship deals with quantifying the behavior of defined components. The relationship between the output flows and prices of food items to input flows and prices is an example of the second type of relationship sought. These are complex functions of both technological and behavioral characteristics. The task of the researcher at this stage is to determine the important variables which the component reacts to and approximate that component's response to the values of certain variables with quantitative expressions. This is undoubtedly the most difficult task and it also relates to the ability of the researcher to define components in such a manner as to make the task as simple as possible.

The third type of relationship is that which describes the pattern of interconnections between components. For the present, we will deal with interconnection describing the flow of goods, labor, and money between components as opposed to say the flow of information or ideas between components. Each of these relational problems is intertwined in that changes in any one type of relationship will cause the others to change.

A comparison between systems modeling and the standard input-output approach may be useful in grasping the task we are attempting. As Professor Herrero pointed out, the input-output analysis has certain restrictions which impair its usefulness for our project's purposes. It has historically ignored both the distribution sector and determinants of the level and type of final demand as an integral part of its framework. In the systems models, we are attempting to describe not only the production sector but also the distribution sector and the consumption/labor sector. We are also attempting to relate these sectors to each other.

Without becoming involved in the mathematics, it is helpful to discuss the structure of the model with the aid of a diagram or graph of the system. Chart 7.1 shows a highly simplified and aggregated graph of the system.

