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THE PUERTO RICAN ECONOMY AND UNITED STATES ECONOMIC FLUCTUATIONS

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TO MY PARENTS

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FOREWARD

It is a commonplace that fluctuations in the economically more advanced countries fall with multiplied violence on the developed lands, and especially on those that supply food and raw materials. Puerto Rico during the period of the Great depression provided a grievous example of this tendency. Even in the much milder recessions of the fifties, it cast the major shadow on the economic relations of the United States with the other Latin American countries. No result of industrial development and diversification is more to be welcomed than the prospect of reduced vulnerability to such fluctuation. In the case of the developing country, there is the companion question of the effect of the industrial fluctuations on the rate and reliability of economic advance. Together, these questions make the problem of the process and effects of the transmission of the business cycle from more to less advanced economy one of much practical importance.

Those of us who have been associated over the years with the Social Science Research Center of the University of Puerto Rico have been much interested in this kind of question. Poor countries must husband their research as well as their other resources. One way of doing this is to bring sound techniques of analysis on issues of unquestioned relevance to the community in question. In a poor country, it may better to fail in answering important questions than to succeed in answering unimportant ones. There is a place for research in the social sciences that is less severely guided by the seeming importance of the problem. But it should be undertaken in the largest amount by institutions that are most amply endowed with research funds.

Dr. Baer, in this study, has tackled the effect of recent economic fluctuations in the United States on the Puerto Rican economy and the meaning of the results for practical policy in the Commonwealth. The evidence has not been easy to handle, for effects in Puerto Rico have been masked by the growth of that economy, and the task would have been simplified, though at a cost no one would wish to meet, had the recessions studied been more severe. These difficulties notwithstanding, he has cast important light on

the effect of economic fluctuations as between the two economies. It will also be evident that he has brought both qualification and imagination to the analysis of his data. The study adds importantly, I think, to what is beginning to be — certainly as compared with the situation a decade ago — a very good understanding of the Puerto Rican economy.

John Kenneth Galbraith

CHAPTER I

INTRODUCTION

It is the purpose of this study to analyze the past, present, and possible future effects of economic fluctuations in the United States on the Puerto Rican economy. We are interested in this relationship especially in the light of the industrialization which Puerto Rico has undergone in the last decade. Since 1947 the real gross product of the island has increased at a rate close to six per cent a year, while per capita income has increased almost as rapidly. In the same period the structure of the economy has undergone and is undergoing fundamental changes. For example, in 1947 the contribution of agriculture to national income amounted to 26% in 1958 it amounted to 14%; manufacturing contributed 17% in 1947, while in 1958 if contributed 22%. A concomitant of these developments has been a substantial change in the «foreign trade» dependence of the island, which is conducted primarily with the U. S. Mainland. The ratio of exports of goods and services to gross product, which had increased from 32% to 44% in the 1940-48 period, increased by another 10% in the subsequent decade, and this was accompanied by a drastic change in the commodity composition of exports.

Thus the principal questions to which we shall address ourselves are as follows: does the change in the structure of the Puerto Rican economy and its closer relationship with the U. S. Mainland make it more sensitive to U. S. fluctuations? Through what channels are these fluctuations passed on to the island? But to answer these questions we shall have to carry our analysis still further, even in its broader context. Puerto Rico has been, and still is, a rapidly growing and changing economy, and this makes our kind of study more difficult and complicated. Due to

the strong growth trend, «normal» reactions to the Mainland cycle will hardly be discernible. The underlying growth factor considerably softens any impact. This leads our study into two broad channels. On the one hand, we shall have to examine the effects Mainland fluctuations have on the rate of growth itself, and on the other hand, we shall have to estimate the impact on the island as if most of the growth rate were to be eliminated.

The latter type of approach is of crucial importance to the policy maker. Since the development policies of Puerto Rican authorities have been such as to make the island's growth dependent primarily on external capital and its productive capacity dependent increasingly on external trade, (1) it is of great interest for the policy maker who is in charge of promotional activities for attracting capital, to know about the investment-behavioral patterns of Mainland entrepreneurs in various types of industries over the cycle, and especially to know through what channels and with what impact Mainland fluctuations will be felt when the growth factor will no longer be dominant. Only with such knowledge can effective countercyclical policies be pursued, e. g., can expenditure plans be made so that the total mix provides the most effective countercyclical palliatives. It might even be discovered that in order to shape Puerto Rico not only into a high-income, but also into a stable economy, the promotional arm of the government will have to put special emphasis on the attraction of industries and types of firms whose exports, production, and employment policies vary least over the cycle. In other words, whereas up to now the principal concern of the policy-maker has been the generation of maximum growth, he may in the near future become equally interested in the promotion of the type of structure the island economy should assume at higher levels of production in order to ensure maximum stability.

General Remarks About Business Cycle Propagation

Fluctuations in economic activity are spread from region to region or country to country principally through balance of

(1) This is actually a development not in line with the programs of most present-day underdeveloped countries which try to de-emphasize foreign trade. The Economic Commission for Latin America especially has worked under the assumption that foreign trade «is doomed to lag behind domestic growth, partly because of the frailure of developed countries to buy raw materials as their development proceeds, and partly because of the necessity of underdeveloped countries to buy capital goods from developed countries». Charles P. Kindleberger, *Economic Development* (New York: McGraw-Hill, 1958), p. 246.

payments on current account (especially changes in exports) and through changes in the flows of capital, especially flows of capital for long-term direct investment. The more a country or region is dependent on foreign trade, the more it will be sensitive to economic fluctuations in countries or regions with which it has close trade relationships.

The Puerto Rican economy should accordingly be extremely sensitive to outside economic fluctuations, since it is to a very large extent dependent on external trade. Although the above-mentioned ratios of export to gross product leave no doubt about a fairly high sensitivity of the commonwealth economy to changes in its external trade position, and, therefore (taking into account that «external trade» refers almost exclusively to trade with the U. S. Mainland), to occurrences in the Mainland economy, they do not reveal anything about the exact «degree» of this sensitivity. This will have to be found by examining the commodity structure of Puerto Rican exports in an attempt to discover the income and price elasticities of demand for the principal exports commodities.

Since the inception of the development program a dozen years ago, not only has the structure of the Puerto Rican economy changed drastically, i.e., in the sense of substantial changes in the relative importance of sectors from which income is generated, but over the same period of time these changes have been reflected also in the commodity structure of exports. In the immediate post-war period more than three-quarters of Puerto Rico's exports to the U. S. Mainland consisted of agricultural products and products closely related to agriculture, of which sugar, rum, and tobacco were more prominent. When one considers that even at that time total exports accounted for more than 40% of gross product, and that these products were very sensitive to the Mainland business cycle, especially via great fluctuations in prices, there can be no doubt about the almost helpless exposure of the island economy. (Witness the severe repercussions of the depression of the thirties on the island economy.) It should be remembered that until the post-war period these existed no pronounced development program, and hence no substantial growth of investment which would have acted to minimize reactions to external fluctuations.

The industrialization program has brought about a most striking relative decline in the importance of agricultural goods and a growth of manufactured goods in the commodity export

structure. The former rely only to the extent of 50% of their production on the external market, while the latter rely from 75% to almost 100% on the external (mainly U. S.) market. In other words, those industries which are constantly gaining in importance in domestic production and in exports depend for their existence mainly on the U. S. market. Unless the income and price elasticities of demand for the new products are smaller than the older ones, fluctuations in economic activity on the U. S. Mainland, which are passed on to the island via fluctuations in its exports, will have a greater impact on the island than before.

A greater degree of dependence on external trade, and especially on trade with the U. S. Mainland, does not necessarily mean that the Puerto Rican economy will be exposed to the full brunt of the U. S. cycle. Reactions could appear in three different ways: a) the export commodities could be among those variables which fluctuate more than the U. S. general cycle, and in that case a relative magnification would take place on the island; b) the export commodities could be among those which fluctuate in the same way as the average Mainland indicators; or c) they could be among those economic variables which fluctuate least over the U. S. cycle, and in that case Puerto Rico would be relatively immune from the Mainland cycle.

There are a number of additional factors which could mitigate the effects of increased exports to gross product ratio. First, a greater import content of exports, a change which one would expect with a substantial rise in exports of goods largely dependent on external supplies of raw materials and/or semi-finished products, could be of such a nature as to reduce the multiplier effects of export fluctuations. A relationship similar to that observed in Canadian external relations might also apply to Puerto Rico. Canada's balance of payments on current account tends to experience deficits in periods of prosperity and surpluses in periods of depression. One interpretation of this phenomenon was that domestic investment in machinery, equipment, and industrial construction have high import contents which leads to import surpluses in high investment periods and export surpluses during depressions. This relationship «is facilitated by the fluctuations in long-term capital imports that have financed a high proportion of Canadian investment in boom periods. To the extent that imports are cyclically unstable, they act as sta-

bilizers of domestic production. Thus a high export and import ratio may involve a low multiplier.» (2)

Secondly, it is important to take into account the type of enterprises the development program has been attracting. These can be divided into two broad categories: firms which have been set up in or have resettled in the island in their *entirety* (retaining, of course, marketing outlets on the Mainland), and firms or plants which are subsidiaries of larger Mainland enterprises. The former's rate of production will depend on general U. S. market conditions. Their operations will thus be closely related to demand conditions for their type of products on the Mainland market, the demand conditions depending on the income elasticity for the product.

The second types of firms, the subsidiaries, present some possibilities in addition to the simple dependence on Mainland variables. They can be divided into two subcategories: those firms representing horizontal expansion of Mainland firms and those representing vertical extensions. The former are simply the extension of capacity of existing corporations for producing a finished product. The second type are plants set up by Mainland corporations either to produce parts of the product which is assembled on the Mainland, or to perform an operation on a product shipped to the island for that specific purpose and then shipped back for further processing.

The horizontal plants' operations over the Mainland cycle are difficult to predict. They depend on the attitudes and/or policies of each corporation. If a downswing in economic activity reduces a firm's sales and hence forces a decrease in production, how will this come about? Will all the plants of the corporation curtail their production in the same proportion, or will certain plants be shut completely while others continue to produce at full capacity? If the latter is the case, which plant would be closed, the Puerto Rican plant or a Mainland plant? To what extent does this decision depend on cost and to what extent on noneconomic considerations? It will be obvious that depending on the answer to these considerations, the establishment of such firms could have intensifying or moderating influences in passing economic fluctuations along to Puerto Rico.

Similar assumptions could be made about plants forming

(2) G. Rosenbluth, «Changes in Canadian Sensitivity to United States Business Fluctuations», *The Canadian Journal of Economics and Political Science*, November, 1957, p. 482.

parts in the vertical link of the production process of Mainland plants. On the one hand, the plant might be just one of a number of the corporation producing an intermediary step in the production process. In that case, considerations similar to the ones mentioned above become relevant. If the Puerto Rican plant is the only vertical link in the production process, its operations might be more stable, reflecting simply general fluctuations in the output of the firm.

So far we have considered trade in goods and services as a channel though which fluctuations are spread. Fluctuations in the flow of capital will also have a major effect in the propagation of the cycle. Capital flows from one region or country to another because of differences in remunerations and risks. Actual and expected remuneration on capital which will induce flows are based on known or expected profit rates, which in turn depend on factor cost conditions and product market conditions. An underdeveloped region like Puerto Rico has to offer a certain minimum earning ratio above the remuneration which capital gets in the known Mainland markets in order to attract it. This was achieved by a program of tax exemption, of training labor which would be available to the Mainland entrepreneur at rates substantially below U. S. wage rates, and of other activities by development agencies which tend to produce cost benefits to the new entrepreneur. But ultimately, what determines the profit rate, or at least its size over the cycle, will be market conditions. Since Puerto Rican firms and U. S. Mainland firms compete for sales on the same market, there is a possibility that investment decisions over the cycle will affect both places in a similar manner. In a downswing there will be a reluctance to expand productive capacity and hence investment plans might be postponed or scrapped altogether. This might not affect Puerto Rico as much, if the decisions to invest there are based to a substantial degree on cost advantage and tax advantage factors rather than on simple considerations of expansion of productive capacity. There might thus be some hope that capital flows to Puerto Rico will not fluctuate as violently over the cycle as general investment expenditures on the Mainland.

The net effect of changes in investment activities of Mainland capital depends on the foreign capital content of invesment. It can be assumed that most of the machinery used is imported, while the contribution of construction net of imported machinery — labor and contruction material — comes from island

sources. (There is definite evidence that in construction activities in Puerto Rico more labor intensive methods are used than on the Mainland.) Thus the higher the proportion of island sesources used in investment activities, the more will the impact of fluctuations in investment activities be felt in the island.

There are a number of other channels through which the Mainland cycle can make itself felt. A downswing in U. S. economic activity decreases the net emigration of Puerto Ricans. This can contribute considerably to total unemployment on the island and cause hardships, since in order to gain fully from the industrialization program on a per capita basis, the birth rate has to decrease and/or net emigration has to continue at high rates. With a large number of Puerto Ricans living and working on the Mainland, the amount of money sent back has substantially increased in the last decade. These can also be expected to fluctuate over the cycle and thus cause additional swings in the disposable income of many island families. And finally, there is the effect on tourism, which has also flourished in the last decade.

Total multiplier repercussions on the island depend to a large extent on the consumption behavior of the population. The marginal propensity to consume has been extremely high on the upswing, but there is evidence to show that this is not necessarily so in the downward phase of the cycle. Once people have come up from an extremely low standard of living, once they have become familiar with the credit system of a modern society, these is a good expectation that they will try to maintain their consumption expenditures close to the newly reached levels. If such a «Duesenberry effect» holds true in Puerto Rico, the secondary repercussions of a cycle which is passed on from the Mainland might be relatively dampened.

Form of the Investigation

The various hypotheses stated above will be tested in the following manner. Chapter II will consist of a short analysis of the changes in the structure of the Puerto Rican economy since the 1930's, with an even shorter discussion of policies that have led to them. Since we are interested in the sensitivity of the island economy to the Mainland cycle under its newly emerging character, our chief interest will be the recessions of 1953-54 and 1957-58. Hence Chapter III will be devoted to a detailed

descriptive study of the recessions as they affected the economy *in toto* and its development program, and also a discussion of countercyclical policies which were followed consciously or unconsciously by the island authorities. Chapter V will be more analytical in content; in it we shall concentrate on the use of all quantitive evidence available in order to ascertain the impact of future recessions apart from the effects superimposed by secular growth, and effects on the growth trend itself. Chapter IV will concentrate on the policies of different types of firms which have settled in Puerto Rico over the cycle. We hope that the data analyzed will throw some light on some of the hypotheses advanced above about the «degree» of fluctuations passed on being dependent on the actions of larger firms which have subsidiaries in Puerto Rico. Chapter VI, the concluding chapter, will evaluate the total evidence, and then concentrate on policies to be pursued by the development agencies in fostering the type of growth thar will lead to a relatively stable economy and policies which the Puerto Rican government could pursue to minimize the impact of the cycle, in the light of this evidence.

CHAPTER II

CHANGES IN THE STRUCTURE OF THE PUERTO RICAN ECONOMY

Puerto Rico's Structure in the Pre-Industrialization Era. (1)

Until the 1940's the island of Puerto Rico was a typical example of a stagnant backward economy, with no raw material base and a very low per capita income. The principal portion of the island's income was derived from a few agricultural crops (principally sugar), whose prices acted in an erratic manner. From the beginning of U. S. administration of the island until the late 1920's, a large volume of mainland capital flowed into Puerto Rico in order to develop the sugar industry, which soon replaced coffee and tobacco as the principal staple crop. In thirty years over $ 120 million of private capital flowed into the economy to irrigate new lands, build sugar factories, develop transportation systems for the new crop. At the same time, the insular government contributed funds to develop social capital needs — roads, municipal utilities, power plants, etc. Although the development of the sugar industry increased the island's income and provided more job opportunities, this growth was not fast enough to keep up with the population explosion which was taking place. At the end of the 1920's, the average Puerto Rican could find work only four days of the week, and received an income of less than three dollars a week. (2)

The development of the 1920's also emphasized the cyclical disavantages of basing growth in the development of a handful

(1) Substantial portions of this chapter were published in the *QJE*, November, 1959.

(2) Harvey S. Perloff, *Puerto Rico's Economic Future: A Study in Planned Development* (Chicago: The University of Chicago Press, 1950), pp. 27-30.

of agricultural crops. It created a large class of seasonally unemployed workers and thus an internally generated business cycle. In the 20's, over sixty per cent of the working population was employed in agriculture, mostly in sugar, coffee, and tobacco. The extent of seasonal unemployment in those branches of agriculture during the middle of the twenties can be gauged by the following available measurements: monthly employment in the sugar industry varied in the course of a year between 60% and 125% of a year's average employment; in coffee, the variation was between 65% and 140%; and in tobacco, between 20% and 200%. Unfortunately, no data is available on the number of months worked by the average worker in those fields for that period of time. In the year March 1946, February 1947, the average worker in the sugar industry was employed 8.7 months, in tobacco 5 months, and in coffee 6.8 months. (3) These extremes are somewhat mitigated by the fact that these seasonal cycles do not overlap. Considering the multiplier reactions emanating from such yearly employment cycles, the picture of a perennially unstable economy emerges.

In addition to all the disadvantages of seasonal unemployment, this mono-cultural economy was also highly sensitive to outside fluctuations. The value of total exports to the U. S. fell from a high of $ 133 million in 1920 to $ 66 million in 1922, slowly rising again to $ 99 million in 1927, and then sinking again to $ 73 million in 1933. In the same period the index of Puerto Rican exports (1935-9=100) fell from a peak of 325 in 1920 to 128 in 1922, rising to 180 in the following year, and then gradually sinking to a low of 94 in 1933. This bleak picture should be counterbalanced to a certain extent by simultaneous fluctuations in the average price of imports. The terms of trade on a number of occasions also turned in Puerto Rico's favor as seen in the following ratios (terms of trade-import prices/export prices):

1918-19	81.1	1924-25	90.0	1930-31	100.8
1919-20	51.9	1925-26	86.6	1931-32	92,3
1920-21	55.5	1926-27	85.9	1932-33	87.9
1921-22	87.9	1927-28	93.0	1933-34	98.0
1922-23	63.4	1928-29	109.6	1934-35	104.8 (4)
1923-24	65.7	1929-30	108.7		

(3) Statistics derived from charts and tables reproduced in Perloff, *op. cit.* Even when workers were employed, at certain times of the year as many as 25% worked less than 30 hours a week.

(4) Perloff, *op. cit.*, p. 135.

In the 1930's, the economy plunged into the doldrums. Two hurricanes, which destroyed most of the sugar crops of 1928 and 1932, followed by the depression on the Mainland which resulted in substantial curtailments of markets and low price levels, drastically slashed the island's income, so that per capita net income dropped from a level of $ 122 in 1929 to $ 86 in 1933. Only through wholesale relief by the Puerto Rican Emergency Relief Administration was utter disaster prevented. Stagnation continued through the 1930's, and not until 1940 did per capita income again reach the 1930 level.

The Early Industrialization Program

Serious concern about systematic economic development was expressed by Muñoz Marín and his party which came to power in the legislature in 1940. Although his administration came into office with a development program based primarily in agricultural reform, which was supposed to lead to a stricter enforcement of a federal 500-acre limitation law, the creation of a Land Authority and an Agricultural Development Company for the purpose of increasing agricultural productivity and diversifying agriculture (e. g., introduction of pineapple and dairy production), it was soon realized that the over-populated island could not raise its per capita economic well-being by relying solely on an agricultural development program. Even the best techniques of increasing agricultural productivity and of diversifying agricultural production in an optimal way would not be enough to raise national income at a rate faster than population growth. The average yearly rate of growth of the population in the 1920's was 1.88%, and it rose to 2% in the 1930's. (5) A substantial rise in the standard of living would thus require a rate of growth of gross product substantially above this rate. For example, with a program designed to double the per capita standard of living within twenty years it would require a yearly growth rate of the gross product of 7% (assuming the population continues to increase at the 2% rate). In the 1930's the gross product hardly rose at all, and in certain years in the midst of the depression it actually fell. It was thus fairly plain that any program with

(5) This is a very high rate of growth when one compares it to the Indian rate of around 1%, the average rate of poor countries being around 1.8% and the average European rate .5% in the 1935-55 period. See G. Meier and R. Baldwin, *Economic Development, Theory, History, Policy*.

ambitions to raise substantially the standard of living of the population could never rely on agriculture to do the principal job.