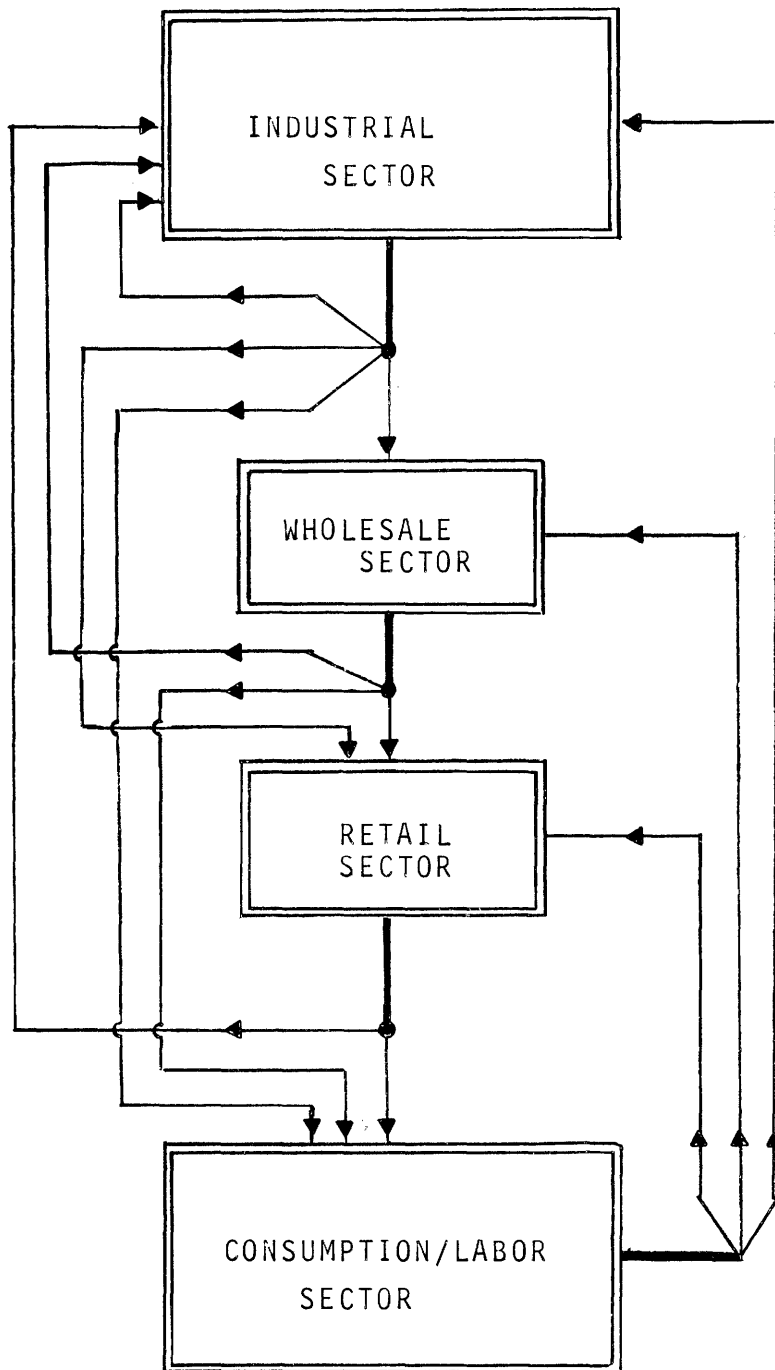


CHART 7.1

The Economic System

There are basically three components identified in this graph; the industrial sector, the distribution or trade sector (composed of the wholesale and retail sectors), and the consumption/labor sector. The import and export flows, the governmental sector and others have been ignored in order to focus on the basic structure. These other sectors must obviously be included in the economic models.

Each of these "black boxes" are properly viewed as components of the system and thus must be modeled. The methodology of systems requires that each of the edges or connecting lines in Chart 7.1 have two types of variables; a flow variable and its complementary variable, a price. The modeling task is to relate the two variables for each edge of a component to the variables of the other component edges. As already stated, this is a most difficult task and one which requires a series of successive approximated relationships before reliable ones are obtained.

As diagrammed, the components appear to be highly aggregated. This is not necessarily true in that each of the identified components may be treated as a system with a number of subcomponents. This, in fact, is how they are being treated in the modeling process. We are attempting to build pieces of the model based upon a number of smaller pieces which are more amenable to analysis.

Although this discussion seems highly theoretical or perhaps a better term is vague, it is a highly practical and empirical way of approaching the problem. It requires that the physical flow of goods be traced through the economic system and that the flow be measured not only in physical units but also in terms of the price per unit. It requires one to attempt to relate consumption behavior to the output of the industrial and distribution sector via labor inputs and thus wage income. It focuses attention on ways to break down a complex problem into a number of smaller problems, which hopefully increases the chances of obtaining empirically valid relationships. The use of such a model will hopefully provide a means for predicting the effect of changes in a component upon the operation of the entire economic system. Changes in the structure of the food marketing sector for example have resultant effects which are more than

simply changes in the component. If structural changes affect food prices, one expects some changes in the level and nature of demand. Given a fairly accurate model of the consumption behavior, it may be possible to predict what these changes will be. Any changes in demand will affect the output of specific sectors of the industrial sector and thus possibly affect labor inputs, which also has an effect on consumption behavior. This complex interaction between components is what we are attempting to study.

The problems of building such models are obvious and acutely recognized by our group. What we are seeking at the moment is a better understanding of how, in fact, the system is functioning at a given point in time. Much of the data needed is not presently available and thus there is much to be gained and little to be lost in attempting to apply this rather complex method of analysis. Based on the knowledge we are obtaining about the economic system, we are attempting to build predictive tools to aid economic planners and the social scientist. We know of no other way to approach such a complex problem than to apply empirical gained knowledge to the process of model building.

Application of Simulation

Presented and Summarized by Charles C. Slater

Broadly, modeling is useful to assess the costs and benefits of particular courses of action, investment, and institutional reform. Part of this evaluation process is the identification of reactions to the initial actions taken in any one sector in the economy. For example, the employment question remains an important problem in marketing development. Presently, underdeveloped economies are characterized by labor-intensive marketing systems. Improvements by substituting capital for labor displaces some of those who have previously been partially employed in the marketing system. This displacement is a cost associated with reform. The initial unemployment compensation of these people and later their retraining are costs which must be accepted as part of the price of obtaining efficiencies in marketing. The benefits which offset costs are the reduced costs or improved quality and/or the increased variety of products made available to the general public. The question then is whether the general gain as a result of reduced costs of basic consumption goods has offset the costs of displaced people who are presently involved in the marketing system. The only way to deal with the problem is to look at it in terms of general and subsequent effects or rounds of change over time which result from various strategies applied to alternative levels of employment change.