This soon became obvious to the new administration, and it was decided that if any development program were to be successful it must concentrate on industrialization, in spite of the fact that the island had no natural resources which could support and dictate the direction of an industrialization program. In 1942 the island government created its key development agencies: the Puerto Rico Industrial Development Company (PRIDCO), the Puerto Rico Planning Board, and the Government Development Bank. Between 1941 and 1945 a number of complementary agencies were established: the Water Resources Authority, the Transportation Authority, the Communications Authority, and the Aqueduct and Sewer Authority. (6)

PRIDCO was most directly concerned with the creation of new industries, having a large amount of discretion in developing resources, from the planning and research stage to the operation of businesses. Its administrators were at first convinced that industrialization could best be achieved by creating government-owned and operated plants in certain basic industries. Once done, this was supposed eventually to attract private industry. PRIDCO constructed and operated plants in the glass, shoe, paperboard, and clay products industries. It also took over a cement plant constructed earlier by the Puerto Rico Reconstruction Administration.

This government-sponsored and operated development program was a failure. It failed to create the number of jobs hoped for, and it discouraged U. S. Mainland interests from investing in new island industries. It soon became apparent that Puerto Rican authorities did not have funds, the management, and markenting Know-ow to engage in full-scale industrialization by themselves. The initial program was unsuccessful in that but little private capital was attracted, and government operations were not profitable. This was reflected in the relatively small growth of private investment between 1940 and 1947 as opposed to public investment. (See Table 1.) In that period the percentage of private to total investment fell from 78% to 55%.

The initial program was not a complete failure, however, in the sense that the real gross product increased by 59% from

(6) For further details, see William H. Stead, *Fomento: The Economic Development of Puerto Rico* (National Planning Association), March, 1958.

TABLE 1

GROSS FIXED INVESTMENT IN PUERTO RICO
(millions of dollars or index number 1947-100)

	Total Gross Fixed Investment	Private	Public	Private as % of Total	Index Numbers of Columns			Operational Disbursement of Federal Agencies	
								Total	Index
	1	2	3	4	1	2	3		
1940	23	18	5	78	36	51	18		
1947	63	35	28	55	100	100	100	48	100
1948	100	60	40	60	159	171	143	48	100
1949	116	61	55	52	184	171	196	47	98
1950	109	49	60	45	173	140	214	60	125
1951	127	76	51	60	201	217	182	51	221
1952	150	77	74	51	238	220	264	46	264
1953	159	74	85	46	252	211	303	54	225
1954	163	88	75	54	259	251	268	63	217
1955	196	123	73	63	311	351	261	68	194
1956	207	139	68	67	329	417	243		171
1957	256	158	98	62	406	451	350		
1958	274	167	107	60	435	477	410		
Percentage change from:									
1940-7	174	94	460						
1947-58	335	377	310						

SOURCE: Puerto Rico — *Statistical Yearbook*, 1958, Puerto Rico Planning Board; Index number and percentages computed from yearbook data.

1940 to 1947, while per capita income increased by 22%. But even this advance has to be downgraded. During the Second World War there occurred a tremendous expansion of Federal Government activities in connection with defense and war. Thus the income derived from federal activities as a percentage of total income increased from 9% in 1939-40 to 24. 7% in 1943-44. Between 1939-40 and 1944-45, net income derived from Federal Government activities increased by almost 550%, while net income derived from all other island sources rose by only 108%. (7) In the post-war period, income derived from federal

(7) *Economic Development of Puerto Rico: 1940-1950; 1951-60* (Puerto Rico Planning Board), January 29, 1951, p. 9.

activities decreased drastically, contributing only 6% to the total island income in 1947-48. One could still consider that the industrialization program had some effect, since with the drastic slashes of federal expenditures on the island a stagnation and not a decline actually seemed to be setting in.

Government leaders realized in the early post-war years that in order to continue and to increase the rate of industrialization, in order to raise per capita income at a faster rate, something would have to be done to attract private capital, which had more resources and better know-how to create and expand industries in a profitable manner.

Revision of the Program

The new approach adopted in the late 1940's was to leave the «direct» job of industrialization in the hands of private capital, i.e., of creating and operating industrial firms, while the principal task of the agencies created for the purpose of conducting a development program would be to do everything possible to create an atmosphere conducive to the attraction and development of private industry. This would be done by collecting and evaluating relevant data for projection and promotion purposes, by training workers, by introducing relevant legislation, and by providing all kinds of services, including the building of overhead capital facilities.

One of the key features of the new program (also called «Operation Bootstrap») was the introduction of a law in 1947 which exempted new industries from taxation (income and property taxes) for a period of ten years. This is possible, since Puerto Ricans do not pay federal taxes (under the principle of «no taxation without representation»), and all income and indirect taxes are commonwealth taxes. The eligibility for this exemption was extended to all those manufacturing industries which did not exist in Puerto Rico prior to January 2, 1947, to those specifically mentioned in the Industrial Incentives Act (consisting mainly of those industries which already existed and which the government wanted to promote further), and to commercial and tourist hotels.

Other measures taken in the 1948 reversal of policy were the sale of the PRIDCO factories to private interests and the creation of EDA (Economic Development Administration) in 1950. The latter, which incorporated PRIDCO and other agen-

cies, became the chief economic planning and coordinating organ. Its basic function is three-fold: it does research, promotional and service work It collects data, provides background information for potential investors, and conducts extensive promotional Work crite Mainland, Through PRIDCO in builds and leases factory buildings (sometimes made to order for a particular type of enterprise), it screens and trains workers, and provides other technical services (e.g., instalation of machinery and equipment).

The Impact of the New Policy

There can be no doubt that this policy has paid off. Since the beginning of the program, more than 600 plants have been promoted and assisted. Their combined investment amounts to more than half a billion dollars, and they provide direct employment for more than 40,000 people. The types of firms which have settled range from textile and apparel products, shoe, furniture, and similar concerns, to those producing aircraft parts, machine tools, electric machinery, scientific products, and oil refinery. Some were set up by modest entrepreneurs, and some by well-known Mainland corporations.

The success of the Puerto Rican development venture is impressive no matter what data are used to measure it. (See Table 2.) From 1947 to 1958 the Gross Commonwealth Product more than doubled (real gross product rising by over 70%), while per capita income rose by over 80% (59% in real terms), which makes the island's per capita income higher than any of the Latin American countries. Total investment, which rose by 174% in the 1940-47 period, increased by 335% in the following decade. Private investment's share of total investment, which had fallen from 78 % in 1940 to 55 % in 1947, rose to only 60% in 1958. Failure to regain the pre-war share could be attributed to the fact that the industrialization program is of necessity dependent upon a large and continuing measure of public investments in social overhead capital.

Sources of Capital

Over 50% of investment fund's come from sources outside the island, the most important being direct investments, of

TABLE 2

PUERTO RICO'S INCOME
(in millions dollars or indexes 1954-100)

	Gross Comm. Product	Real * GCP	Per Net	Cap. Inc.	GCP/pop. in 1954 prices	GCP	Real GCP	Net	Inc.	Real Net Inc
1930				122					30	
1933				86					21	
1940	286	499		121	269	26	46		30	55
1947	609	704		254	327	56	65		62	67
1948	647	718		256	330	60	66		62	67
1949	712	797		272	364	66	74		66	75
1950	753	865		278	393	70	80		68	81
1951	828	928		318	418	76	86		77	86
1952	973	1,015		373	455	90	94		91	93
1953	1,053	1,072		400	483	97	99		97	99
1954	1,081	1,081		410	487	100	100		100	100
1955	1,116	1,114		411	509	103	103		100	102
1956	1,152	1,145		421	517	106	106		103	104
1957	1,204	1,151		446	519	111	106		109	104
1958	1,286	1,196		469	530	119	111		114	107

(*) This looks like GCP/Pop. in 54 prices.

Change in real per capita income: 1940-47 : 22%
1947-58 : 59%

Change in real gross product: 1940-47 : 41%
1947-58 : 70%

SOURCE: Puerto Rico — *Statistical Yearbook*, 1958, Puerto Rico Planning Board. Index numbers and percentages computed from yearbook data.

TABLE 3

PUERTO RICO'S DEFICITS AND ITS PRINCIPAL FINANCE
(millions of dollars)

	Balance of Payments of Goods & Services	Flow of Long Term Capital *	Unilateral Private Transfers	Unilateral Federal Transfers
1948	—157	18	—2	80
1949	—133	13	2	71
1950	—107	45	2	73
1951	—151	92	7	51
1952	—133	69	11	44
1953	—92	42	17	51
1954	—124	74	18	62
1955	—180	102	16	85
1956	—201	79	17	95
1957	—265	125	19	113

* Net change in external assets in Puerto Rico.

SOURCE: *Statistical Yearbook*, 1957; 1958; Economic Report to the Governor.

which in the recent past appoximately 70% consisted of new equity capital and the rest of undistributed profits. The reliance on Mainland capital for the post-war development spurt is particularly striking when one glances at the long-term capital flows which increased from $ 18 million to $ 161 million between 1948 and 1958. Much of this capital helped to finance the growing deficit in the balance of payments of goods and services between Puerto Rico and the Mainland. The great rise in imports was, of course, generated by direct investments of Mainland firms which took place in those years. (In the import structure, for example, the percentage of Machinery and Vehicles rose from 14.8% in 1948 to over 20% in 1958.) There was also a considerable inflow of capital via government borrowing on the Mainland and, finally, often more than half of the deficit was made up by Unilateral Federal Government payments, which have fluctuated considerably, and private unilateral transfers, which have risen from $ 2 million in 1949 to almost $ 20 million in 1958. (8

Since 1948 capital flows have covered between a half and a quarter of the deficit on goods and services. As can be seen in Table 3, capital flows to the island have usually slackened in times of Mainland recessions; this has been accompanied by a narrowing of the trade gap, and also by an increase in the percentage contributed by the federal government and private unilateral transfers.

Structural Changes

The main attraction of capital to Puerto Rico has been the cost advantages, cheap labor, attractive overhead capital facilities, tax exemption (if this can be counted as part of a lower cost element), while free access was given to the traditional and well-known Mainland market. It should therefore not be surprising that industrialization, which is usually associated with a decline in the relative importance of trade (especially on the export side), should be accompanied by a substantial growth in the relative importance of external economic relations. A rough measuring rod of this dependence on external trade is the ratio of exports of goods and services to gross product.

(8) Trade deficits are a relatively new phenomenon. Until the late 1930's surpluses were the norm. See Perloff, *op. cit.*, pp. 122-25.

The computed ratios in Table 4 indicate a traditional high ratio, which has been rising continuously in the last two decades, until exports of goods and services account for more than half of the gross commonwealth product. The height of this ratio is even more dramatic when one considers that only one of the many trade-oriented countries of Europe, the Netherlands, reached the fiftypercent mark, only a few the thirtypercent ratio, while such important trading nations as Germany and the United Kingdom had ratios in the low twenties.

A brief glance at Table 4 wil also show that Puerto Rico's extreme dependence on external trade is based almost exclusively on relations with the U. S. Mainland, to which 95% of its exports were directed. The ratio of imports to gross product is even greater than the export ratio, reflecting the persistent and growing balance of payments disequilibrium on current account mentioned above, and possibly a substantial growth in the import content of exports.

Since the inception of the accelerated development program ten years ago, the structure of the Puerto Rican economy, and hence also the commodity structure of its exports, has undergone some drastic changes. There has been a most striking decline in importance of agricultural goods and growth of manufactured

TABLE 4

PUERTO RICO'S DEPENDENCE ON EXTERNAL TRADE

	Exports *		Imports	
	GCP	% of Total Exports to US	GCP	% of Imports from US
1939-40	32		37	
1947-8	44	97	68	94
1948-9	41	96	60	93
1949-50	44	89	58	92
1950-1	44	94	61	91
1951-2	45	92	58	92
1952-3	51	95	60	91
1953-4	51	95	62	91
1954-5	50	97	66	91
1955-6	53	95	71	90
1956-7	53	95	74	89
1957-8				

* Goods and Services.

SOURCE: Computed from data given in *Statistical Yearbook — Puerto Rico*, 1958.

TABLE 5

PUERTO RICO'S EXPORT AND IMPORT STRUCTURE
(in percentages)

Exports

% of Exports to Total Exports, by Commodity Group

	1947-8	48-9	49-50	50-1	51-2	52-3	53-4	54-5	55-6	56-7	57-8*
1						0.1	0.4	0.6	0.6	1.2	1.4
2	0.6	0.6	0.7	2.1	2.8	3.0	3.4	3.2	3.2	3.4	3.8
3	70.9	70.3	63.5	60.0	56.7	52.0	45.4	42.0	37.7	32.8	28.5
4	4.9	5.1	6.4	4.3	5.9	5.3	6.3	6.6	7.5	6.0	6.1
5	18.1	18.5	22.3	25.3	23.5	24.1	25.3	26.0	26.2	27.0	25.8
6	0.1	0.2		0.4	1.0	1.0	1.5	1.3	1.5	1.4	0.7
7			0.8	1.5	1.2	1.7	1.7	1.5	3.4	5.8	9.8
8	0.2	0.2	0.1	0.3	1.0	0.9	0.7	1.4	1.1	1.3	1.9
9		0.3	0.6	0.4	0.4	0.8	2.7	4.1	0.6	8.0	8.0
10	0.5	0.4	0.7	1.3	1.5	1.7	2.2	1.8	1.1	1.4	1.8
11	1.6	2.1	2.8	2.3	3.0	6.5	7.3	8.1	8.3	9.4	9.4

Imports

% of Imports to Total Imports, by Commodity Group

1	12.1	11.8	12.0	10.1	11.5	10.5	11.4	10.7	10.0	10.1	10.9
2	3.9	3.6	4.3	4.5	4.7	4.6	4.3	4.0	3.9	3.6	3.8
3	21.4	20.4	19.3	17.3	17.8	18.5	7.1	6.0	15.2	14.4	28.5
4	2.7	2.9	3.1	3.2	2.9	2.9	3.1	3.4	4.1	4.4	6.1
5	15.3	14.1	17.4	18.8	17.0	16.9	16.8	16.2	16.8	16.1	25.8
6	5.9	5.1	4.7	5.1	5.5	4.9	4.4	4.1	4.5	4.5	0.7
7	4.9	6.0	6.0	5.8	6.5	6.6	6.8	6.4	5.3	4.7	9.8
8	7.4	7.4	5.9	6.9	6.8	6.3	5.7	7.4	7.9	8.5	1.9
9	14.8	15.1	13.9	15.3	14.3	15.8	17.2	18.6	17.9	19.5	8.0
10	7.2	7.7	7.5	7.8	7.7	6.8	6.3	6.8	7.6	7.4	1.8
11	4.4	5.2	5.8	5.0	5.0	6.0	6.7	6.2	6.6	6.5	9.4

* '57-8 data estimated from monthly statistical reports. Accuracy of import figures is doubtful.

SOURCE: Computed from *Puerto Rico Statistical Yearbook*, 1958; *Current Business Statistics*, Puerto Rico Planning Board, Bureau of Economics and Statistics, October-November, 1958.

1. Animal and Animal Products (edible)
2. » » » » (inedible)
3. Vegetable and Food Products and Beverages
4. Vegetable products, inedible, except fibres and wood
5. Textile fibers and manufactures
6. Wood and Paper
7. Nonmetallic Minerals
8. Metals and Manufactures, except machinery and vehicles
9. Machinery and Vehicles
10. Chemicals and related products
11. Misc. Items.

NOTE: Above categories leave out two items: US merchandise returned and Foreign merchandise— hence percentages do not add up to 100. Above are percentages of total exports and imports to US; do not include transactions with foreign countries which are minimal.

goods. (See Table 5.) For example, the category Vegetable Food Products and Beverages alone accounted for 71% of total exports in 1947-48, but in 1957-58 it had shrunk to 28%; while the category Textiles increased in the same period from 18% to 26%, Machinery and Vehicles from almost nothing to 8%, Miscellaneous items, which consist mainly of light manufactured products, rose from 1.6% to 9.4%. It should again be emphasized that this drastic change in the commodity structure of Puerto Rican exports occurred during a time of increased dependence of the economy on external trade, which is not only revealed by the high export to gross product ratio, but which is also reflected in the relative increase of net income originating in manufactures. (See Table 6.)

Industrialization has brought about substantial changes in the sources from which income originates. Especial note was made of the more than 10% drop in the importance of agriculture, balanced by a rise in manufacturing, construction, and investment expenditures by the Commonwealth government. Estimates have been made which show that by 1975, if the present trend in development should continue, national income will rise from $ 1,079 million to over $ 3,400 million, and that in 1975 over 40% will originate in manufacturing and less than 8% in agriculture. Also, while national income will triple, total employment will only rise from 555 thousand to 780 thousand; and during that time the percentage employed in agriculture will drop from 27% in 1958 to 11%, while in manufacturing it will rise from 14% to 32%. (9)

A change has also taken place in the distributive shares of income (see Table 7), the proportion going to Compensation of Employees rising from 56% in 1940 to 61% in 1947 and 67% in 1958, while income from business profits declined from 35% to 31%, and a noticeable decline also took place in the proportion of rental incomes. This tends to indicate that the spurt of economic development contributed to a rise in the standard of living not only by increasing the absolute size of the national product, but also by making the increment going to the labor force of greater proportion than the increment going to the other sectors.

(9) *Economic Report to the Governor*, Mid-year 1958 (Puerto Rico Planning Board), pp. 52-53.

TABLE 6

NATIONAL INCOME BY INDUSTRIAL ORIGIN
(percentages)

	1947	1952	1956	1957	1958
Agriculture	26	23	17	15	14
Manufacturing	17	14	19	21	21
Contract Construction	2	5	4	4	4
Transportation and other Public Utilities	7	7	8	9	9
Wholesale Trade	5	4	5	5	5
Retail Trade	12	10	12	12	12
Finance, Insurance and Real Estate	7	8	9	9	9
Services (personal and business)	2	2	3	3	3
Services (other)	4	4	4	4	4
Commonwealth Government	10	10	12	13	14
Rest of World	8	13	6	3	3

SOURCE: *Net Income and Gross Product of Puerto Rico - 1940 and 1946 - 1955* and *Supplements* 1956-7, 1957-88, Puerto Rico Planning Board. Computed from absolute figures

Wages and Productivity

Much of the rise in the average living standard is due not only to increased employment opportunities and government projects, but also to the considerable rise in the average wage rate, from $ .42 in 1948 to $ .84 in 1958. In 1948 Puerto Rican average hourly earnings of manufacturing production workers were about 20% of the U. S. Mainland average, while in 1958 this proportion had risen to 40%. Since cheap labor was one of the «natural» advantages of the island, the emphasis was at first on the promotion of labor intensive industries. It is true that lower wage rates are partly balanced by lower productivity rates, but apparently productivity has been high enough to make the lower wages a real cost attraction. Mainland minimum wage legislation does not apply directly to Puerto Rico. It is enacted in a modified form by the Puerto Rico Minimum Wage Board in order to adjust for the special economic circumstances of the island. That this body has much influence is fairly obvious when one considers that the average wage rate had doubled in

TABLE 7

DISTRIBUTIVE SHARES AS PROPORTION OF NET INCOME

	Compensation of Employees	Business Profits	Net Interest	Rental Income	Profits and Dividends Received from Non Residents
1940	56	35	2	9	—3
1947	61	35	1	4	—2.5
1950	63	31	1	6	—2.4
1953	67	29	1	5	—2.4
1956	66	32	1	6	—3.9
1958	67	31	1	5	—4.7

SOURCE: Computed from Net Income and Gross Product of Puerto Rico, *op. cit.*, see Table 6.

TABLE 8

AVERAGE HOURLY EARNINGS IN SELECTED PUERTO RICAN INDUSTRIES
(in dollars per hour)

	1952	1958
Food & Kindred Products	.424	.819
Tabacco	.337	.513
Textile Mill Prod.	.465	.851
Apparel	.340	.754
Paper	.613	.970
Chemicals	.554	1.056
Petroleum		1.142
Leather	.377	.641
Lumber	.443	.663
Stone, Clay, Glass	.602	.960
Metal Products	.633	1.026
Machinery		1.166
Electrical Machinery		1.089
Professional and Scientific Equipment		.906

1952 - October; 1958 - September.

SOURCE: *Employment, Hours and Earnings in the Manufacturing Industries in Puerto Rico*, series published by Department of Labor of The Commonwealth of Puerto Rico.

TABLE 9

UNEMPLOYMENT IN PUERTO RICO
(percent)

	January	April	July	October	Quarterly Average
1952	19.2	11.5	13.6	16.5	15.2
1953	19.2	10.0	12.4	15.8	14.4
1954	18.4	11.4	14.4	17.3	15.4
1955	19.1	10.4	13.6	14.2	14.3
1956	15.0	10.2	12.8	14.1	13.0
1957	15.7	10.0	12.8	13.1	13.0
1958	14.9	10.5	13.7	16.6	13.9
1959	15.9	10.6			

SOURCE: *Employment and Unemployment in Puerto Rico*, Quarterly Reports, Bureau of Labor Statistics, Department of Labor, San Juan, Puerto Rico.

TABLE 10

EMPLOYED WORKERS BY INDUSTRY GROUPS
(in thousands)

	Total	Agriculture	Manufacturing	Construction: Private	Construction: Government	Mining	Trade	Finance	Public Utilities	Service Industries
1948	589	214	103	35	41	(1)	86	2	30	75
1949	585	214	102	34	45	(1)	87	4	27	70
1950	596	214	106	27	45	(1)	90	3	30	77
1951	604	201	111	27	50	(1)	93	3	28	86
1952	571	190	90	33	51	2	94	4	26	79
1953	550	170	99	39	50	3	84	3	30	71
1954	540	172	98	32	50	2	83	4	31	67
1955	539	162	95	34	50	2	89	3	34	69
1956	558	159	99	38	55	(1)	93	4	37	71
1957	552	151	99	40	57	2	93	4	37	68
1958	554	151	91	37			97			
1959										
Jan.	545	133	88	35	66		97		38	81
Apr.	574	151	98	40	66		97		38	78

(1) Less than 2000.

SOURCE: Puerto Rico, *Statistical Yearbook*; also same source as Table 9.

increase in employment in construction, government, and public utilities have not been enough to absorb the more than sixty thousand people who have lost their jobs in the declining agricultural sector. Decrease in unemployment therefore should be attributed mainly to emigration. Net emigration since 1946 has varied between 21.5 thousand in 1954 and 69.1 thousand in 1953.

Influencing the Direction of Private Development

The essence of Puerto Rican industrialization is that the island's resources are put to work on unfinished products which are shipped out again as finished products or as products for further processing. The greater the value added, the more the island economy will benefit. The planners of EDA have thus tried to influence the direction of development in such a way as to have a maximum amount of integration, i. e., to have imports come to the island in as «prime» a form as possible, and to ship the products out as close as possible to marketable form. Since many of the firms settling on the island are too small to become large integrated operations, EDA has encouraged «supplying» industries to move into the island as soon as the market for their products warrants it. For example, many brassiere firms have moved to the island. As soon as a substantial number had set up operations, the development agencies tried to encourage supplying firms to move in — e. g., firms supplying buttons or elastic bands, etc. Through «feasibility studies» EDA tried to estimate when the market for a supplying firm would be large enough to warrant setting up operations. (11). This has also been the idea behind the promotion of oil refineries. Although it is quite capital intensive, it is regarded as a source of «raw material» for industries growing up around it — petro-chemical industries using much of the by-products of the refinery. (12)

(11) «Industrial feasibility research» is the expression used by EDA for its cost and market research studies, which are used as guides for the direction of its promotional program.

(12) This approach to planning and influencing development has been strongly advanced by H. C. Barton, Jr. Research Director of EDA, in his staff Papers - e. g., «Industrial Development Planning in Puerto Rico,» mimeographed paper presented to the Economic Planning Seminar of EDA, Oct.-Nov., 1958.

Much the same approach to planning has also been treated in a more formal sense by Albert O. Hirschman in his recent book *The Strategy of Economic Development* (New Haven: Yale University Press, 1958). In chap. 6, «Interdependence and Industrialization,» Hirschman differentiates between two investment inducement mechanisms - *backward linkage effects and forward linkage effects*. The former refers

Planning and Agriculture

The bulk of government planning and help has gone into industry, but agriculture has also received some encouragement. The old agricultural staples have suffered both in a relative and absolute way. On the one hand, mechanization has not been applied with as much rapidity as needed to overcome increasing costs, because of labor pressure against the introduction of labor-saving machinery; and, on the other hand, the rising wage rates in industry have naturally exerted a severe upward pull for wages in agriculture. The latter resulted in higher costs, since productivity has hardly kept pace with wage increases. Direct encouragement has, however, been given to the type of agricultural products which are import competing. Dairy and poultry products have been encouraged. Research has also been done on the possibility of establishing a flour and feed mill complex. According to EDA, «the basis of feasibility lay in a much broader conception of an agricultural industrial complex embracing the production of animal feeds, increased cattle, hog, and poultry production, and a modern meat packing establishment.» (13). Not only would this amount to a considerable saving from bulk handling of grain over the cost of transporting bagged flour or refrigerated meat, (14) but establishment of this interrelated complex would also open up a large number of other industrial opportunities.

Migration

A special advantage of Puerto Rico in its relation with the Mainland has been the opportunity of free migration, which has

to the input provision, derived demand, which «will induce attempts to supply through domestic production the inputs needed in that activity.» The latter means that «every activity that does not by its nature cater exclusively to final demand, will induce attempts to utilize its outputs as inputs in some new activities.» (P. 100.)

«Development policy must attempt to enlist these well-known backward and forward effects; but it can do so only if there is some knowledge as to how different economic activities 'score' with respect to these effects. Ordinarily economists have been content with general references to the advantages of external economies, complementarities, cumulative causation, etc. But no systematic effort has been made to describe how the development ought to be modified so as to maximize these advantages even though the existence of input-output statistics supplies us with a few tools of an analysis of this kind.» *(Ibid.)*

(13) *Annual Report, 1957-58* (Puerto Rico, Economic Development Administration), page 19.

(14) *Ibid.*: «Operation of such a complex could effect a transportation saving of the difference between the ocean freight on bulk grain (3 tons at $12) and refrigerated meat ($60 per ton).

substantially helped the economy in controlling its unemployment and in being able to reap the per capita benefits of industrialization. The yearly emigration has varied closely with fluctuations in the Mainland business cycle. In the 1950's it reached a high of 69,124 (1953) and a low of 21,531 (1954), the latter reflecting the Mainland recession. The average has been approximately 40,000 a year.

The Impact of Government Expenditures

I should like to conclude this survey of the changes in the structure of the economy with an estimate of the quantitative impact of the government in the development of the last decade. Although government receipts as a percentage of gross product have increased slightly since 1950, from 14% to 16% (this does not include public authorities), they are rather small when compared to the same ratio for developed countries. (15) Government expenditures amount to 19% of gross product. It is supposed to be typical for underdeveloped countries that the share of government receipts to gross product is rather small, ranging from 8 % in India to 20 % in Ceylon. The reason for this has been interpreted to be that «the more developed the economy the greater its productivity. The greater its productivity the larger the relative margin of incomes above strictly subsistance, and the larger this margin, the greater, generally speaking, the potential taxable capacity of the economy...» (16). This explanation could satisfy the Puerto Rican economy in the early stages of its development. It seems, however, that the small growth since that time has been partially due to the island's greater reliance on private enterprise for basic development and to the tax exemption system. It should also be noted that less revenue is needed because some essential services such as defense, which takes up a large part of the budget of many sovereign countries, do not have to be provided by the Commonwealth government. Many public agencies which provide overhead facilities (as does the Water Resources Authority), do not fall within the budget, and are financed by borrowing rather than by taxation.

(15) See H. T. Oshima, «Share of Government in Gross National Product,» *American Economic Review*, June, 1957, pp. 381-90.

(16) *Ibid.*, p. 384.

Another interesting phenomenon is the revenue side of the Puerto Rican budget. Approximately 52% of total revenues comes from excise taxes, 36% from income taxes, and the remainder from property taxes, licenses, and inheritance and gift taxes. The tax revenue constitutes 67% of total revenues, the balance coming from tax revenues returned by the Federal government (mainly from customs collection), federal grants-in-aid, and non-tax revenues. It is customary for governments of underdeveloped countries to rely to a much greater extent on indirect than on income taxes because of ease of collection, (17) but in the case of Puerto Rico the explanation lies rather in the widespread tax exemption program.

Government Expenditures and the Use of Resources

It was mentioned above that in the initial stages of its program the government development agencies promoted specially those industries which made use of the island's abundant resources — especially labor. The same principle is also followed in making public expenditures for social overhead facilities, but not always directly. When the government decides to build a road or factory building or hotel accomodations, it asks for bids from contractors. The winners have usually been firms using more labor intensive techniques than do similar firms on the Mainland. The public authorities, which often use their own resources for construction activities, also engage in more labor intensive techniques than do comparable Mainland undertakings. As long as wages are low enough to make a clear-cut cost advantage of labor over capital intensive techniques, there always will exist an automatic tendency to make use of abundant factors of production.

The Possibilities of Self-sustaining Growth

Once economic growth is achieved, with the help of substantial doses of public and/or private capital, the principal question which arises is: how long will a substantial rate of growth be dependent on *foreign* savings? At what point will growth have produced an economic structure which can generate enough

(17) Charles P. Kindleberger, *Economic Development* (New York: McGraw-Hill, 1958), pp. 197-201.

savings of its own, so that continued growth will be more and more self-sustaining?

Puerto Rico was able to achieve a 6%-7% annual growth rate in the last decade because of substantial inflows of capital. In recent years capital formation amounted to approximately 20 % of gross product. At the same time, total consumption expenditures of the island were larger than its gross product, and personal savings have for many years been negative (18).

This does not mean that there was no contribution from domestic sources to capital formation. In the last ten years approximately half of the latter has been financed by internal sources — undistributed profits, depreciation, and government savings. (19) That total consumption expenditures were greater than gross product implies that total capital inflows helped to finance not only part of net capital formation, but also a substantial amount of «excess consumption.» This is important to notice, because in order to judge potential self-propelled growth, one has to observe carefully the behavior of internal institutions contributing directly to capital formation.

According to projections made by the Planning Board, the great dependence of the island on foreign sources for an average growth of 6% should considerably diminish in the next fifteen years. (See Table 11.) The biggest single source should be the depreciation funds and the second largest are supposed to be personal savings. The latter's impressive growth will be the result of much higher incomes accompanied by higher propensities to save and the increasing availability of many types of savings institutions. Finally, government savings and undistributed profits will also contribute substantially. The dependence on foreign sources will have shrunk to less than 25% and should even be declining in absolute amounts.

(18)

	Consumption Expenditures *	*Gross Commonwealth Product*
1956	1,157,705	1,151,606
1957	1,210,239	1,203,537
1958	1,296,699	1,285,526

* Includes households, government, and municipal government.

(19) Although personal savings are negative on a net basis, a substantial increase in personal savings has occurred. For example, time and savings deposits in banks have increased from $52 million in 1950 to $162 million in 1958. The First Federal Savings and Loan Association has had a spectacular success since its organization in 1951 in tapping the funds of average wage earners. Its funds amount to approximately $40 million.

SOURCE: *Net Income and Gross Product, op. cit.*

Given certain reasonable assumptions (reasonable because of clearly discernible trends) — that as per capita income rises the savings habit will rise, that institutions for stimulating the latter will continue to grow, that enough incentives will always exert corporations to re-invest substantial portions of their profits, and that local entrepreneurship will develop sufficiently to make effective use of local savings — there appears to be a good probability that Puerto Rican economic growth will become substantially self-generating.

These projections should be taken with a large grain of salt. The general assumptions behind them are that the gross product will continue to grow at the rate achieved in the last decade, that by 1975 the Puerto Rican economy will have reached an average living standard equal to that of the United States in

TABLE 11

SOURCES AND USES OF CAPITAL FUNDS
(in millions of dollars)

	1947	1950	1955	1957	1960	1965	1970	1975
Total Sources	46	124	219					
Undistributed Prof.	14	6	25	22	38	52	70	95
Personal Savings	—38	—38	—35	—17	18	54	113	209
Government Savings	26	34	40	49	55	74	100	135
Depreciation	23	37	64	82	91	125	172	238
Net Inflow of External Capital	28	45	104	142	270	321	214	171
Statistical Discrepancy	—7	39	21					

SOURCES: *Net Income and Gross Product: Puerto Rico - 1940 and 1947-1955*, and *Proyecciones del Desarrollo Económico de Puerto Rico*, Junta de Planificacion Negociado de Economía y Estadísticas, Diciembre, 1957

1950, and that relationships between economic variables will be similar to those existing in the U. S. at that time, subject to certain modifications based on peculiar historical trends of the islands. (See second source mentioned in Table 11). For example, depreciation amounted to 6.9% of net income in 1955. For the U. S. in 1950 it was 7.5%. In the projection it is automatically assumed that Puerto Rican depreciation will amount to 7.5% of net income. Personal savings are supposed to climb to 5%, equal to the U. S. percentage in the early fifties. The specific

assumptions made — e. g., of the savings pattern of the average Puerto Rican family as it moves into higher income brackets, or about the habits of corporations in determining their profit policies — are never spelled out in the published reports of the Planning Board.

Altehough these projections are based on dubious procedures, they are not completely worthless. It is of interest to note that they represent also a policy goal. For example, in describing projected personal savings, the above-mentioned publication notes that the 5% savings will not necessarily be the result of automatic forces, but might require government actions to achieve it. These projections thus represent a goal that the government thinks is feasible, and toward which it will work. And a specific hope and aim of the government as revealed in these projections is to make the island's growth more self-propelling.

CHAPTER III

THE POST-WAR RECESSIONS: 1 — A DESCRIPTIVE ANALYSIS

Since most of the analyses, generalizations, and projections in subsequent sections are based on inferences drawn from both the changes in the structure of the Puerto Rican economy and actual experiences during post-war recessions, it is fitting to review the causes of two Mainland recessions, and to trace their effects on the Puerto Rican economy. We have chosen the 1953-54 and 1957-58 recessions. The reason for omitting the 1949 downturn is that the economic development program had then just gotten underway, and the structure of the economy had not changed drastically enough to afford observations which might be used readily for generalizing purposes.

The 1953-54 Recession

Causes and Characteristics of the Recession on the Mainland

The 1953-54 Mainland recession lasted thirteen months, according to the business cycle chronology of the National Bureau of Economic Research; it extended from a peak in July, 1953, to a trough in August, 1954. It originated in two main developments: a decrease in defense expenditures, and a decline in the rate of increase of private consumption expenditures. (1). Absolute increases of the latter in the last quarter of 1952 and the first two quarters of 1953 were 6.8, 3.5, and 2.8 billion dollars. One reason alleged for this was the great bulge in consumer expenditures in

(1) Most of the review of the U. S. recession is based on the analysis in *Economic Report of the President*, January, 1955, and Bert G. Hickman, «The Contraction of 1953-54,» *The Review of Economics and Statistics*, February, 1958, pp. 36-48.

the latter part of 1952, the aftermath of a prolonged steel strike which had kept consumption previously at relatively lower levels. Another interesting phenomenon was the relatively increased expenditure for services and automobiles out of disposable income, and the relatively diminished expenditure for other goods, which meant that the rate of increase in the purchase of non-automotive durable goods and non-durable goods lessened even more. With the leveling of sales in early 1953, there was a pronounced increase in the inventories to sales ratio, which was reenforced by sizable decreases in defense expenditures. The latter declined by $ 3.6 billion. The combined decrease in expenditures on defense and on the declining sector of consumer goods amounted to $ 7.5 billion in the last half of 1953; but with offsetting increases in other principal categories of final demand, reduction in final expenditures amounted to only $ 2 billion, and therefore «had production declined only in proportion to final sales, the drop would have been small indeed.» (2). But declines in all stimulated a drastic reduction in inventory investments of $ 8 billion, causing the GNP to drop by $ 10 billion instead of $ 2 billion. These events were accompanied by a drop in the production of consumer durable and nondurable goods of about 25%, and among the sectors of industrial production «reductions of 10 % or more were recorded for textile, apparel, leather, and rubber products in the non-durable group and for primary and fabricated metals, electrical machinery, and furniture and fixtures in the durable group.» (3).

The recession entered a second stage in 1954. Consumer expenditures which had declined through the 1953 phase now became an expansionary force, and were accompanied by a rise in residential construction, sustained rises in state and local expenditures, and in net foreign investment. All these forces overcame the deflationary pressure of falling federal expenditures. The rise in consumer expenditures could be attributed to a rise of disposable income, despite the fall in personal income from production. This was caused by the usual automatic changes in tax receipts and transfer payments induced by the recession, and by reduced rates of personal income taxation which became effective on January. 1. However, observers do not simply attribute the rise in consumer expenditures to changes in disposable income. They also account for it to a large

(2) Hickman, *op. cit.*, p. 40.

(3) *Ibid.*, p. 41.

extent by a rise in the consumption function; e. g., although disposable income increased by only $ 3 billion between the last quarter of 1953 and the third quarter of 1954, consumption expenditures rose by $ 7.5 billion, and savings out of income dropped from 8.3% to 6.4% (4).

The early revival of consumer expenditures is important when compared to the drop in federal expenditures by $ 10.5 billion from the fourth quarter of 1953 to the second quarter of 1954, and a drop of a billion dollars in business fixed investment. With a $ 5 billion rise in consumer expenditures, and a $ 1.5 billion rise in residential construction, net foreign investment and state and local expenditures, final expenditures fell by only $ 2.5 billion. GNP actually rose by one billion, mainly because substantial decreases in inventory decumulation occurred. (See Table 12.) In the last half of 1954 recovery started to take place, with aggregate final expenditures turning upward in the third quarter, and with an abating rate of decline of federal expenditures. A temporary spurt of inventory liquidation provided a short setback to the expansionary forces, and GNP rose by only $ 1 billion in the third quarter. But in the last quarter of 1954 a vigorous expansion set in.

Effects of the Recession on Puerto Rico

With our knowledge of the structure of the Puerto Rican economy, we would expect the above events to have had the following effect: decreases in the exports of textile products, apparel, electrical machinery, furniture, and fixtures. These products are of increasing importance in the export structure, and with inventory decumulation on the Mainland and decreases in industrial production one would expect such exports to be substantially affected. The second reaction one would expect because of decreases in the opening of new plants, caused principally by Mainland market shrinkages. But this might be mitigated by the relatively small decreases in gross private fixed investments, the maximum decrease of which was only $ 2 billion between the third quarter of 1953 and the second quarter of 1954, compared to a shrinkage of $ 9 billion in total gross

(4) This rise in the consumption function has been attributed mainly to improved expectations resulting from tax cuts, capital gains in the stock market, intensified selling efforts, price reductinos, and more liberal credit terms.