In Puerto Rico two such employment effects have been seen in the market development that has occurred to date. First there has been displacement, to some extent, of the old line wholesaler-importers by chains and cooperative organizations and direct mainland purchasing. Roughly 40 percent of the product sold on the island is purchased direct. Another important market reform which produces displacement is the impact of large retailers. The colmados have changed from small grocery stores that also sell alcoholic beverages to beverage stores that sell some food. This changed product mix has enabled the retailers to survive. This illustrates in general the nature of the problem with which modeling attempts to grapple.

Let us turn to the more general question of what is meant by costs and benefits. Costs involve employment levels that might be changed as a result of displacement of labor by capital; income distribution changes which might be disadvantageous; the direct costs of retiring old institutions with institutionalized positions; and finally the direct dollar costs of the constructing of new facilities and new institutions.

Benefits can be measured in terms of gross income, income distribution changes which favor greater demand, and capital changes. Using these kinds of criteria it is necessary, ultimately, to create a model to assess the "value" of options, using scarce resources to demonstrate the overall benefits to the economy of the developed tasks being fostered by the commercial agency.

If modeling and simulation as applied to marketing development are to be positioned into the cost benefits approach, the question of how to generate useful data for the simulation so that the program can become truly operational must be faced. A great deal of effort this past year has been expended to establish the relationship between what can be thought of as "soft data," relatively easy data to pick up by cross-sectional research and "hard data," relatively difficult time series data generally lacking in underdeveloped areas. The attempt will be made to relate attitude and demographic attributes of various subsectors of the population of consumers, retailers, wholesalers, and processors on through the production sector, in order to relate those factors of attitude to the hard or historic time series data. To the extent that this effort is successful, the model can be applied in areas where access to traditional hard economic information is limited. Thus, in general the relationships that are being sought to structure in the model will depend upon the attitudinal information and other data of a sort not requiring extensive time series information. The systems modeling approach holds great promise as a means of understanding the development tasks and development process. The approach as a general tool is an important breakthrough but there remain serious

and perhaps continuing limitations on its applicability to the development process. However, the investment now seems worthwhile.

CHAPTER 8

APPRAISAL AND APPLICATION OF RESEARCH FINDINGS

Presented and Summarized by
Charles C. Slater and Harold M. Riley

Introduction

This chapter has three parts. The first is a concise restatement of the overall approach of this study. The second part is a preliminary evaluation of the performance of selected aspects of the Puerto Rican food marketing system. The third lists recommendations for further changes in the Puerto Rican food marketing system.

The Approach of this Study

This study focuses on the improvement of food marketing systems as a means of accelerating economic growth. We have been concerned with both the efficiencies of physical handling and the social and economic effects of the marketing process. The marketing process has been viewed as a set of interdependent activities which link consumers, retailers, wholesalers, processors, truckers and farmers.

Three sets of assumptions conditioned our approach to this study. We assumed first of all that most of the less developed Latin American countries have idle or underemployed labor; have low rates of utilization of existing industrial capacity; and have capital hoarding. A second assumption was that risks and uncertainties involved in the marketing process can be described and means for reducing perceived risks can be devised. A third assumption was that systems analysis can be applied to the marketing process as a means of better understanding the functioning of the process, both qualitatively and quantitatively.

Several hypotheses are being examined. Some of the more interesting and crucial are as follows:

1. The demand for food in low income communities is responsive to both price and income changes.
2. Reductions in market risk lower costs and stimulate output.
3. There are significant differences in risk perceptions among market participants.
4. Market risks can be reduced by reforms in market institutions.
5. Market institutions can be changed by credit policy, organizational innovations and rule changes.

Central to the study has been the belief that marketing reforms can contribute significantly to rising levels of real income. Furthermore, it is our contention that the role of marketing institutions has been neglected by development planners. We are, therefore, attempting to identify more clearly the role of marketing in economic development and some of the practical ways that marketing reforms can stimulate both the demand and supply of food products. We view the marketing system as an important coordinator of economic activity whose role can be made more effective through careful study and purposeful reform.

Performance of the Puerto Rican Food Marketing System

It is difficult to evaluate the performance of a marketing system. In the first place there is difficulty in arriving at a list of appropriate criteria for gauging performance. Secondly, there is the problem of obtaining adequate evidence to use as a basis of judging the level of performance.

Four performance criteria have been selected for emphasis in our overall evaluation of the Puerto Rican food marketing system. These are as follows:

1. Efficient resource use
2. Progressiveness
3. Product variety and quality
4. Profit rates

Efficient Resource Use. In a macro sense resources are being used efficiently when there is no way to alter the pattern of use so as to increase the level of income. In relative terms any shift in the use of a given set of resources that increases output improves efficiency. When aggregative measures of efficiency are impractical, partial measures are sometimes useful. One such measure is output per worker.

There have been significant increases in the output of workers engaged in food wholesaling and retailing in Puerto Rico. Between 1958 and 1963 the number of workers in the food distributing field in Puerto Rico increased from 37,000 to 42,000. However, if there had been no change in dollar sales per worker there would have been approximately 60,000 employed in food distribution in 1963. Other evidence of improvement in efficiency is the decline in retail margins. A decade ago margins in food retailing averaged about 24 percent on sales. In 1964-65 margins have declined to around 18 to 20 percent.

In the retail-wholesale area of the food marketing system there appear to be significant opportunities for further reduction in operational costs, especially in the wholesaling function. The direction of change will be toward full-line, large scale mixing warehouses and away from small, limited line broker-wholesaler operations. The wholesaling function should be more closely coordinated with retailing through arrangements such as voluntary groups of retailers.

Turning to agricultural production, we observe that output per farm worker nearly doubled between 1951 and 1963. However, in 1963 output per worker was only \$1,400 in agriculture compared to about \$5,000 per worker in Puerto Rican industry. These are rather crude comparisons because different amounts of capital have been associated with each

worker. Nevertheless, one might conclude that there has been a significant increase in labor productivity in agricultural production but output per worker is still very low when compared with industry.

The overall farm to retail gross margin is another measure of marketing efficiency. Marketing margins for fluid milk are somewhat narrower in Puerto Rico than in mainland U.S. The margin between farm and home delivery is 10 cents per quart in Puerto Rico, while it is about 15 1/2 cents in the U.S. The margin between farm and store sales is 11 cents per quart in Puerto Rico and approximately 12 1/2 cents in the U.S. mainland. The farm to retail margin on eggs is about 26 cents per dozen in Puerto Rico versus 21 cents in the mainland. Gross margins on locally produced fruits and vegetables tend to be relatively high with many items having markups of 100 percent or more from wholesale to retail.

Progressiveness. Industries which generate and rapidly adopt improved technologies and which have programs to improve employee performance are progressive. The supermarket sector of food retailing in Puerto Rico has been progressive in adopting modern methods of operation copied largely from mainland U.S. In the largest retail food chain, Pueblo, one observes a very high rating on personnel development. In-service training and personnel policies which stimulate performance have been successfully introduced. Publicly supported personnel training programs have been made available to the food retailing industry through the Agricultural Extension Service and The Department of Commerce. Much less progress is evident in the wholesale sector of the food business and among the many small retailers.

Product Variety and Quality. These performance criteria are concerned with the satisfaction of consumer demands. Over the past 10 to 15 years there has been a sharp increase in the variety of food products available to Puerto Rican consumers. This is due mainly to the introduction of supermarkets which have imported most of their supplies from the mainland. However, an expanding food processing industry on the island is being encouraged by a program which includes the support of a food technology laboratory operated

by the University of Puerto Rico.

The quality of locally produced milk and eggs has been greatly improved over the past 15 years through public regulation which encourages improved handling practices. Much progress remains to be accomplished for meat and fresh fruits and vegetables.

Profit rates. Profit rates are an index of the effectiveness of competition in an industry. In the short run, high rates of return on invested capital can be justified as a reward for risk taking associated with innovation. In developing countries profit rates need to be relatively high to attract capital, particularly foreign capital. Also the risks in starting new business ventures tend to be greater in underdeveloped versus developed economies. It is interesting to note that the Puerto Rican agency attempting to attract new industries used a five-year pay-off period as a preliminary basis for screening feasibility studies on new industrial opportunities.

The net earnings before taxes of the largest retail food chain in Puerto Rico (Pueblo) compares favorably with the earnings of the most profitable mainland food chains. This firm has experienced similar rates of return since it was established in the mid-1950's. Much to its credit is its policy of reinvesting in the business to expand and improve operations.