TABLE 12

THE RECESSION OF 1953-4 — COMPARATIVE DATA

U. S. Data (billions of dollars) *

	GPN	Consumption Durable	Consumption Non Durable	Gross Priv Investment	Changes in Business Inventories	Index of Industrial Production (1947-9 = 100
1953						
1	361.6	30.2	118.9	51.5	2.0	135
2	367.4	30.6	119.8	53.5	3.1	136
3	366.3	30.5	118.9	51.8	1.1	133
4	357.5	28.0	118.6	44.5	—5.2	130
1954						
1	358.1	28.5	118.9	46.5	—2.5	125
2	358.7	29.2	120.1	48.3	—1.5	124
3	360.0	29.4	121.3	46.8	—4.1	121
4	367.7	30.4	122.0	51.9	0.5	129
1955						
1	379.0	34.7	122.4	55.6	2.7	135
2	387.7	35.3	124.8	59.7	4.6	138
3	397.0	37.2	127.4	61.4	3.3	137
4	402.8	35.4	129.2	65.4	6.3	134

Puerto Rican Data (millions of dollars) **

	Total Exports	Total Imports	Unemployment (%)	New Plants Starting Operations (No. of Plants)	Plants Discontinuing Operations	Index of Industrial Production (1952-54 = 100 Total	Non-Durable	Durable
1953								
1	70.4	115.6	19.2	15	2	82.6	89.1	65.6
3	86.2	116.5	10.0	32	5	93.6	98.6	80.9
2	91.7	113.5	12.4	19	3	102.0	104.6	95.3
4	80.6	137.9	15.8	17	5	109.4	112.1	102.6
1954								
1	76.5	116.2	18.4	22	6	109.6	109.2	110.5
2	83.7	137.0	11.4	16	9	115.5	116.1	114.0
3	81.2	129.7	14.4	12	15	112.4	112.4	112.5
4	94.1	133.3	17.3	11	7	128.2	122.6	142.5
1955								
1	67.0	134.3	19.1	18	6	134.6	132.4	140.5
2	100.1	137.8	10.4	15	4	158.1	157.9	158.5
3	103.0	123.8	13.6	11	4	153.2	148.4	165.5
4	93.5	150.7	14.2	25	6	160.2	153.7	177.2

* All data seasonally adjusted, except Industrial Production.

** Data *not* adjusted for seasonal variation.

SOURCE: *Business Statistics, 1957*, U. S. Dep't. of Commerce; Puerto Rico, *Statistical Yearbook*; EDA Reports; U. S. Dep't of Commerce, Bureau of the Census *U. S. Trade in Merchandise and Gold and Silver with U. S. Territories and Possessions*

investment between the second quarter of 1953 and the fourth quarter of 1954.

As is obvious from a glance at Table 12, the Puerto Rican data are not seasonally adjusted, and therefore must be examined very carefully. One must also consider the strong growth trend which pervades all Puerto Rican data. There can be no doubt of a slackening in the export sector in 1954. This is especially true of the second and third quarters, which are usually the seasonal peak. Based on export figures, it would seem that the brunt of the effect of the Mainland cycle on exports fell during the third quarter when exports were over $10 million less than in the previous year, which also represented the trough in the mainland. There is, however, a definite lag of three quarters, since decrease in consumer sales on the Mainland and peaks in inventory decumulation were reached in the last quarter of 1953.

There seems to be a lagged relationship of about two quarters when one compares total Puerto Rican exports to overall industrial production on the Mainland. Here the trough was reached in the third quarter, which was also the low point in Puerto Rican exports. The latter are examined in a more detailed fashion in Table 13, where each of the principal export items is compared to Mainland industrial production in the same industry. Production of textile products on the Mainland started to decline after the second quarter of 1953 and reached a trough in the third quarter of 1954, having fallen 19 points; apparel products, which bulk large in Puerto Rican exports, started to decline after the first quarter of 1953 and also reached a trough in the third quarter of the following year, having declined 18 points. Puerto Rican exports in this category seem to have been affected in the last quarter of 1954, and the first quarter of 1955, when they reached a trough. There thus occurred a lagged relationhip between industrial production of textiles and apparel on the Mainland and textile product exports from the island. While industrial production was falling drastically on the Mainland, exports continued to rise, although mostly at a smaller rate, and only when production started to recover on the Mainland did exports decline, reaching a trough two quarters after the Mainland trough. Explanations for this phenomenon are varied. First, there is the growth trend; the rate of openings of new plants during the last half of 1953 and the first half of 1954 was very strong in textiles and apparel

TABLE 13

a) U.S. INDUSTRIAL PRODUCTION AND PUERTO RICAN EXPORTS 1953-4

(For U.S. Index of Industrial Production 1947-9 = 100, P.R. Reports in Millions of Dollars)

	Fabricated Metal Products		Non-Electrical Machinery	Electrical Machinery	Machinery & Vehicles	Textile Mill Products	Apparel	Textiles (Total)	Paper & Allied Products	
	U. S.	P. R.	U. S.	U. S.	P. R	U. S	U. S	P. R	U. S.	P. R
1953										
1	136	.7	150	208	.6	110	118	18.5	137	.8
2	139	1.3	148	191	1.1	111	110	17.6	134	1.5
3	137	1.5	137	189	1.1	100	108	20.1	130	1.2
4	131	.5	137	189	2.1	94	102	21.6	131	1.3
1954										
1	123	.9	132	172	2.8	94	112	21.7	131	1.7
2	121	.8	126	163	3.3	94	103	20.7	135	1.0
3	121	1.2	119	170	3.3	92	100	23.6	131	1.3
4	125	1.8	122	201	4.0	100	104	22.9	137	1.1
1955										
1	126	1.1	129	194	2.5	107	117	20.5	146	1.2
2	133	1.1	135	184	4.2	108	113	21.7	154	1.4
3	137	1.1	133	188	4.5	102	107	25.9	150	1.7
4	140	1.0	143	209	6.3	110	113	26.6	157	2.5

b) SELECTED P. R. IMPORTS

	Chemicals		Food & Beverages		Non-Metalic Minerals	Textile Fibers & Mfgs.	Vegetable Food Products & Beverages	Animal & Animal Products	Machinery & Vehicles	Chemicals & Related Products
	U. S.	P. R.	U. S.	P. R.						
1953										
1	147	1.1	98	40.2	7.6	18.4	21.9	12.6	19.8	6.6
2	148	1.1	103	45.0	8.1	20.5	21.0	11.9	19.4	7.7
3	143	2.1	118	48.8	8.1	20.4	20.1	13.3	18.8	7.6
4	148	1.9	110	30.4	8.0	22.4	20.9	14.5	20.4	7.8
1954										
1	148	1.2	97	33.4	6.0	17.4	20.0	12.8	18.5	6.1
2	145	1.8	103	40.9	9.8	20.7	20.5	13.9	24.1	8.1
3	144	1.8	115	32.0	7.7	18.6	21.8	13.7	21.2	7.8
4	156	1.8	109	41.2	7.2	22.7	19.6	13.3	25.8	7.7
1955										
1	162	1.7	98	19.7	9.4	20.0	21.7	15.4	23.7	9.2
2	165	1.3	105	51.9	9.0	23.5	20.8	13.7	26.7	11.3
3	164	1.3	117	47.0	7.3	20.0	21.1	13.3	20.4	10.2
4	177	.9	114	28.0	8.7	26.5	21.4	14.2	27.4	10.4

SOURCE: See Table 12.

(e. g., eleven new firms starting operations in the first quarter of 1954). Their contribution to exports, even in a declining market, was bound to bolster total exports. Second, many EDA-promoted firms work on a contract basis, as subsidiaries of Mainland firms. While sales and production were declining on the Mainland, island plants would keep on delivering for the period of the contract, thus maintaining exports.

The pattern in most industries usually was a decline in the rate of growth of exports during most of 1954, with absolute declines taking place in the last quarter of 1954 or the first quarter of 1955. The proportional decline in most cases was larger for Puerto Rican exports than for the respective industrial productions on the Mainland, though the duration of the decline was much shorter for Puerto Rican industries. The most important export categories of Puerto Rico fall into the type of U. S. industries which experienced a greater than average decline in industrial production than the general average index. (Compare the decline in total industrial production in Table 12 to individual declines in Table 13.)

There was a definite lag in the reactions to the Mainland recession of the number of new plants starting operations on the island. If we discount the extraordinary spurt in the second quarter of 1953 (Table 12), it would seem that actual reactions set in only in the second quarter of 1954, three quarters behind the Mainland indicators, reaching a trough in the last quarter of 1954. The reason for such a lag is that plants opening operations were promoted a number of months before. Thus when the Mainland recession set in there was probably a backlog of promoted plants which engaged in investment activities even after Mainland investment had gone down. The recession is felt much earlier when measured by the number of firms promoted. (5) According to the best authority on the subject matter, «Promotion seems to lag somewhat behind production on the way up but to respond quickly to a decline». (6)

It is also evident from Table 12 that the recession had some effect on the number of plants discontinuing operations during 1954, the peak being reached in the third quarter, which was also the trough point of the Mainland recessión. The

(5) «Firms promoted» have no direct effect on Puerto Rican economic activities. Only fluctuations in plants actually opened will have a direct impact on island economic indicators.

(6) H. C. Barton, «Background Data for Program Conference on Industrial Development,» July 16, 1957 (unpublished).

greatest number of discontinuances occurred in textiles, especially apparel. Of the latter, Barton writes that «changes in output are, to a considerable extent, the result of openings and closings of entire plants. This is generally true in industries where capital per worker is low and where individual plants are small in relation to the total size of the industry. Also expansion or closing plans are not made as far in advance as they are in more heavily capitalized industries». (7) It is true that quite a number of plants close for reasons other than marketing difficulties arising from a Mainland recession — reasons such as managerial difficulties, costs higher than at first estimated, labor costs too high in relation to productivity, etc.; nevertheless, the increased number of plant closings in times of recession can mostly be attributed to that recession. For example, in a closed plant survey made by the Economic Development Administration, various reasons for the closing of each plant surveyed were listed, and the three most essential reasons were graded: U (underlying cause), C (contributing cause), and P (proximate cause). In 1952, eight of thirteen plants listing «marketing» as a principal reason for closing chose it as the «underlying» cause; in 1953, there were 7 U out of ten, and in 1954, 14 U out of 16. (8)

Although there are no monthly or quarterly data available of Puerto Rico's GNP, investment and balance of payments items, decreases in new plants opened, and smaller exports were reflected in annual national accounts. The gross product, which had increased by almost $ 80 million from the fiscal year 1952 to 1953, increased by $ 28 million in the following year, and by $ 35 million in 1954 to 1955; investment declined from an increase of $ 9 million in 1952-53 to $ 4 million in 1953-54, but recovered substantially in the following year and long-term capital inflow declined from $ 83 million in 1953-54 to $ 64 million in the following year. The latter rose to $ 73 million in 1955-56, and $ 152 million in 1956-57. Here we obviously have the lag that appeared in the openings of new plants.

Effects on Employment

The brunt of the unemployment which the recession brought along was felt on the Mainland in the first three quarters of 1954

(7) *Ibid.*

(8) «Closed Plants Survey, 1947-54,» (Economic Development Administration, Office of Economic Research, San Juan, Puerto Rico). (Mimeographed.)

TABLE 14

EMPLOYMENT, UNEMPLOYMENT AND MIGRATION, 1953-5
(Seasonally Unadjusted)

a) *Total* (Percentages)

	U. S. Unemployment	P. R. Unemployment	Net Migration ('000s)
1953			
1	2.8	19.2	
2	2.3	10.0	—69.1
3	2.1	12.4	
4	2.8	15.8	
1954			
1	5.3	18.4	
2	5.2	11.4	—21.5
3	5.0	14.4	
4	4.4	17.3	
1955			
1	5.2	19.1	
2	4.1	10.4	—45.5
3	3.4	13.6	
4	3.3	14.2	

SOURCE: U. S. Dep't of Commerce, *Business Statistics, 1957;* P. R. Dep't of Labor, Bureau of Labor Statistics, *Employment and Unemployment in Puerto Rico,* (series).

b) *Selected Industries* (Employment in '000s)

	Food & Kindred Products		Textile Mill Products		Apparel & Related Products		Paper & Allied Products		Chemicals & Allied Products	
	Total Employment	Average Weekly Hrs.	T. E.	Hrs.	T. E.	Hrs.	T. E.	Hrs.	T. E.	Hrs
1953										
1	18.5	37.8	3.3	39.1	15.1	34.1	1.7	43.2	1.3	30.9
2	19.7	37.1	3.1	39.2	16.0	34.3	1.7	42.7	1.4	36.0
3	13.7	34.7	3.5	38.7	16.9	33.7	1.8	40.9	1.4	35.8
4	13.8	35.3			17.7	33.1	1.8	40.3	1.2	32.4
1954										
1	18.4	36.6	3.5	38.1	17.8	34.6	1.8	40.8	1.3	33.1
2	20.0	36.9	3.0	35.6	17.1	35.9	1.7	40.1	1.5	34.6
3	13.3	34.5	3.1	37.6	16.2	34.2	1.7	40.4	1.4	33.2
4	14.2	34.5	3.4	37.3	17.2	33.8	1.8	40.5	1.3	32.4
1955										
1	18.4	37.5	3.3	36.5	16.5	33.6	1.9	39.9	1.4	32.0
2	15.5	34.0	3.6	36.8	17.5	32.5	1.8	41.2	1.5	35.9
3	13.3	35.1	3.6	37.8	17.4	33.8	1.9	41.5	1.7	33.8
4	13.6	34.9	4.1	38.6	18.9	34.0	2.0	40.7	1.6	34.2

TABLE 14 (continued)

b) *Selected Industries* (Employment in '000s)

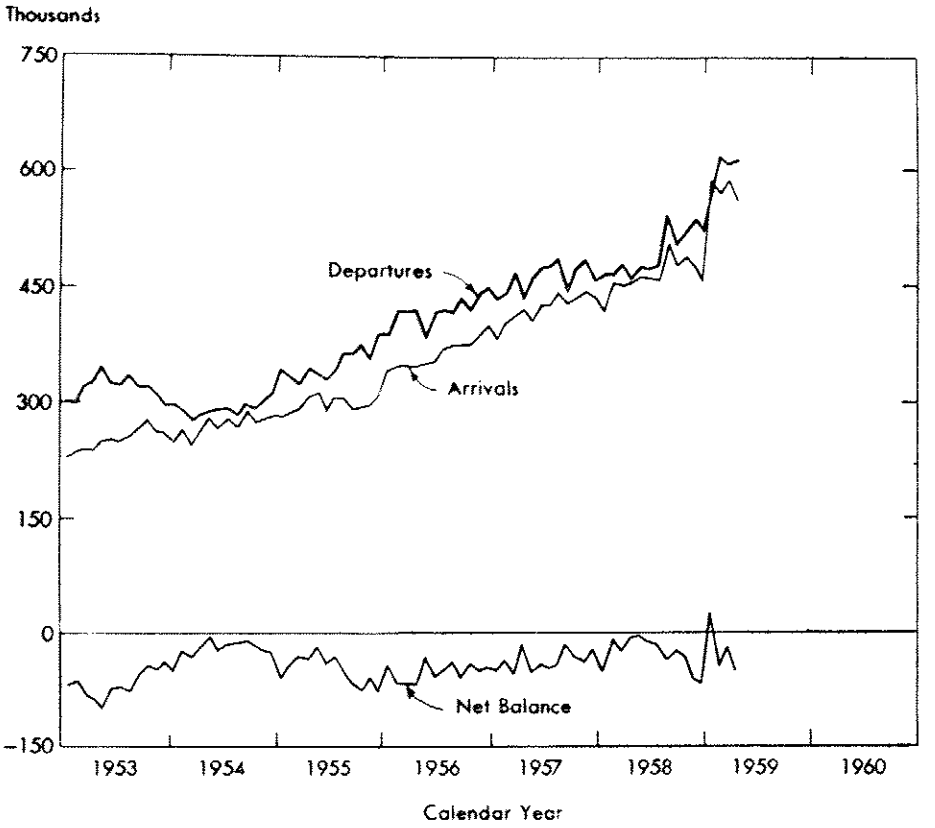
	Lumber & Wood Products		Stone, Clay & Glass Products		Metal Products		Leather Products	
	Total Employment	Average Weekly Hrs.	T. E.	Hrs	T. E.	Hrs	T. E.	Hrs
1953								
1	2.9	38.4	2.9	40.2	2.6	39.2	1.8	35.6
2	3.0	38.2	3.0	40.8	3.0	38.8	2.1	34.6
3	2.9	38.7	3.2	39.2	3.3	38.5	2.2	35.4
4	3.1	38.6	3.2	38.9	3.9	38.9	2.1	35.4
1954								
1	2.8	37.3	2.9	38.6	3.9	38.2	1.8	36.0
2	2.7	37.6	2.9	36.9	3.8	38.1	1.7	33.7
3	2.6	39.1	2.9	37.7	3.7	39.5	1.6	37.0
4	3.0	38.7	2.9	37.7	4.2	39.6	1.7	37.6
1955								
1	2.9	37.0	3.0	38.3	4.3	38.8	1.8	36.1
2	2.9	36.4	3.3	39.1	4.4	38.3	2.2	35.9
3	2.9	37.8	3.6	40.1	4.6	39.1	2.2	35.7
4	3.2	39.1	3.9	39.5	4.7	38.6	2.3	35.6

SOURCE: P. R. Bureau of Labor Statistics, Dep't of Labor, *Employment, Hours and Earnings in the Manufacturing Industries of Puerto Rico*, (series)

when unemployment was generally between 2.5 % and 3 % above the average of the previous year, hovering around 5% (See Table 14). Unemployment in Puerto Rico, which at the time still varied between 19% and 10% during the year, reflected the impact of the Mainland recession in the last three quarters of 1954, reaching a peak in the third quarter. The rates above «normal» unemployment were a little smaller than on the Mainland, varying between 1.5 % and 2 %. An important factor contributing to the rise of Puerto Rican unemployment was the decline in net emigration from 69 thousand in 1953 to 21 thousand in 1954. There was no lag in the net emigration. It began to drop off sharply in the second quarter of 1953, the beginning of the Mainland downturn, and there was no real pick-up again until the last quarter 1954, the beginning of the Mainland recovery. This simply reflects the acute sensitivity of migration to Mainland business conditions — Puerto Ricans being among the first to lose their jobs in a dowuturn, but with the type of work they do, finding it easy to re-enter the job market in an upturn. That a decrease in net emigration

CHART 1

SEASONALLY ADJUSTED MIGRATION (ANNUAL RATES)
CALENDAR YEARS 1953-1960



Source: *Current Business Statistics*, Bureau of Economics and Statistics, Puerto Rico Planning Board.

should contribute substantially to an increase in unemployment during a mainland recession should be clear when one recalls that employment in the declining agricultural sector is decreasing faster than the growing industrial sector can employ them, and that total unemployment can be kept from rising or can be decreased only by a substantial emigration. Not only was there a great drop in the net outflow of workers in 1954, as revealed by statistics in Table 14, but the drop was even greater because in 1954, according to a government publication, «most of the net outward movement of population is attributed to women and to children under labor force age. Thus only 8 per cent of the excess of departures over arrivals was attributable to men of labor force age». (9). In addition, the ranks of the unemployed were also supplied by an increasing amount of discharges from the army. Between the outbreak of the Korean war and early 1954, inductions and enlistments in the armed forces exceeded discharges by 44 thousand. This meant that the army absorbed potential and actual members of the labor force at the rate of almost 1.000 per month. But in the period from March to October, 1954 «the number of discharges from the armed forces exceeded inductions and reenlistments by over 9.000, thus increasing the number of entries into the labor force». (10).