There is very limited data on profits in other areas of food marketing in Puerto Rico. The Department of Labor's Minimum Wage Board has assembled operating costs and returns data for selected industries. Their reports show that milk processors (bottling plants) had an average return on their investment of 16 percent in 1963. There were wide variations in profit levels around this average, with several firms reporting profits in excess of 20 percent on their investment. Under the Puerto Rican Milk Regulation Program the margin between the farm price and wholesale price of milk is fixed by administrative action. Hence, processors' profits are not subject to the pressures of unrestricted competition.

Recommendations for Further Improvements in the Puerto Rican Food Marketing System

This study has emphasized the rapid changes that have been taking place in the Puerto Rican food marketing system. These changes are occurring as part of a broader process of rapid social and economic development. On the basis of the information and impressions we have gained through our research effort we are now ready to advance some recommendations for the further improvement of the food marketing system. These recommendations, which have been discussed with responsible individuals in government, industry and the university, are presented at this seminar to further test their validity and feasibility prior to the preparation of our final report. The recommendations are as follows:

Consumer Information and Protection. The consumer information program of the Agricultural Extension Service should be continued with greater emphasis focused upon the food buying problems of low-income families. Public action is needed to better protect consumers against unsanitary practices in the handling of locally slaughtered meat. Improved supervision of scales for weighing foods is also recommended.

Convenience Stores. Public policy and private effort should be directed toward the development of convenience stores to supplement the supermarket system that has emerged. Existing colmados face serious problems due to their dependence upon a large number of wholesalers and their lack of technical and business management skills. The convenience store program could be patterned after similar operations on the mainland and in western Europe. These stores are often small, family operated units which carry a limited line of high traffic items. Through close coordination with a full-line wholesale warehouse they maintain low inventories and high turnover. They receive technical assistance from the wholesaling organization. Through a franchise program or a voluntary chain organization, many of the present colmados could be transformed into more efficient convenience stores.

Supermarkets and Discount Centers. The introduction of supermarkets has benefited the Puerto Rican community through lower retail margins, increased variety, and improved quality of food products. It is recommended that the Puerto Rican government resist efforts to place unnecessary restrictions on the growth of supermarkets and discount centers. When problems of this nature arise, adequate attention should be given to the benefits and costs affecting consumers.

Wholesaling. The problems of food wholesaling continue to plague the island of Puerto Rico. In a sense the wholesaling revolution has not yet occurred. A new central market area is making it possible for food wholesalers located in the crowded area of "old San Juan" to move to adequate facilities. However, as yet there is only one large full-line mixing warehouse on the island, operated by the Cooperative Federation. A second is now under construction to serve the Pueblo supermarkets. We have been told that this new warehouse will also provide wholesaling services for independent retailers. In addition to the two full-line warehouses mentioned above, support should be given to a third somewhat more specialized warehouse to serve the convenience store program recommended previously.

The improvement of performance in food wholesaling is critically dependent upon changes in existing regulations and business practices. Two conditions seem to hamper modernization of food wholesaling. One is the local law which requires food processors to reimburse brokers for the expected future income stream if the contractual arrangement is broken. The other condition is the "exclusive product line" whereby local wholesalers maintain a tight control over branded products imported from the mainland, making it necessary for a local retailer to buy from many small wholesalers. Both of these conditions are significant barriers to the establishment and operation of full-line wholesale warehouses that can handle direct shipments of food products from the mainland.

Coordination in Fruit and Vegetable Marketing. The present system of marketing fresh, locally produced fruits and vegetables is not well adjusted to the needs of the supermarkets. The situation is especially acute in the San Juan area. Several adjustments are needed and some of them are now getting underway. Backward vertical coordination by large supermarket operators can be improved through full-time produce buyers, purchase agreements with growers and truckers, and more adequate produce handling practices in central warehouses and in stores. In general, horizontal and vertical integration of production and marketing processes would also improve market performance. This could be accomplished through producer associations marketing through a central agency or by the establishment of large-scale commercial producing and marketing units. These larger scale organizations may need processing facilities to stabilize market prices. Additional government rules and regulations are needed to facilitate the organization and orderly functioning of fruit and vegetable markets. Improved grading, weights and measures, market information and trade practice regulation are suggested as means to reduce risks in buying and selling.