The contribution of the manufacturing sector, and especially of the chief export industries, to unemployment was slight. (See Table 14, section b.). The greatest decline took place in apparel products; it amounted to about 1.500 workers between the last quarter of 1953 and the third quarter of 1954 (while hours worked increased). In most industries there was a decrease in the rate of increase of employed workers rather than absolute declines.

It would seem that the chief contributions to unemployment came from the Home Needlework industry, which has been a continuously declining industry, where employment dropped by over 5,000 between 1953 and 1954, and the construction industry, where employment declined by 6,600 in the same period. (See Table 15.) The latter had nothing to do with the Mainland recession, since private construction activities actually increased between 1953 and 1954 by over $10 million. It was public construction which declined by over $6 million, due to a reduction

(9) «External Passenger Movement,» *Current Business Statistics* (Puerto Rico Planning Board, Bureau of Economics and Statistics), October, 1955.

(10) *Economic Report to the Governor, 1954* (Puerto Rico Planning Board, Bureau of Economics and Statistics).

TABLE 15

LABOR FORCE AND EMPLOYMENT BY INDUSTRY
(in thousands)

	1952	1953	1954	1955	1956
All Industries	571.1	550.0	539.5	539.3	557.7
Agriculture	190.2	170.1	171.8	162.4	159.5
Forestry and Fishing	2.0	1.8	1.7	1.3	1.6
Manufacturing	56.9	62.7	66.8	66.2	74.4
Home Needlework	33.6	36.7	31.2	28.7	25.0
Mining	1.7	2.7	2.1	1.5	1.3
Construction	33.3	38.5	31.9	34.0	37.6

SOURCE: *Economic Report to the Governor, 1956*, Puerto Rico Planning Board, Bureau of Economics and Statistics.

in total construction expenditures of the Housing Authorities and the completion of several other public projects.

The Commonwealth government engaged in no apparent countercyclical fiscal policy. Revenues from taxes met regular government expenditures, and the net debt continued to increase at about the same rate as in the past, the receipts from the sale of bonds going to capital improvement projects. (11). Puerto Rico has a strong instrument for counter-cyclical policy with its high credit rating on the Mainland, and its low debt to annual revenue ratio. With low interest rates usually prevailing on the Mainland capital markets during a recession, it would be easy and cheap for the government to engage in increased borrowing for stepped-up public works.

Conclusion

The effects of the 1953-54 Mainland recession on Puerto Rico were very mild. The principal channel through which it spread was a substantial decline in net emigration, causing a rise in unemployment. Most manufacturing industries which rely to a

(11) In 1954 the Commonwealth and municipal debt of Puerto Rico was small relative to the means available to secure the means for servicing. The total debt was only 21% of annual revenues, and 3.5% of net income. This is one of the lowest ratios of public debt to annual government receipts in the world. (See *Economic Report to the Governor, 1954*, p. 21.)

large extent on exports were hardly affected by declines in exports which took place with a lag of approximately nine months. This can be explained by the backlog of newly promoted firms which were opening their plants in 1954 and thus contributing to total exports and general employment in the respective industries. The sharpest decline in employment took place in the needlework industry, but this was due to a long-established declining trend, and in public construction. The principal effect was thus a mild decline in the rate of growth of the economy.

The 1957-58 Recession

Causes and Characteristics of the Mainland Recession

The recession of 1957-58 lasted nine months, starting with a peak in the second quarter of 1957, and reaching a trough in the first quarter of 1958. Although it was shorter than the previous recession, it was in many ways a sharper setback for the economy. GNP, gross private investment, and industrial production declined more both in absolute and relative terms; inventory liquidation was greater and unemployment was higher than in 1953-54. (Compare data in Table 16 to that in Table 12.) The downturn of 1957-58 originated in changes in a number of sectors «developing at the same time mainly by coincidence... Each exerted a growing downward pressure on production and employment, and ultimately their joint effect was to tip the balance... toward a general reduction in economic activity» [12].

First of all, there was a drastic decline in investment activities (gross private investment fell by $ 16 billion from peak to trough compared to $ 7 billion in 1953-54), which can be attributed to a much faster growth of capacity than its utilization. For example, in manufacturing, expenditures on new plant and equipment between 1953 and 1957 had increased capacity by about 25%, but production had risen by only 7%. In the same period the cost of new capacity had risen substantially more than prices of industrial output, and in 1957 the financing of expansion programs was becoming more costly (while corporate liquidity was very low). [13]. Secondly, there were some sharp reductions in U. S. exports. This was partially a reaction to the

(12) *Economic Report of the President, 1959*, p. 10.

(13) *Ibid.*, p. 12. Most of what follows on the U. S. recession is based on information contained in the President's *Report*.

high volume of exports in the latter part of 1956 and early 1957 to which the Suez crisis had given impetus. The rising volume of exports spurred on by the crisis actually contributed to the maintenance of an upward trend in the economy at a time when investment demand was already leveling off. But the disappearance of the special Suez situation coincided with actual decreases in investment activity, and the volume of exports decreased by 20% during the contraction. Although the initial export decline was due to smaller exports in wheat, cotton, and petroleum, it soon spread to metals, machinery and manufactured goods, reflecting a slackening in the expansion of European countries and their build-up of large stocks.

A third contributary factor to the recession was a curtailment of expenditures on consumer durables of 11% (much larger than in 1953-54), four-fifths of the decline being accounted for by reduced purchases of automobiles. This is remarkable not because cuts in consumer purchases are unusual in a recession, «but the 1957-58 decline was unusually large in view of the small reduction — about one per cent — in the amount of income available to consumers after payment of taxes. (14) Finally, there was a slight reduction in the purchases of the Federal government.

These principally independent changes in demand had a magnified reaction on the economy because of the induced changes in the inventory policies of businesses. There had been a considerable increase in inventories from 1955 until the middle of 1957. In the third quarter, with uncertainties about future sales and with increased difficulties and costs of financing inventories, the rate of accumulation slackened, and by the last quarter of 1957 actual inventory reduction began and reached peak in the first quarter of 1958 when, the rate of reduction rose to 8.2 billion dollars per year. And thus, «a moderate decline in the pace of actual sales produced a much larger effect on production and employment by provoking a sharp swing from inventory accumulation to inventory liquidation». (15). Over half of the decline was concentrated in the machinery, aircraft, and automobile industries, but substantial cuts were also made in the petroleum, chemical, paper, and consumer household durable goods industries. Although inventory liquidation was the induced factor in this recession, it ultimately accounted for about 60% of the entire decline in GNP.

(14) *Ibid.*, p. 13.
(15) *Ibid.*, p. 14.

The maintenance of over-all consumer demand seems to have been a principal factor in accounting for the short duration of the recession and its relatively small impact in the face of sharp inventory and investment curtailments. Although GNP fell by 20 billion dollars on an annual rate from the third quarter of 1957 to the first quarter of 1958, personal income declined by less tham 4 billion dollars and aggregate consumer expenditures by less than 2 billion dollars. The small decline in personal income is accounted for mainly by a decline in earned personal income which is small relative to the decline in production, (16) an increase of transfer payments, and a reduction in personal tax payments. Also, consumers, in their turn, reduced their purchases of goods and services by an amount smaller than their fall in income.

The slight fall in the sales of consumer non-durable goods, the continued expansion of service industries, the continued rise in expenditures of local and state governments, and the rising earnings of the labor force still employed, all contributed to an early halt in the downturn. By the spring of 1958, Federal government expenditures began to rise again, the decline in business expenditures on plant and equipment came to an end, and there was a considerable expansion in home building activities. Inventory liquidation continued, however, but at a diminished rate, until the last quarter of 1958. The recovery was underway in the second quarter of 1958, but at a sluggish rate. It continued throughout the year and picked up speed in the last quarter.

Effects of the Recession on Puerto Rico

The impact of the recession on Puerto Rican exports seems to have been rather slight. When taking account of seasonal factors, it would seem that the principal effect was in a slackening of the rate of growth of total exports during 1958. (See Table 16.) A more detailed glance at individual export items, some of which are reproduced in Table 17, leaves the impression that

(16) For every decline of $1 billion in private output, personal income earned fell only $360 million; in 1929-30, it fell $670 million. According to the President's economic advisors, this can be explained by «the fact that a larger proportion of our labor force is now employed in industries and occupations not quickly affected by moderate changes in business conditions; and even in industries that are more sensitive to business fluctuations, a larger proportion of employees hold positions not usually affected by production cutbacks of short duration.» *Ibid.*, p. 15.

TABLE 16

THE RECESSION OF 1957-58 — COMPARATIVE DATA

U. S. Data (Billions of dollars) *

	GNP	Consumption Non Durable	Consumption Durable	Gross Private Investment	Changes in Business Inventories	Index of Industrial Production
1957						
1	429.9	35.9	137.3	63.6	.0	146
2	441.2	39.5	137.1	67.0	2.9	144
3	445.6	40.4	140.5	66.7	2.2	142
4	438.9	39.6	138.8	61.5	—2.2	141
1958						
1	427.1	36.3	139.8	50.9	—8.2	130
2	434.5	36.7	141.5	51.3	—5.8	128
3	444.4	37.1	143.1	54.2	—3.4	133
4	457.1	39.8	143.6	61.3	.8	142
1959						
1	470.2	41.3	145.3	69.8	6.1	146
2						153

Puerto Rican Data (millions of dollars) **

	Total Exports	Total Imports	Unemployment	New Plants	Plants Discontinuing Operations	Index of Industrial Production (1952-54 = 100) Total	Non-Durable	Durable
1957								
1	90.4	172.5	15.7	30	5	186.2	183.6	193.1
2	111.4	161.9	10.0	23	3	225.2	215.6	249.9
3	122.9	131.9	12.8	28	4	216.0	209.0	234.0
4	105.5	174.2	13.1	31	6	230.3	224.1	246.2
1958								
1	91.6	161.6	14.9	25		221.0	215.6	234.9
2	122.9	151.7	10.5	20		245.6	233.7	276.4
3	125.4	150.1	13.7	32		252.4	249.4	260.4
4	111.8	165.3	16.6	22				
1959								
1	111.6	174.9	15.9	30				
2			10.6					

* Seasonally adjusted, except Index of Industrial Production.

** No seasonable adjustment.

SOURCE: See Table 12.

TABLE 17

a) U. S. INDUSTRIAL PRODUCTION AND PUERTO RICAN EXPORTS (1957-58)

	Fabricated Metal Products		Non-Electrical Machinery	Electrical Machinery	Machinery & Vehicles	Textile Mill Products	Apparel	Textiles (Total)	Paper & Allied Products	
	U. S.	P. R.	U. S.	U. S.	P. R.	U. S.	U. S.	P. R	U. S.	P. R
1957										
1	137	1.4	159	208	8.5	104	118	28.6	160	1.5
2	138	1.7	155	193	8.7	100	112	29.0	160	1.5
3	140	1.5	146	205	9.6	96	107	30.3	156	1.5
4	137	1.8	141	209	10.2	96	105	31.9	158	.9
1958										
1	124	2.0	132	182	7.0	94	109	26.3	155	.4
2	120	2.6	124	162	8.6	94	106	25.4	156	.4
3	132	3.6	122	180	10.1	97	110	32.1	160	.6
4	136	3.7	130	194	16.5	105	114	33.2	168	1.3
1959										
1	136	2.6	141	199	10.4	111	126	28.3	173	1.1
2	146		152	202		(118)	(127)		(183)	

	Chemicals		Veg. Food & Beverages		b) SELECTED P. R. IMPORTS					
					Non-Met. Minerals	Textile Fibers & Mfgs.	Vegetable Food Prod's & Beverages	Animal & Animal Products	Machinery & Vehicles	Chemicals & Rel Products
	U.S	P.R.	U.S.	P.R.						
1957										
1	185	1.5	103	22.1	8.5	25.2	27.8	18.0	32.4	12.2
2	182	1.3	109	38.4	7.3	25.6	23.4	14.7	34.4	12.9
3	180	1.6	122	41.8	7.3	21.7	18.1	15.4	24.1	1.07
4	187	2.7	115	23.4	5.7	19.6	25.0	17.0	31.9	12.7
1958										
1	181	1.9	104	19.3	7.1	26.0	22.4	17.8	31.1	13.1
2	178	1.6	111	44.9	4.5	24.2	21.3	16.3	31.6	13.3
3	181	1.8	125	38.3	5.7	22.7	21.4	18.0	27.9	13.6
4	195	1.2	119	16.6	5.3	27.2	22.9	16.7	33.6	11.1
1959										
1	201	1.2	108	27.5	6.2	27.7	24.0	19.1	36.3	14.1
2	(207)		(115)							

SOURCE: See Table 12.

they did not follow their industrial production counterpart on the Mainland. While there was a substantial cut in the production of fabricated metal products, Puerto Rican exports continued to rise throughout the period; much of this can be explained by the high rate of opening of new firms in that industry during the first three quarters of 1958. A sharp drop in the production of *machinery* products on the Mainland was reflected in a relatively mild decrease in export of those products from the island in the first quarter of 1958. The decline in the production of *textile* products, which was somewhat smaller than the general decline of industrial production, had a definite effect on Puerto Rican textile exports which slumped in the first two quarters of 1958 to a proportionately larger extent. In this case the explanation must lie with a substantial curtailment of production of some plants, since the rate of openings of new plants did not drop to any marked extent in that period. *Paper and Allied Products*, which experienced only a very small drop in Mainland production, took a relatively sharp drop in exports in the first half of 1958, declining by more than fifty per cent. *Chemical* exports declined throughout 1958, despite the relatively small slump in Mainland production.

The effects on employment of the Mainland recession are reproduced in Table 18. Unemployment increased substantially above the seasonal average in the last half of 1958, especially in the fourth quarter. At its height, the recession-induced unemployment was higher than in 1953-54, but this was also the case on the Mainland. A glance at individual industries in part b) of the Table reveals a noticeable decrease in employment in the Textile Mill Products and Apparel industries; they reached their low points in the first and second quarter of 1958 respectively, but recovery was slow throughout the rest of the year, though weekly hours worked increased rapidly and were above the 1957 average throughout the latter part of 1958. It seems that as production expanded again, firms were slow in their re-hiring policies, preferring to extend hours worked of employees still on the job; and also that new firms preferred hiring fewer workers, but for longer hours. The steady rate of employment in the Paper industry, in spite of the slump in exports, is explainable by the lack of comparability — i. e., employment figures include workers in the printing industry —and also by the fact that close to 70 % of this industry's output is sold domestically. The prolonged slump in chemical product exports is paralleled by a slump in employment in that industry,

TABLE 18

EMPLOYMENT, UNEMPLOYMENT AND MIGRATION, 1957-58
(Seasonally Unadjusted)

a) *Total* (Percentages)

	U. S. Unemployment	P. R. Unemployment	Net Migration ('000s)	Seas. Adjusted Yearly Rates
1957				
1	4.6	15.7	—77	—59
2	4.1	10.0	—139	—25
3	3.9	12.8	—53	—35
4	4.5	13.1	+118	—32
1958				
1	7.4	14.9	—64	—32
2	7.4	10.5	—105	—5
3	6.7	13.7	—41	—25
4	5.7	16.6	+99	—67
1959				
1	6.8	15.9		(—40)
2	5.3	10.6		

SOURCE: See Table 14a.

b) *Selected Industries*

	Food & Kindred Products		Textile Mill Products		Apparel & Related Products		Paper & Allied Products		Chemicals & Allied Products	
	Total Employment	Average Weekly Hrs.	T. E.	Hrs.	T. E.	Hrs.	T. E.	Hrs.	T. E.	Hrs
1957										
1	17.1	36.8	4.4	34.6	19.1	32.7	2.0	40.1	2.3	35.3
2	18.4	36.4	5.1	38.7	18.2	33.1	1.9	40.6	2.6	37.6
3	13.4	35.6	5.1	35.2	18.7	33.7	2.0	41.1	1.4	33.7
4	14.0	35.3	4.8	35.8	18.9	33.3	2.1	40.5	1.3	35.1
1958										
1	17.1	37.4	4.2	33.3	18.0	32.5	2.0	39.9	1.3	33.4
2	19.0	37.6	4.3	35.5	16.8	32.0	2.0	40.6	1.4	36.0
3	13.7	35.8	4.8	37.0	17.1	33.9	2.1	40.2	1.5	36.1
4	14.8	35.1	4.8	36.7	17.9	34.1	2.1	40.7	1.4	33.3
1959										
1	18.8	38.0	4.8	36.0	17.7	33.9	2.3	40.0	1.4	34.9
2										

TABLE 18 (continued)

b) *Selected Industries* (continued)

	Lumber & Wood Products		Stone, Clay & Glass Products		Metal Products		Leather Products		Petroleum	
	Total Employment	Average Weekly Hrs.	T. E.	Hrs	T. E.	Hrs.	T. E	Hrs.	T. E.	Hrs.
1957										
1	3.2	38.0	4.2	38.2			2.3	37.0		
2	3.3		4.1				2.4			
3	3.0	37.0	3.7	38.0	1.4	37.6	2.3	37.3	2.0	38.7
4	3.3	38.7	4.3	38.5	1.6	38.3	2.5	37.2	2.1	39.6
1958										
1	3.2	37.4	4.1	37.1	1.7	37.7	2.5	36.3	2.1	38.4
2	3.1	36.7	3.8	36.7	1.8	37.8	2.6	37.1	2.1	38.6
3	3.0	37.6	3.8	37.0	1.9	37.9	2.8	38.4	2.2	39.5
4	3.2	38.6	3.9	36.9	1.9	37.8	2.8	36.1	2.0	38.8
1959										
1	3.2		3.9		1.9		2.9		2.0	
2										

	Machinery (Except Electrical)		Electrical Machinery		Professional & Scientific Equipment		Metal Products & Machinery (Incl. Electrical)	
	T. E	Hrs	T. E.	Hrs.	T. E	Hrs.	T. H	Hrs.
1957								
1							5.8	37.5
2							5.8	38.3
3	1.4	35.2	3.3	39.2	1.4	34.6	6.1	
4	1.4	38.4	3.4	37.2	1.4	36.9	6.4	
1958								
1	1.4	38.2	2.9	33.5	1.3	36.0	6.0	
2	1.3	36.2	2.7	34.0	1.2	35.0	5.8	
3	1.4	37.8	2.8	36.5	1.2	35.0	6.1	
4	1.4	37.2	3.0	38.9	1.3	38.8	6.3	
1959								
1	1.4		3.1		1.4			
2								

SOURCE: See Table 14b.

while the continued rise in the exports of metal products is accompanied by a very small rise in employment and hours worked, possibly due to increases in productivity. Finally, the decline in machinery exports was accompanied by a decrease in employment of a relatively mild nature; and a more pronounced decrease in the number of weekly hours worked.

A broader resume of the employment situation is obtained from Table 19. The decline in agricultural employment has continued and its rate was not affected to any degree by the recession (as a matter of fact, it decreased between 1957 and 1958). The rate of increase in manufacturing came temporarily to a halt, while construction declined, and Home Needlework continued its steady decline. The decline in employment between 1956 and 1957, and the small increase in 1958, which contributed substantially to the proportionately much greater rise in unemployment because of the usual decline in emigration and the continued natural growth of the labor force, can be traced to a large extent to the manufacturing sector and especially to the export-oriented industries. Although there does not seem to be any obvious decline in that sector, it should be remembered that Puerto Rico relies on continued and increased growth of manufacturing industries to absorb the labor force released from such declining industries as agriculture and home needlework. Seen in this light, the stoppage of growth in employment in manufacturing, and the actual more than seasonal

TABLE 19

EMPLOYED WORKERS BY INDUSTRY GROUP
(in thousands)

	1956	1957	1958
Agriculture	160	150	149
Manufacturing	74	79	79
Home Needlework	25	20	12
Mining	1	2	2
Construction	38	40	37
Trade	93	94	97
Services	71	67	72
Government	55	57	62
Total	558	552	555

SOURCE: *Economic Report to the Governor, 1958.*

decline which occurred in 1957-58 were important contributory factors of the Mainland recession to the island. This is also evident in a discussion of the employment situation in the 1958 *Economic Report to the Governor*, where it is noted that employment in April 1958, was 5000 less than a year earlier, and that 1.7 thousand of this loss was in EDA-promoted manufacturing plants. It is further claimed, however, that «taking into account the new jobs created by plant openings during the year, it is apparent that employment cutbacks in those EDA firms which were in operation at the outset of the fiscal year, as well as declines resulting from plant closings must have totaled more than 4.0 thousand». (17).

The Mainland recession also made itself felt through a decline in the openings of new plants, but to a lesser extent than in the previous recession. This is surprising in the light of the sharp decreases which occurred in Mainland investment activities. The plant promotion program suffered even less (the recession causing delays in actual plant establishment of promoted firms). The picture which emerges in the expanding sector of the economy is of a small decrease in the number of promotions and a somewhat larger decrease in the number of openings of new plants due to the greater recession-induced lags between promotion and openings. Usually, «two thirds of the plants opening in a given year are promoted in the same year. In 1957-58, less than half of those opened were promoted during the year, the majority being carryovers». (18). The net increase in new plants was much smaller, due to the rise in the number of plants discontinuing operations (almost double the number of closings in the previous year). With 36 closings in the fiscal year 1957-58, and 97 actual openings, the net increase of plants was down to 61.

Decreases in employment in EDA-promoted plants were for the most part concentrated in older plants. The bulk of the decline occurred in plants established prior to 1955 (3.2 thousand), while only a small decline occurred in plants established between 1955 and 1957 (900). Plants established in the first three quarters of 1958 provided employment for 2.5 thousand workers, while employment losses due to closings in the same period (occurring in random fashion among firms in all age groups) amounted to 1.9 thousand workers. It seems that this

(17) *Economic Report to the Governor*, 1958, p. 19.

(18) *Ibid.*, p. 10.

was a pattern similar to 1953-54, when the bulk of the employment decline occurred in plants established prior to 1951. One explanation offered is the tendency «for newly established firms to gradually hire more workers during their first few years of operation than are eventually needed to maintain capacity output levels after peak productivity has been reached». (19)

Behavior of Imports

There occurred a much stronger decline in total imports during the 1957-58 period than during the previous recession, and as in the previous recession it took place without a lag. Much of the decline was concentrated in textiles and machinery. Machinery had not declined at all in 1953-54, whereas in 1957-58 it accounted for one third of the decrease in imports which took place between the second and third quarter of 1957, obviously reflecting a decrease in investment activities on the island.

The 1957-58 recession thus revealed a pattern not discernable previously. There was a stronger cutback in the operation of existing firms than in the previous cycle, which was not offset by continued vigorous expansion of new firms. This leads one to conclude tentatively that the present industrial structure of Puerto Rico is increasingly sensitive to Mainland fluctuations and that a vigorous underlying growth factor would be required as an immunizing agent; and this sensitivity might become even greater as industrialization continues and as a larger percentage of firms come to be three-years-old or more.

The lagged relationship between Mainland and Puerto Rican economic fluctuations which appeared in 1953-54 seems to have been considerably reduced. For example, the slack in openings of new firms became obvious in the first quarter of 1958, two quarters after the beginning of the Mainland recession. This was also true in the behavior of individual industries (see Table 17): declines in exports became noticeable in the first quarter of 1958, about six months after Mainland industrial production began its decline, and the trough was reached in most cases after the same lag. It is difficult at this stage to advance any definite reason for the shorter lag. The *Economic Report to the Governor* attributes it to «the greater sharpness in 1957-58 of inventory liquidation and of reduction in plant and equipment

(19) *Ibid.*, pp. 10-11.

expenditures in the United States. Another reason in the increased role in the Puerto Rican economy of investments from the Mainland and of Mainland markets for local products.» (20). But one fails to see factors which should necessarily account for shorter lags. Possibly the greater sharpness induces investors to postpone plans sooner or affects Mainland customers' decision to curtail orders sooner. Possibly also the structure of the Puerto Rican economy has changed to the extent that a smaller number of firms operate on a contractual basis with Mainland customers and thus are hit by fluctuations in the market sooner than before.

Migration

Just as in the previous recession, there occurred a sharp decline in net emigration. The decline, however, was not as abrupt and as prolonged as in 1953-54. (See Chart I.) The bulk of the decrease was concentrated in the first half of 1958. The general impression which Chart I gives is of a softening in the impact which the Mainland recession had on net emigration, especially when one considers the shortness of the dip. This could possibly be attributed to greater long-run job security and opportunity which Puerto Ricans on the Mainland find, especially after having been there for over a decade — and hence a lower re-immigration of the jobless. Also, the 1958 dip was attributed principally to female migrants, who are less often to be found in the labor force. Thus the impact on the Puerto Rican labor force was much less severe than it might have been, and a much smaller proportion of the rise in unemployment could be attributed to the migration factor than in the previous recession. It should also be remembered from our description of the characteristics of the Mainland recession that its impact was much less severe, or even absent, in the services industries and non-durable goods sectors which employ a large number of Puerto Ricans.

Actions of the Commonwealth Government

As in the 1953-54 period, the Commonwealth government did not pursue any consciously anti-deflationary fiscal policy, although its budget turned out to be of such a nature. From 1957

(20) *Ibid.*, p. 6

to 1958 total government receipts (excluding the sums borrowed) increased from $ 198 million to $ 204 million, a relatively small increase compared to previous years, while expenditures increased from $ 231 million to $ 248 million. Most of the increase is attributed to increases in operating expenses, rather than for capital purposes, which remained constant. There was, however, a considerable increase in expenditures for economic development; i.e., for industrial and agricultural development transportation and communication, and rural electrification — this amounted to $ 10 million in all, and thus increased the proportional share of this type of expenditure in the total budget from 17% to 20%. The entire expenditure for capital programs was financed from the sale of bonds and the drawing down of cash balances. The net debt of the island rose from $ 49 million in June, 1957 to $ 61 million in June, 1958. The debt limit, which amounts to ten per cent of the assessed value of property at the end of fiscal year rose from $ 116 million to $ 158 million, thus leaving ample room for further deficit financing. But, as was mentioned above, the budget was never consciously used as an instrument of business cycle policy

Conclusion

The 1957-58 recession, which was more severe but shorter than the previous one, had on the whole a relatively mild effect on Puerto Rico. The island gross product continued to grow, though at a rate smaller than projected without the recession (i. e., growth in current values of 6.8 instead of a potential 10%—13%). Gross domestic fixed investment, which had increased by $ 51 million in 1956-57, rose by only $ 11 million in the following year. This was especially influenced by private investment in machinery and equipment which increased by $ 22 million in 1956-57, and decreased by $ 3 million in 1957-58. Much of this decrease in private investment was due to a slowdown in new plant openings, which was reflected in balance of payments figures by a decline in the inflow of long-term capital, which had increased by $ 80 million in 1956-57 (from $ 72 million to $ 152 million), and which decreased by $ 3 million in 1957-58 to $ 149 million.

There was an induced effect on unemployment, but unlike the 1953-54 experience, when the principal channel through which

the effect was propagated was the slump in net emigration, the principal causative factor in 1957-58 was a widespread curtailment of production of long-established export-oriented industries. Although the decrease in the number of openings of new firms was not too drastic, the net increase in employment resulting from the opening of industrial plants was not enough to counteract the effects of the recession on older firms.

PART II

THE BEHAVIOR OF PUERTO RICAN FINANCIAL INSTITUTIONS OVER THE CYCLE

Some General Observations

In a study which is primarily concerned with interregional economic relationships, monetary relations should not be neglected since they form an integral link in the chain that binds regions into a national economic unit. In the case of Puerto Rico, monetary relations with the Mainland are not necessarily the principal element explaining the basic nature of interactions between the island and the Mainland. They are, however, the links through which fluctuations are passed on, and, in some cases, through which induced fluctuations are magnified or dampened.

The simplest approach is to view monetary relationships through the balance of payments of Puerto Rico with the Mainland. This presents the characteristic situation of a regional as opposed to an international payments system, where the region, unlike the country, does not have at its disposal the power to change the value of its currency, to restrict payments to impose quantitative restrictions on trade, etc., in order to adjust the payments to its liking. The outcome of this is «either continuance of free movements and a nondepreciated dollar or a complete cessation of payments and a disguised depreciation.» (21)

(21) Seymour E. Harris, *International and Interregional Economics* (New York: 1957), p. 176.

Actually one never hears about inter-regional balance of payments difficulties due to the equilibrating flows of capital between regions of the same country. For example, a booming region which imports more than it exports to other regions will receive capital from regions experiencing lesser or no growth, and hence an excess of loanable funds. It is even claimed that the flow of capital should more than offset the deficit because the entrepreneurs' demands for funds will exceed the amount needed for plant, equipment, and inventories by the capital (circulating) required in order to operate to the new capacity. (22) In cases where capital does not fill the gap, or where economic stagnation reduces exports at a faster rate than imports, and there is no attraction for autonomous capital movements to make up the gap, adjustment would probably have to take place via contractions in investment, income, imports, and migration; in other words, the mechanism would be parallel to the gold standard adjustment. (23)

A net capital inflow into a region creates magnified repercussions in a decentralized fractional reserve banking system. If the booming region experiences a net capital inflow, banks will become more liquid and the resulting increased loans could further accentuate investment activities, or provide funds for running the new capital equipment, or they might be used for further imports, in which case further expansion of credit will be checked.

The Changing Structure and Importance of the Puerto Rican Banking System

The most impressive change that has taken place in the Puerto Rican banking system is the growth of its importance. While gross product has increased by 50%, and per capita by 69 %, since 1950, demand deposits have increased by 73 % and time and saving deposits by 233 %; and while investment has grown by 82 %, bank loans have increased by 160 %. All this compares quite favorably with the U. S., where bank loans and deposists have increased only 93 % and 29 % respectively in the same period. (24) One principal reason for this phenomenon is

(22) Tibor Scitovsky, *Economic Theory and Western European Integration*, pp. 87-91.

(23) *Ibid.*

(24) *Current Business Statistics* (Bureau of Economics and Statistics, Puerto Rico Planning Board), September, 1958.

that as an area industrializes, as per capita income increases, as the percentage of workers employed in non-agricultural activities increases, greater use will be made of the banking system as a repository of increased savings and a greater use will be made of checking accounts for transaction purposes. Very often the use of currency relative to checking accounts is used as a measure of development. That currency still plays a relatively large role in Puerto Rico can be seen by the fact that while per capita income is about one-fourth of the U. S. per capita income, total bank deposits amount to one-seventh, and private deposits to one-ninth, of those on the Mainland. (25)

There are 11 commercial banks operating in Puerto Rico, with a total of 86 banking offices throughout the island. This is a considerable growth, when one considers that only 38 offices existed in 1945, and 51 in 1950. Although this has been considered to represent a fairly good coverage for an island 100 miles by 35 miles, there are still some areas without banking services. To remedy this situation, a law was passed authorizing «bus banking» or mobile banking units to cover municipalities whose needs do not require full-time banking offices. (26) Basically there are three types of commercial banks which operate on the island: seven locally chartered banks, two branches of New York banks, and two Canadian banks. Of the local banks, three are large and four are relatively small. These local banks account for over 60 % of total assets of half a billion dollars, and for 50 % of total loans made by commercial banks. This represents a considerable degree of expansion for domestic banks when one considers that in 1942 they only controlled 37% and in 1950, 56% of total assets, while their share of private deposits increased from 44% in 1942 to 58% in 1950 to 64% in 1958 (See Table 20). This is not true in the case of loans, their share of which amounted to 47 % of the total in 1942, 54 % in 1950, and 51 % in 1958, which, according to Wallich, reflects the fact that foreign banks tend to bring «head office funds to Puerto Rico instead of exporting Puerto Rican funds to the head office.» (27)

In general terms, the fast growth of banking can obviously be explained by effects of the industrialization program of EDA,

(25) Henry C. Wallich, *Banking Facilities in Puerto Rico*, report to Government Development Bank, September, 27, 1958, p. 3. (Mimeographed.)

(26) John S. DeBeers, «Instruments of the Capital Market in Puerto Rico,» (Government Development Bank for Puerto Rico), June, 1957, p. 6.

(27) Wallich, *op. cit.*, p. 4.

the accompanying increase in capital imports, changes in the banking structure — e. g., the introduction of FDIC, the higher interest rates on savings deposits, etc. Also, the relatively faster growth of domestic banks can be accounted for by their more intimate acquaintance with the economy, which makes the penetration into areas of potential demand for credit easier.

One of the principal functions of the banks and other financial institutions seems to be the fostering of more local financing of capital formation. Up to now the bulk of Puerto Rico's rapid progress was financed by massive inflows of capital. The largest proportion of bank loans is still granted to commerce and industry, and this is followed by loans to individuals; these make up 50% and 20% respectively of total lending. Loans on real estate have been increasing fairly rapidly in recent years, making up 16% in 1958, due to increases in real incomes, the availability of Federal Housing Administration facilities, and the marketability of FHA-insured mortgages in the U. S. (28)

Before we can make any statements as to the behavioral pattern of the banking system in relation to Mainland economic and financial developments, a brief examination of the legal

TABLE 20

GROWTH OF BANKING AND FINANCIAL INSTITUTIONS IN PUERTO RICO
[in millions of dollars]

	1950	1958	% Change
Commercial Banks			
Demand Deposits	107	185	73
Time and Saving Deposits	51	170	233
Government Deposits	84	70	—17
Loans	120	312	160
Investments	97	82	—15
Government Dev. Banks	34.5	62.2	80
Gross Product	753	1.286	59
Per Cap. Inc.	278	469	69
Investment	150	274	82

(28) *Current Business Statistics, op. cit.*, p. III.

SOURCE: *Comparative Financial Conditions of Commercial Banks in Puerto Rico*. Commonwealth of Puerto Rico, Department of the Treasury.

structure of the system is in order. The extension of federal deposit insurance to Puerto Rican institutions in 1950 considerably strengthened the position of locally chartered banks, and partly explains their phenomenal absolute and relative growth A special act of Congress in 1952 required the two national banks to insure their deposits in Puerto Rico with the FDIC. But the Canadian banks, being foreign corporations, are not eligible for membership. (29) Another important factor in bolstering the banking system was the establishment at the request of Puerto Rico of a United States Treasury cash depot on the island in 1952. This assures a ready supply of coin and currency for the community and considerably lessened the need of banks to carry large reserves of vault cash. (30) Since 1952 improvements have been made in modernizing the island's check-clearing mechanism, thus diminishing the size of the «float», the uncollected balances. (31)

A most interesting feature of the Puerto Rican banking system is the reserves of banks. All the commonwealth chartered banks are required by the government to hold minimum legal reserves of 20% against demand liabilities, which have to consist of at least one-third of 20%, i.e., 6 2/3% in vault cash, 3-1/3% in the form of checks on island banks held for collection, and the rest in the form of interbank deposits. Puerto Rico's Commercial Banking Code gives the island's treasurer the power to change minimum reserve requirements (he may raise it up to 30 %). The two Mainland banks fall under the jurisdiction of the Federal Reserve System. The two Canadian banks fall under the jurisdiction of the commonwealth, with the additional requirement that they must keep in Puerto Rico 75 % of their total deposits in either cash, loans, property, or securities of the federal or local government. The Canadian and national banks have recourse to their respective head offices for funds, the latter also having access to the Federal Reserve System. Local banks have established lines of credit with correspondents. (32)

The Puerto Rican banking system has been traditionally concerned with the «excess reserves» problem, which has been diminishing somewhat in the last few years. Reserves in excess of the amount legally prescribed have been traditionally extremely high in Puerto Rico. In the late 1940's they amounted to

(29) Biagio DiVenuti, *Banking Growth in Puerto Rico* (1955), pp. 9-13.

(30) «Puerto's Rico's Monetary System and Economic Growth.» *Monthly Review of Credit and Business Conditions* (Federal Reserve Bank of New York), March, 1953.

(31) See *ibid.*

(32) Di Venuti, *op. cit.*, p. 61.

over 100%; since that time they have been declining steadily, reaching a low of 23 % in the third quarter of 1958, which, however, is still considerably higher than the level in Mainland banks. The reason for traditional excess reserves is that locally chartered banks, not being part of the Federal Reserve System, do not have immediate accesss to a Reserve bank for accomodation in case of unexpected drains on their reserves. The principal function of «excess reserves» then, «is not their role in determining the extent to which banks may expand their loans and investments, and thus the volume of their deposits; rather, their function, in the absence of direct recourse to Federal Reserve facilities, is that of insuring at all times the capacity of these commercial banks to meet the withdrawal of demand of customers» (33). Need for ready access to credit has been especially conspicuous to banks located outside of the metropolitan San Juan area where the United States Treasury's Cash Custody Account is held, hence more reserves are needed for effective day-to-day operations. Another factor, which is of especial importance in the context of this study, for holding excess reserves is «the need of maintaining adequate reserve cushion to absorb the impact in Puerto Rico of any disrupting economic influences originating on the Mainland (34). The implication of these excess reserves is that multiple credit creation of increased deposits is considerably dampened.

There has been a substantial contraction in excess reserves since the early fifties which resulted from the pressure exerted by expanding credit demand that accompanies the industrialization program and all its ramifications. But it has been made possible also by a number of actions taken since 1950 which strengthen Puerto Rico's banking system. There was the extension of Federal Deposit Insurance to Puerto Rican banks in 1950, which tremendously bolstered the confidence in the latter, partially causing a substantial growth in deposits and a more extensive utilization of bank resources. There was also the establishment of the U. S. Treasury cash depot, at Puerto Rico's request, in 1952, which assured a readily available and adequate currency and coin supply; thus the former need of Puerto Rican banks to hold large reserves of vault cash was considerably reduced. Substantial improvements have also been made in streamlining the island's check-clearing mechanism, substantially

(33) DiVenuti, *op. cit.*, p. 63.

(34) *Ibid.*, pp. 64-65.

reducing the volume of the «float», i.e., uncollected balances. By agreement among all banks the Government Development Bank was designated as Settling Agent in the collection of intra-island checks. An important link with the Federal Reserve System was established when the Government Development Bank was allowed to establish a non-member clearing account with the Federal Reserve Bank of New York, a link which facilitates the settlement of balances and their transfer to and from the Puerto Rican banks' correspondents in New York (35).