Expanded Caribbean Trade. Steps should be taken to encourage trade with other Caribbean islands. Puerto Rican industrial products and processed foods could be exported in exchange for food products which can be grown advantageously in neighboring islands, such as the Dominican Republic. These food imports could replace some of the imports from the mainland and contribute to a general expansion of Puerto Rican industry and inter-island trade.

The Planned Fomenting of Marketing Development

The efforts to stimulate economic development in Puerto Rico ranged from tax incentive and vocational training to the actual government operation of business enterprise. Some of these efforts, as we have noted, were aimed at marketing institution development. The history of Puerto Rico's efforts reveal a pattern of actions and plans that seem to be effective in market development.

The first condition was the task orientation that brought the various interested parties to a common meeting ground. The Governor's Food Commission was such a forum, where the special interest groups dealt with common problems. Although this seems elementary, few of the monolithic structures which serve the special interest of farmer, assembler, processor or distributor have a common cause and forum in most areas, developed or otherwise.

It is interesting that the need for reform and development led the Governor to ask for studies of agriculture and food marketing, which were completed when the Commission was formed. Thus, the diverse interests of the Commission on Food were faced with well ordered facts. A consensus was reached and plans were then put in order to foment food marketing institution changes along with another industry which was designed for export or import substitution.

This concept of coordination to deal with a task across special interest groups contrasts with the check and balance form of most government cabinets. Ministers of Commerce, Agriculture, Central Banking and Planning are the general rule. A similar structure in Puerto Rico's Commonwealth Government was preceded by institutional reform. From this experience it is possible to imagine the kind of structure that would foster marketing institution development and reform.

The ideal structure draws its power from the central government and is ruled by a ministerial group responsible for specific sectors of the economy, as well as for fomenting development that reaches across the sectors.

The ideal internal national market development program would provide a means of identifying needs in institutions and actions which could be translated into active programs by the fomenting agencies' sustained approach (see Chart 8.1).

The benefit of such a coordinated, task-oriented approach would be the sustained attack upon programing the fomenting of changes. It would not prevent errors in judgment or in program actions, but it would encourage continued review.