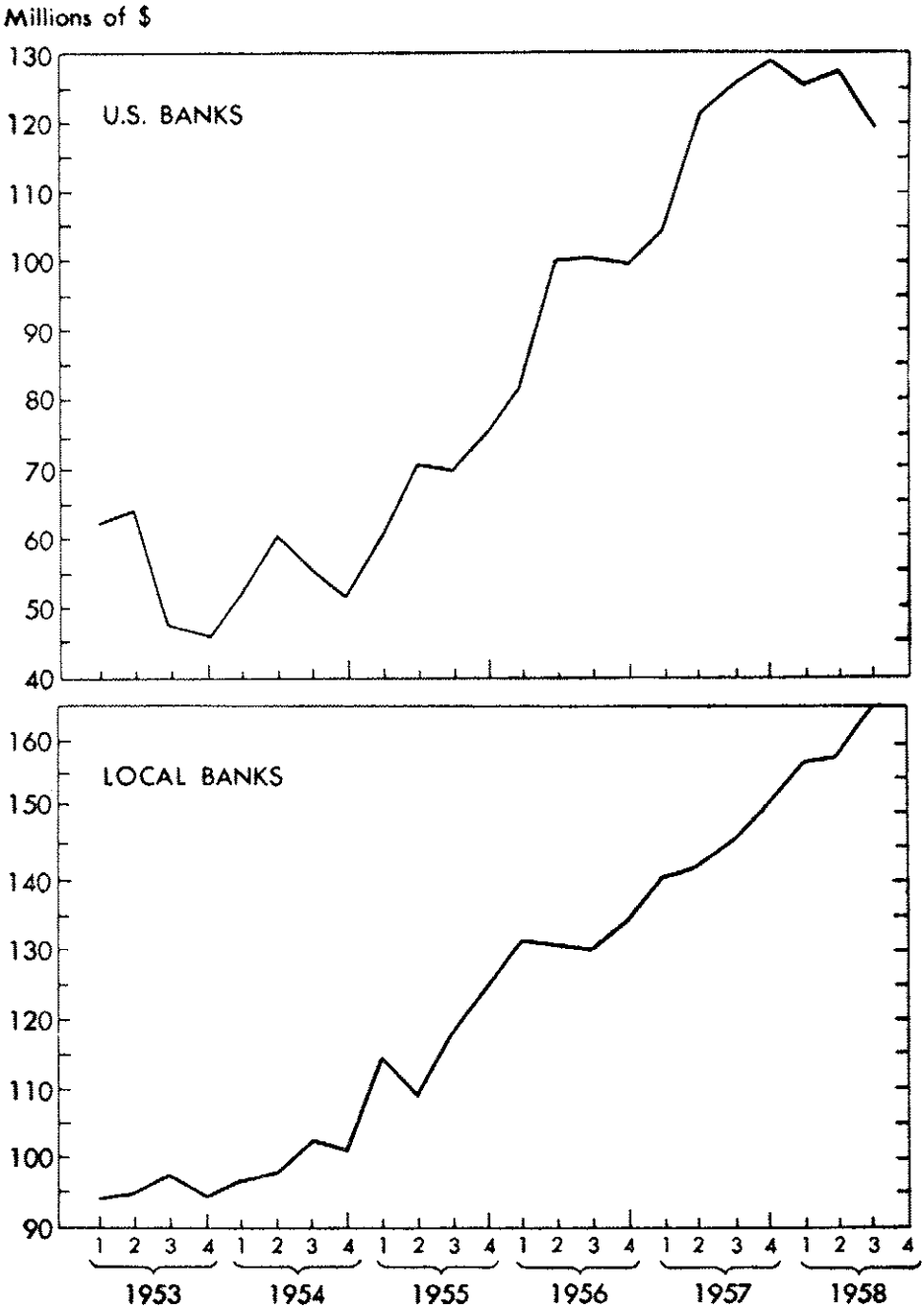
Finally, on January 1, 1958, Puerto Rico became part of the second Federal Reserve District for purposes of check collection. This step was taken in conjunction with the establishment of par clearance of checks by Puerto Rican banks. It should enhance the mobility of funds between the Mainland and the island.

All these institutional changes do much to explain the steady and considerable reduction which has taken place in the holding of excess reserves, the stepped-up activities in lending of the banking system, and the rapid growth of deposits, especially savings deposits.

An examination of quarterly banking statistics from 1953 to 1958 leaves the impression that financial channels are not one of the principal connections to the mainland through which economic fluctuations are passed on, and, as a matter of fact, it would seem that they are hardly affected by Mainland fluctuations. Total private deposits, which are reproduced on Chart II, have been rising steadily without an interruption. Only in 1958 does there appear to be a decline in the rate of growth, attributable principally to decreases in the demand deposits in U. S. banks.

There appears to be some reactions to Mainland conditions in total loans made by banks (see Chart III), and this is mainly attributable to Mainland subsidiary banks, which curtailed their lending activities in 1953-54 and again in 1957-58, while locally-chartered banks continued to expand their loans steadily throughout those periods. Part of the explanation might lie in the fact that Mainland corporations which curtail some of their operations during a Mainland recession borrow funds for operations from U. S. banks rather than from locally-chartered banks. Furthermore, considering the high excess reserve position of banks, especially local banks, which institutional changes have rendered obsolete, and the increasing use of the credit system

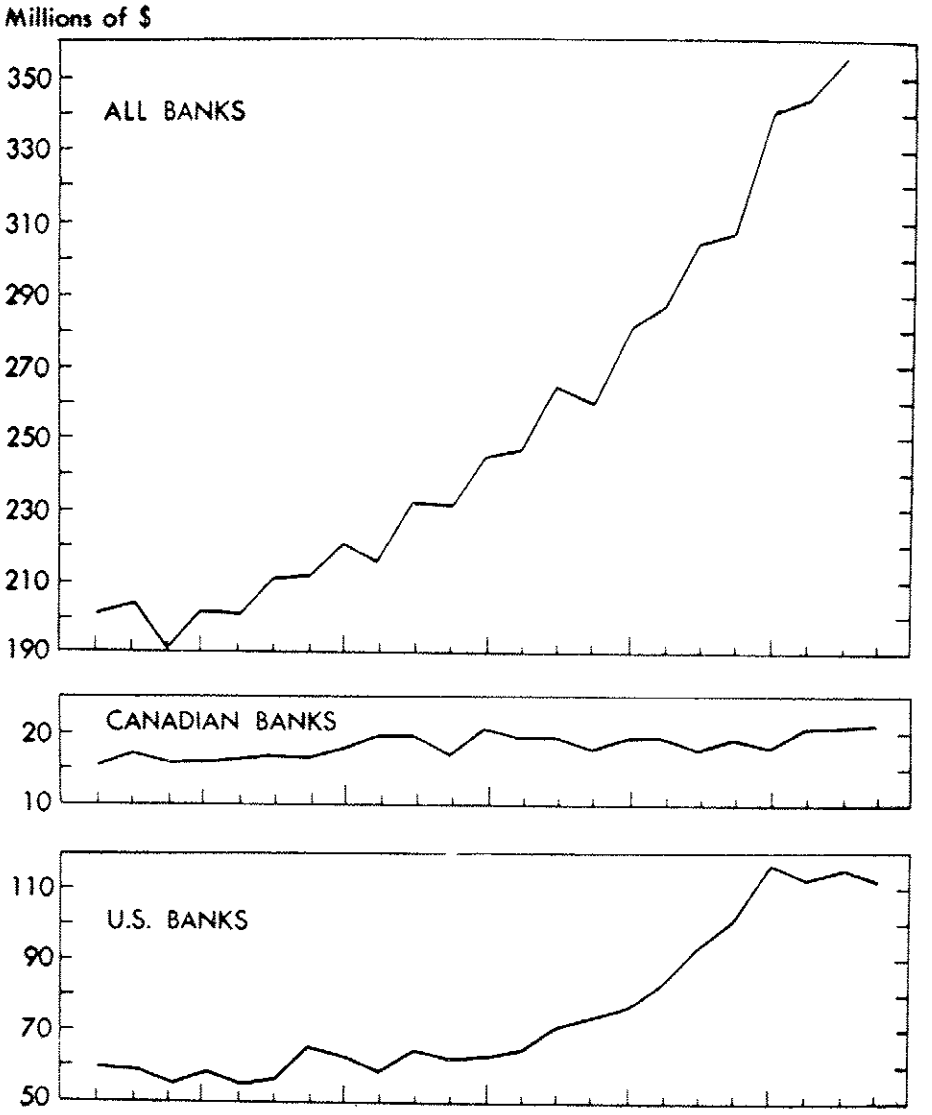
(35) «Puerto Rico's Monetary System and Economic Growth,» *op. cit.*, p. 3.

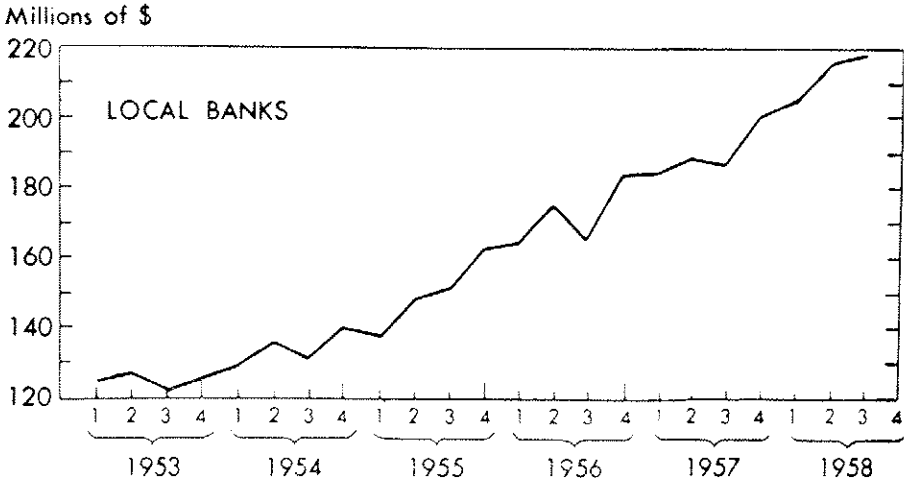


Source: *Comparitive Financial Conditions of Commercial Banks in Puerto Rico*, Department of the Treasury, Commonwealth of Puerto Rico.

CHART III

TOTAL DEPOSITS





Source: *Comparitive Financial Conditions of Commercial Banks in Puerto Rico*, Department of the Treasury, Commonwealth of Puerto Rico.

by local merchants, producers, and consumers to whom local banks can more adequately cater, it is not surprising that continuing advances have been made in the loans of local banks. The possibility and opportunity of expanding loans throughout the economy was thus stronger than any adverse cyclical reaction.

This does not mean that credit tightness on the Mainland has but little effect. Tighter U. S. Mainland credit conditions will be felt in Puerto Rico through the increased difficulty of selling mortgages and through the higher costs of bond issues. For example, in 1953, when for a while credit was very tight, «the impact in Puerto Rico was felt particularly through the difficulty in disposing of FHA mortgages. Residential construction suffered a corresponding setback.» (36) But, on the whole, there has been no severe restraining effect either on the expansion of the banking system or on the expansion of the economy due to credit unavailability. It is very interesting, for example, to note that commercial bank rates in Puerto Rico occasionally even move in a different direction from Mainland rates. (See Table 21.)

We are left with the conclusion that the banking system of Puerto Rico has hardly been affected by Mainland fluctuations

(36) Vernon R. Esteves, «Statement to the National Monetary and Credit Commission,» October 9, 1958. (Mimeographed.)

TABLE 21

PUERTO RICAN AND MAINLAND BANK RATES

	1951	1952	1953	1954	1955	1956	1957	1958
Bank rates in 19 U. S. cities			3.69	3.61	3.7	4.2	4.6	4.3
N. Y. C. rates			3.46	3.36	3.47	4.03	4.46	4.06
Puerto Rico	6.2	6.6	6.2	6.4	6.5	6.0	5.9	6.1

SOURCE: *Federal Reserve Bulletin*, «Report of examinations of native and foreign commercial banks supervised by the Secretary of the Treasury of the Commonwealth of Puerto Rico.» (Courtesy of Juan Labadie Eurite, Assistant Secretary of the Treasury in charge of Financial Affairs.)

since the beginning of the economic development program. There are a number of reasons for this. First of all, banks in Puerto Rico, especially local banks, have always been very liquid, i. e., they have always had a substantial amount of excess reserves, whose importance diminished with increased Mainland banking ties and with the introduction of FDIC. Secondly, liquidity was further increased by a strong rise in deposits resulting from the inflow of capital due to the development of the island, and the increased use of the banking system by the population at large, whose incomes were rising and who were beginning to appreciate the function of demand and savings deposits. Thirdly, economic development has encouraged the banks and made it easier for them (especially local banks) to increase the use of credit in the economy — i. e., with expanding markets locally for all types of businesses, they found more and more credit-worthy firms which needed and had to be taught the use of loans from the banks for running business with increased turnover. In this sense then, economic development spurred on by Mainland capital has spread some of its secondary growth effects through the banking system.

The chief question which cannot be answered at this time is: what will be the effects of Mainland fluctuations once the island banking system has matured, i. e., once much of the excess reserves have vanished and once the system has fully expanded? Then the possibility might exist that a Mainland recession, which cuts off the flow of capital to the island and which curtails exports, would bring along tight conditions in the banking system. Loans might have to be curtailed, interest rates might increase, and a secondary contractionary wave would thus hit

the island. This, of course, discounts the possibility of countercyclical actions by local authorities — e.g., that reserve requirements, which are set in the island, are not lowered, that the Government Development Bank takes no remedial actions. Although in this sense a Mainland recession might bring on tight conditions in the island, Mainland credit might be loosened as a countercyclical measure. Thus, higher interest rates on the island relative to the Mainland might attract some capital, but, even more important, with lower Mainland rates it might be more attractive for the island government to sell bonds on the Mainland, the return of which would be used for capital projects which might be stepped up during a recession.

PART III

THE SENSITIVITY OF PUERTO RICAN EXPORTS AND INVESTMENT TO U. S. MAINLAND FLUCTUATIONS

The exposure of the Puerto Rican economy to the Mainland cycle will to a considerable extent depend on the degree of fluctuations of those variables which directly affect the island's exports and investments. The purpose of this brief chapter is to give the results of some rough measures which were made on the income elasticity of demand of the Mainland for the type of products which Puerto Rico exports and on the Mainland determinants of investment.

Income Elasticity of Demand for the Type of Products Exported by Puerto Rico

It should be remembered that the changing export dependence of the island economy has to be viewed from two not mutually exclusive points of view: the greater export/gross product ratio and the change in the commodity structure of exports. With the rise in the former ratio (from 32 % before the war, to 44 % in 1947-48, to 53 % in 1956-57) the commodity structure has changed to such an extent that the category Vegetable Food Products and Beverages dropped from 71 % of total exports in 1947-48 to 33 % in 1956-57, while textiles increased from 18 % to 27 %, machinery and vehicles from almost nothing to 8 %, etc. It was also shown previously that the growing industries rely to a much greater extent on the foreign market than the old agricultural and needle works industries. With this in mind, we tried to discover at first

to what extent the key Puerto Rican export items are subject to fluctuations on the U. S. market over the cycle.

Our procedure was to take the main aggregative categories of Puerto Rican exports and see how such goods fare over the cycle in the U. S. Since Puerto Rican goods do not have generally distinguishing features, I assumed that they form part of the general supply of each industry to which they cater on the market. I therefore used total U. S. production indexes of these goods and observed their fluctuations. I assumed that the observed sensitivities ought to give us an approximation of the demand elasticities for Puerto Rican exports. The results are, of course, subject to severe qualifications which I shall comment on again below.

Since the business cycle is a short-run phenomenon, the relationship of economic variables during the cycle ought to be observed on a monthly or quarterly rather than on a yearly basis. I have decided to use quarterly observations due to difficulties in assembling and computing all the necessary data. The key independent variables in our analysis are U. S. GNP, Disposable Income, Investment, and general industrial production. For the dependent variables, which are supposed to indicate the demand in the general U. S. market for the type of products Puerto Rico exports, I wanted to use quarterly consumption and manufacturers' sales figures. This attempt was discontinued due to the immense amount of work involverd and the dubious results which we would get with restricted facilities. Consumption figures are available only on a limited scale, and manufacturers' sales are available, but uncorrected for price changes. The alternative was to choose U. S. production indexes which are published on a monthly basis and which do not present price adjustment problems. I was also able to obtain figures dating back to 1947 without running into the problem of comparison arising from the change of base years in the early fifties. This was possible because the Federal Reserve Board in its December, 1953, *Bulletin* conveniently published monthly industrial production indexes dating back to 1947 in terms of the new 1947-49 base, taking into account all the changes of relative weights.

There can be no doubt that production indexes are crude measures of demand, but they should give a general indication of the reaction of individual items to changes in national aggregates — investment or income — or general industrial production. On the downswing they might exaggerate reactions, especially with consumer goods of a durable variety, since some

of the sales will come from inventories, while on the upswing an exaggerated reaction might be revealed due to the rise in consumption and the build-up of inventories. But it could justifiably be claimed that what I am really interested in is how the cycle will affect the factors employed in producing the product, not the total amount sold; in that sense production indexes might be even more meaningful.

I began by making a list of Puerto Rico's principal export categories. Eleven product groups were included:

Stone, Glass, and Clay	Petroleum and Coal Products.
Apparel	Chemicals
Textile Mill Products	Paper and Allied Products
Food and Beverages	Tobacco
Machinery	Leather Products
Fabricated Metal Products	

From monthly data I then calculated quarterly indexes of U. S. production, adjusted for seasonable variation, for each of the products, and compared their fluctuations in relation to GNP, Disposable Income, Investment, and total industrial production. This has been reproduced in Table 22.

I went a step farther in establishing the sensitivity of the products to the cycle. Taking the National Bureau of Economic Research's dates of peaks and troughs in the cycles since the war, I fitted the relevant quarterly production data to approximate the latter. By «approximate» I mean that come data were used with a lead or lag of a quarter, since not all indexes reached their peaks or troughs at exactly the same time. The purpose of this was to observe the degree of fluctuation from peak to trough and trough to peak for each product. I then averaged the upward and downward movement for each product and computed for each product the ratio of its upswing or downswing to the up or downward movement of general industrial production. (See Table 24.) A ratio of over 100 would indicate an upward or downward movement greater than the general trend of production (or economic activity), while a ratio smaller than 100 would indicate a lesser sensitivity to the cycle than general production. What are the results?

The general impression is that Puerto Rican exports are increasingly concentrated on products which experience sharper fluctuations over the cycle. Food products, beverages, and tobacco, which are in the declining category of the commodity export

structure, fluctuate to a much smaller extent than industrial production. This is not surprising since it is usually claimed that foodstuffs are relatively income inelastic. Textile products which represent a growing proportion of Puerto Rican exports are considerably more volatile over the cycle, especially in the downward direction, where they fall more sharply than general industrial production, while in the upward movement they rise less than the latter. It should be noted, however, that the apparel component, which is extremely important in the general textile production of Puerto Rico, is *less* sensitive in both the upward and the downward direction than general industrial production.

Machinery and Chemical products which represent a growing item on Puerto Rico's export list reveal a much greater sensitivity in the upward direction than general industrial production. This reflects a considerable growth trend in those industries. In the downward direction Machinery is only slightly greater than our reference series, while Chemicals are more than fifty per cent smaller. Pretroleum products and Leather products also exhibit less sensitivity to the general cycle, while Stone, Glass, and Clay products fluctuate only slightly more than the reference series.

It can be concluded that the commodity export structure of Puerto Rico has become increasingly dominated by products which fluctuate to a greater extent over the cycle than agricultural products, which used to be dominant. But on the downswing most of the «growing» products are either equally or less sensitive to the reference cycle, with the exception of metals and textiles (remembering, however, that a great component of the latter are apparel products which are less sensitive than the textiles in general). On the upswing, the structure is less sensitive than the reference magnitudes for the most important export components, but in the fast-growing fields of machinery and chemicals the reaction on the upswing is greater than the reference series. (See Tables 22, 23, 24.)