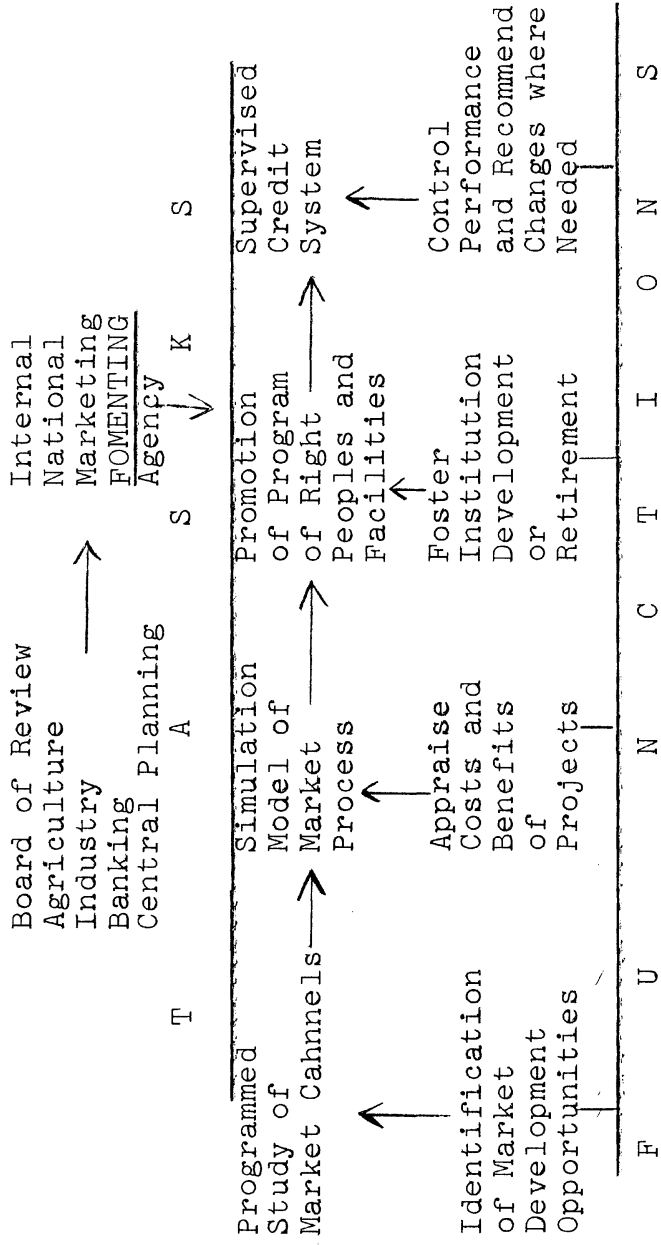


CHART 8.1
TASK-ORIENTED MARKET DEVELOPMENT PROGRAM

CHAPTER 9

DISTRIBUTION COSTS IN LESS DEVELOPED COUNTRIES

Presented by Richard H. Holton
Summarized by Robert W. Nason

Looking at the whole question of distribution costs in less developed countries, it would seem that reduction of these costs is a primary goal. But, lower distribution costs do not in themselves necessarily indicate that the whole process of distribution is more efficient; they might mean higher rather than lower per unit costs.

Hence, it is important to present a number of propositions about the principal factors that help to determine the unit costs of distribution. During the following discussion the various distribution services will be assumed to be constant.

The first proposition is that the greater the distance to the market, the greater the unit cost of distribution is likely to be. This is especially important for agricultural products.

The second proposition is that the higher the prices of production factors, the higher the distribution unit cost. For example, even though wage costs are presumably lower in less developed countries, entrepreneurial talent and credit costs are higher. Concerning credit, the decision of development banks to support, in essence, only manufacturing enterprises has virtually shut off credit for the development of the distribution sector. The argument is that there is already too much capital in distribution in less developed countries, so more capital would be just sending good money after bad. However, stimulation from new capital may create the competition needed to improve the efficiency with which existing capital is used.

The third proposition is that the greater the external economies, the lower the per unit distribution costs. This proposition raises the whole question of infra-structure; that is, the transportation, banking, and communication systems, etc. Here again, the less developed economies are generally in poorer shape.

The fourth proposition is that lower unit cost of distribution is likely with a greater annual volume of goods that move through a particular channel of distribution. For example, a farm produce area with enough volume to command daily pickup by a wholesaler greatly reduces risk and per unit costs. Less developed countries again suffer for lack of such high volume production centers.

The fifth proposition is that unit costs are surely lower the larger the average transaction size, because of relatively constant negotiating and billing costs, etc. Less developed countries tend to have smaller average transaction sizes.

The sixth proposition is that, the better the state of information the lower the unit costs of distribution. Less developed countries have fewer channels of communication and thus engender higher risk.

The seventh proposition is that the longer an individual distribution channel has been in use, the lower will be its unit cost. Greater understanding, which develops with time, will reduce transaction costs and cooperative friction.

The eighth proposition is that the denser the market geographically, the lower will be the unit cost of distribution. This proposition follows from the cost of distribution of goods to geographically divergent markets. Again, less developed nations have typically less dense markets.

The ninth proposition is that the greater the concentration of producers, the lower will be the unit cost of distribution. This proposition follows from the costs associated with assembly of goods from geographically divergent producers rather than from concentrated producers.

The tenth and final proposition is that the unit cost of distribution is adversely affected by the degree of distrust between participants in the distribution system. Trust reduces the need for various signals and thus reduces the negotiation process to a minimum.

In summary, less developed countries have good reasons why distribution costs are particularly high.

It is possible that in trying to modernize distribution channels, much more attention should be paid to the prospects for vertical integration. A simple example will illustrate this point. If retailers, wholesalers, and producers are independent, then an investment in the market by some channel members would depend on the marginal costs of that channel unit and the marginal revenue that can be derived from the expenditure. The shift in demand resulting from the investment affects other channel members' demand but not their costs. Hence, if the channel was integrated, the marginal cost would be the combined marginal cost of all members.

Under common circumstances, this integration would lead to a lower equilibrium price on the common market and/or it would lead to more inputs of distribution services on the part of all parties in the channel. It should be noted that such integration does not necessarily mean common ownership but perhaps a contracting arrangement.