New Investments in Puerto Rico as a Function of U. S. Mainland Variables

Just as one looks for some definite relationships between Puerto Rican exports and the general behavior of the type of goods exported on the Mainland, one might also hope to find significant systematic relationships between investment behavior in Puerto Rico (which consist to a large extent of Mainland cap-

TABLE 23

FLUCTUATIONS DURING THE CYCLE

NBER Cycle	Us Ind. Prod.	Fabric. Metals	Machin.	Text. Mill prds.	Apparel	Stone, Glass & Clay	Leather prds.	Tobacco	Paper & prds.	Chemicals	Petroleum & Coal prds.	Food & Bev. Nfs.
Peak	104	104	105	110	104	107	112	102	104	104	104	100
(1948-3Q)	— 9	— 9	—14	—27	— 4	—12	—20	— 4	—13	— 7	— 6	0
Trough	95	95	91	83	100	95	92	98	91	97	98	100
(1949-3Q)	41	44	72	28	16	40	12	16	43	53	34	8
Peak	136	139	163	111	116	135	104	114	134	150	132	108
(1953-2Q)	—13	—17	—25	—20	—14	— 7	—12	—14	— 5	— 5	— 9	— 3
Trough	123	122	138	91	102	128	92	100	129	145	123	105
(1954-3Q)	22	18	34	18	11	30	13	12	31	40	18	8
Peak	145	140	172	109	113	158	105	112	160	185	141	113
(1957-3Q)	—17	—19	—34	—18	—11	—22	— 8	4	— 8	— 7	—12	1
Trough	128	121	138	91	102	136	97	116	152	178	129	114
(1958-2Q)												

SOURCES: Dates of peaks and troughs are based on National Bureau reference cycle sese Moore, Geoffrey H., *Measuring Recession*, Ocasional Paper 61, NBER.
Data used from previous table.

TABLE 24

MEASUREMENT OF SENSITIVITIES

	Average* Degree of Downturn	Ave.* Rise	Ratio of Individ Fall to Ind. prod Fall	Ratio of Individ Rise to Rise in Ind. prod
Industrial Prod.	—13	32		
Machinery	—24	53	104	166
Fabricated Metals	—15	31	115	97
Textile Products	—22	23	169	72
Apparel	—10	13	77	41
Stone Glass Clay	—14	35	108	109
Leather Products	—13	12	100	37
Tobacco	— 4	14	30	44
Paper and Allied Prods.	— 8	37	61	115
Chemicals	— 6	46	46	143
Petroleum & Coal Prods.	— 9	26	69	81
Food and Bev.	0	8		25

SOURCE: Computed from previous table.

* Averages computed from previous table.

ital) and Mainland investment variables. The discovery of any significant relation of the latter type would help the policy maker in pinpointing the sectors on the Mainland which need careful attention in the formulation and direction of promotional efforts. A test of significance would also establish whether or not investment in Puerto Rico is subject to the cycle at all.

My efforts to discover relationships were concentrated on a number of simple regression analyses. As the dependent variable I chose the quarterly openings of new EDA-promoted plants. There are no quarterly investment figures available for Puerto Rico. As independent variables I chose in turn U. S. industrial production index, investment in new plant and equipment, and profits of corporations. Since the opening of new plants lags behind the original decision to invest, I regressed the dependent variable on the independent variables with lags of one, two, or three quarters. (See Table 25.)

Unfortunately no result of any significance was found. After having performed a number of regressions, I chose the relationship with the highest correlation coefficient, new plant and

TABLE 25

EFFECTS OF MAINLAND VARIABLES ON PUERTO RICAN INVESTMENTS *

(Correlation coefficients based on quarterly series from 1947 to 1959)

Mainland Independent	Correlation Coefficient
Variables	
1. U. S. Industrial Production Index	
a) No Lag	.780
b) Two Quarter Lag **	.781
c) Three Quarter Lag	.756
d) Four Quarter Lag	.756
2. New Plant and Equipment	
a) No Lag	.707
b) One Quarter Lag	.745
c) Two Quarter Lag	.759
d) Three Quarter Lag	.852
e) Four Quarter Lag	.718
3. Profits	
a) No Lag	.337
b) Two Quarter Lag	.348
c) Three Quarter Lag	.427
4. Correlation when trend removed with New Plant and Equipment Three Quarter Lag	.009

* Puerto Rican Investments are the dependent variable used for all these simple regression analyses. Since total quarterly Puerto Rican investment data are not available, we used new plant openings as our dependent variable.

** A lag here means that the dependent variable lags one more quarter behind the independent variable.

SOURCE: Computed from data supplied by the Puerto Rican Economic Development Administration, *Survey of Current Business*, Department of Commerce, and the latter's bi-yearly *Business Statistics*.

equipment with a three quarters lag, and eliminated the trend in the time series on both sides of the equation, i. e., I regressed the dependent and independent variables against time, then projected values for each based on the obtained coefficients; then I obtained the differences between the projected and actual values of the independent and dependent variables, and finally I regressed the latter on the former. As can be seen in Table 25, there exists no relationship between the Mainland variable and Puerto Rican investment which can be said to be of a cyclical nature.

It is still of interest, however, to glance at the «insignificant» correlation coefficients. The strongest relationship obtained was between new plant openings and Mainland new plant and equipment with a three quarters lag.

The assumption of Puerto Rican authorities that there exists a lag between Mainland and Puerto Rican economic fluctuations would therefore seem to be justified from the point of view of investment behavior. Furthermore, the investment program of Puerto Rico is influenced primarily by general investment decisions on the Mainland. These conclusions are very speculative in character, however, because when the trend is removed, no relationships remain.

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CHAPTER IV

THE BEHAVIOR OF PROMOTED FIRMS OVER THE CYCLE

It has already been mentioned in the introductory chapter that the degree to which the cycle is passed on from the U. S. Mainland to Puerto Rico depends not only on the income elasticity of demand for the products the island exports, the import content of these exports, and the flow of investments, but also on the type of enterprises the Fomento program has been attracting. I claimed that these enterprises can be divided into three broad categories: new local enterprises; firms which have been set up in, or have resettled in the island, in their *entirety;* and firms or plants which are subsidiaries of larger Mainland enterprises. Excluding the firms which cater principally to the local market, it can be claimed that the rate of production of the first two types of firms will depend on general U. S. market conditions.

Some additional possibilities are offered by the third type of firms, the subsidiaries. They could be divided into two subcategories: those firms representing horizontal expansions of Mainland firms and those representing vertical extensions. The former are simply the extension of capacity of existing corporations for producing a finished product. The second type are plants set up by Mainland corporations either to produce parts of the product which is assembled on the Mainland, or to perform an operation on a product shipped to the island for that specific purpose and then shipped back for further processing.

It was further maintained that the horizontal plant's operations over the Mainland cycle are difficult to predict because they depend on the policies of each corporation. If a downswing in

economic activity reduces a firm's sales, and hence forces a decrease in production, how will this come about? Will all plants of the corporation curtail their production by the same proportion, or will certain plants be shut completely while others continue to produce at full capacity? If the latter is the case, which plant would be closed, the Puerto Rican or a Mainland plant? Similar questions could be asked about plants forming parts in the vertical link of the production process. In that case, considerations similar to the ones mentioned above become relevant. If the Puerto Rican plant is the only vertical link in the production process, its operation might be more stable because it would follow only general fluctuations in the output of the firm (unless there is a drastic change in inventory policy of certain factors of production).

Although it is obviously an impossible task to quantify and test all of these considerations, I was able to get some interesting insights through the cooperation of the Economic Research Staff of Puerto Rico's Economic Development Administration. Due to the confidential nature of much of the information in the files of EDA, I was restricted in the type of information available. Data was gathered in the files of EDA for all promoted plants. The chief dependent variable was the number of man hours per month, of which I got the highest month of the peak year and the lowest for the trough year. Since I only covered the 1953-54 and 1957-58 recessions, the highest monthly man hours for 1953 and 1957 and the lowest for 1954 and 1958 were obtained for each plant. (The fact that this produces distortions due to seasonal considerations and thus could show declines much sharper than those caused by cyclical consideration will be taken into account below when I shall evaluate the data.) This data was collected on a specially prepared sheet (see Appendix to this chapter). On that sheet each firm was classifield according to the SIC code (in my analysis I concentrated on the first two-digit classification), according to type of ownership, and according to its principal market outlet (Puerto Rico or U. S.).

Some remarks are in order for the second type of classification-type of ownerhip. There are seven different types of ownerships:

1) Local Autonomous: a firm promoted by EDA which is owned by Puerto Rican residents. (LA)

2) Local Contractor: a firm promoted by EDA, owned by Puerto Rican residents, which operates principally on a contract basis, either with local or with Mainland firms. (LC)

3) Mainland Autonomous: a firm which is owned by Mainland interests, but which is not a subsidiary of a Mainland firm. (M Aut)

4) Mainland Affiliated: a subsidiary of a Mainland corporation. (MAH)

5) Mainland Affiliated Contractor: a firm connected to a Mainland concern but operating only on a contract basis.

6) Mainland Independent Contractor: Mainland-owned firms operating under contract with many firms (in our tabulations this category was merged with 5 because of the very small number available). (MAHC)

7) Foreign: a firm owned by foreign interests. (F)

These are the only breakdowns by type of ownership available. It was virtually impossible to obtain a breakdown along the horizontal-vertical line. Although a description of the product each firm produces is available, it is mostly impossible to tell whether the output of a Mainland affiliated firm will be further worked in a Mainland plant of the same corporation. For example, an affiliated plant might produce tubes for television sets, but it is usually quite unclear whether the Mainland concern will assemble these tubes into television sets or whether it simply sells tubes on the market; or, it is difficult to tell whether the output of a subsidiary producing «rubber fittings for electronics products» will be sold directly by the Mainland parent or will be used for further processing. One might still claim that there is a difference between plants producing a product which is ready for the final consumer market and those producing parts of a product which has to be assembled elsewhere, even if the assembling takes place in another firm. In other words, there might be a considerable difference between a «final» market and a «factor» market — i. e., a market for parts of a product to be assembled. Fluctuations in the sales of the former might be less pronounced than in the sales of «parts», since the latter could easily be affected by important secondary changes in inventory policies for these «parts.» Such phenomena

will have to be intuitively taken into account when examining the tabulations below.

Table 26 should make it clear why the lack of horizontal-vertical data will be no great hindrance. It contains a tabulation from the December 1958 Directory of EDA-promoted plants. From the short description of the product of the firm and from the name of the parent firm, I tried to classify firms according to a horizontal-vertical relationship. Only in the categories of Electric Machinery and Textile Mill Products were there a substantial number of firms producing a product, which according to the type of parent firms they had, could be assumed to form part of a vertical chain of production. It would seem therefore that our dealing with local, autonomous and affiliated categories will not greatly harm our analysis.

For tabulation purposes the absolute number of monthly man-hour decline was converted into percentage declines. The tabulations were undertaken according to the two different periods examined, type of firm, type of market, type of product, and size of firm (size measured by maximum man hours worked). A conglomerate table with most of these variables is reproduced in the Appendix to this chapter. Let us now turn to a step-by-step analysis of the tabulation results.

Distribution of the Type of Ownership

It is quite evident from Table 27 that Mainland Affiliated firms are dominant in all the industry groups which have spearheaded the island's industrialization. As might be expected from descriptions in previous chapters, Apparel and Textile Mill products dominate, followed by Miscellaneous products (which include sporting goods, costume jewelry, plastic products, etc.), leather products, and metal products and machinery, both of which have been looming larger in the second period, reflecting an effort by the development authorities to strive toward greater diversity. A relatively large share of Apparel products are also produced by Mainland Affiliated Contractors, while firms in the Miscellaneous category, producing light manufactured items, have the largest contingent among the Mainland independent producers. Locally owned firms operate primarily autonomously and are concentrated on food products, apparel, stone, glass, and clay, and the miscellaneous category.

TABLE 26

TABULATION OF PLANT CHARACTERISTICS

	Mainland Owned			Local	Foreign
	Sole Plant *	Horizontal Subsid.	Vertical Sub.		
Food & Kindred Products (20) **	3	14		16	1
Tobacco Manufactures (21)		3			
Textile Mill Products (22)	4	31	8	8	
Apparel & Related Products (22)	11	108		31	2
Lumber & Wood Products (24)		4		1	
Furniture & Fixtures (25)	2	3		13	
Paper & Allied Products (26)	1	10	1	1	
Printing & Publishing (27)	1	2	2	4	
Chemicals & Allied Products (28)	3	11	2	7	
Products of Petroleum & Coal (29)	1	2	1		
Rubber Products (30)	8	11		1	1
Leather & Leather Products (31)	2	27	1		1
Stone, Clay & Glass Products (32)	4	6	1	20	1
Primary Metal industries (33)	1	1	2	3	
Fabricated Metal Products (34)	9	21	3	10	
Machinery (except Electric) (35)	3	12	3	2	1
Electric Machinery (36)	5	32	12	4	
Miscellaneous (38-9) ***	15	51	5	7	7

* Mainland owned plants with no Mainland connection.

** SIC Classification Number.

*** Miscellaneous— principally Sporting Goods, Costume Jewelry, Plastic Products, Lapidary Work, Artificial Flowers, etc.

SOURCE: Tabulated from *Directory of Fomento Promoted and Assisted Manufacturing Plants*, December 31, 1958, Economic Development Administration.

It is interesting to observe developments between the two-periods. The principal first impression is of a relatively faster growth in Locally Autnonomous and Mainland-owned Autonomous firms, than in other types of firms. This partially reflects efforts made by EDA to attract more local capital and also a secondary wave of local savings into the industrializing sectors, spurred on by increased income and funds due to the momentum of industrialization and the more suitable climate for island capital once a large number of more experienced enterprises have paved the way. The strongest growth of local firms is found in the food, furniture, stone, clay, and glass industries, in which native firms have a natural advantage and which are partially induced by

TABLE 27

TYPE OF OWNERSHIP DISTRIBUTION BY INDUSTRY GROUPS *

Industry Group	1953-4						1957-8					
	LA	LC	MAut	MAff	MAffC	For	LA	LC	MAut	MAff	MAffc	For
20	4			5			10		2	4		
21				1						3		
22	3		2	30	2		4		3	34	5	
23	2	1	1	55	20	1	9	9	5	78	34	2
24				1			2			1		
25	1			1			9	1	3	2		
26				5					1	5		
27				1			1		1	2	1	
28	1			5	1		2		3	5		
29				2					1	3		
30				8			2		6	13		
31				19	1				2	23	1	
32	3		1	3		2	10		5	2		2
33				1			1		1	4		
34	1			10		1	5		3	21		
35			1	10			2		3	6		
36	2		3	25	1	1	5		5	33	1	1
38-9	3	1	8	38	4		7	2	11	43	6	2
Totals	20	2	16	220	29	5	69	12	55	282	48	7

* Industry group numbers explained in Table 26.

Source: Tabulated from Conglomerate Table in appendix to this chapter

growth of population and income; but there were also marked increases in apparel, where contractors made their appearance, metal products, electrical machinery and the miscellaneous industry group. The growth of Mainland Autonomous firms was spread fairly evenly over the spectrum of EDA industries, especially notable being the rubber products, apparel, and chemicals industries. The growth of contractors from the Mainland chiefly continued in the apparel, textiles, and miscellaneous products groups. It is obvious that in absolute terms the growth of Mainland affiliates, i .e., the subsidiaries, was the largest of all types. Especially noteworthy here is the large relative growth of the number of firms in metal products and electrical machinery.

To sum up, between the two periods under examination there has been an important rise in firms other than the Mainland Affiliate type, thus bringing a little more balance, though the latter is still supremely domimant; and there has also been a marked growth in firms outside the apparel and textile industries, thus leading to a little more diversity in the growing Puerto Rican industrial structure.

We shall return later to assess these developments in the light of future cycle sensitivity after we have examined the evidence on the behavioral patterns of these firms as seen through various types of classifications.

Market Orientation

Another preliminary matter for the better understanding of the data is the market orientation of firms according to type of ownership and industry group. The market orientation according to type of ownership is reproduced in Table 28, section a. As might be expected, there are a larger number of Local Autonomous plants oriented to the local than to the Mainland market, (1) especially in the second period under analysis. This reflects a secondary reaction to industrialization — with higher incomes there are an increasing number of domestic market possibilities which are best catered to by local interests. Most Local Contractors are oriented toward the U. S. Mainland. There has been an interesting change in the distribution of Mainland autonomous firms. In the first period, Mainland-oriented plants predominated,

(1) When a firm is oriented toward one market, this means that not necessarily all of its products are sold in that particular market, but rather that over 50% of its sales are made in that market

while in the second period Puerto Rico-oriented plants outnumbered the others; this also reflects the attraction of a growing local market to Mainland-owned firms. Even in Mainland Affiliated firms one finds a small relative shift toward locally-oriented plants. Mainland Affiliated Contractors still cater exclusively to Mainland customers.

As one would expect, the orientation of most firms in the exports industries, like Textile Products, Apparel, Electrical Machinery, and Miscellaneous items, is toward Mainland markets. (See Table 28, section b.) Local orientation is primarily in industries which are affected by general industrial development in the island, like Stone, Clay, Glass, or Furniture. Much of the growth in the above-mentioned Puerto Rico-oriented firms took place in the latter industries, and also in the Food Products, Fabricated Metal Products, and Machine industries.

Size of Plants

A final matter to examine before observing the behavior of the firms in the two recessions is the size of the plants by type of ownership and industry groups. Size was measured in each period by the maximum number of man-hours per month worked in the boom year. (See Table 29.) When measured by type of ownership, it is evident that Local Autonomous plants are rather small, the bulk being in the less than 1,000 man-hours category; this is true even in the second period, growth having taken place principally in the smaller type of firms. Local contractors are evenly divided in the second period between very small and medium size firms. Mainland Autonomous firms also consist chiefly of small firms, mostly less than 3,000 man-hours, the bulk in the less than 1000-man-hour category. Although the absolute numerical majority of Mainland Affiliated firms was in the smallest types, the percentage has decreased, and most of the relative gain was in firms with 2000 to 5000 man-hours. Among the *largest* firms, the Mainland Affiliated category had relatively the *largest* percentage, and these types of firms kept their share over the two periods. Mainland Affiliated contractors were predominantly in the medium-to-large range, and this was strengthened over the two periods, especially in the 4000-to-5000 man-hour category. Finally, foreign firms were among the smaller ones.

TABLE 28

a) MARKET ORIENTATION ACCORDING TO OWNERSHIP TYPE

Type of Ownership	1953-4		1957-8	
	Puerto Rico	U. S.	Puerto Rico	U. S.
Local Autonomous	11	9	56	13
Local Contractor		2	1	11
Mainland Autonomous	4	12	33	22
Mainland Affiliated	26	190	67	215
Mainland Affiliated Contractor		28		48
Foreign	4		7	

b) MARKET ORIENTATION ACCORDING TO INDUSTRY GROUP

Industry Group *				
20-	2	7	10	6
21-		1	1	2
22-	6	31	7	39
23-	5	75	18	119
24-		1	2	1
25-	2		14	1
26-	4	1	5	1
27-		1	2	3
28-	2	4	4	6
29-		2	2	2
30-	1	7	6	15
31-		20	2	24
32-	6	3	17	2
33-		1	4	2
34-	5	7	12	17
35-	2	9	6	5
36-	6	26	12	33
38-9-	7	47	10	61

* Industry group numbers explained in Table 26.

SOURCE: Tabulated from Conglomerate Table in Appendix to this chapter.

TABLE 29

a) PLANT SIZE BY TYPE OF OWNERSHIP
(by monthly man hours)

Type of Ownership	0-1000	1-2000	2-3000	3-4000	4-5000	5-10,000	10,000
1953-4							
Local Aut.	10	1	2	2		1	2
Local Contr.				1		1	
Mainland Aut.	6	6	1			1	
Mainland Aff.	55	27	20	14	11	35	18
Mainland Aff. Cont.	6	3	7	2	4	7	1
Foreign	3	1	1				
1957-8							
Local Aut.	45	8	4	3	4	4	2
Local Contr.	3	2	2		1	2	1
Mainland Aut.	26	9	7	2		3	
Mainland Aff.	65	42	43	26	21	41	30
Mainland Aff. Cont.	5	3	6	5	9	7	4
Foreign	3	1	1				

b) PLANT SIZE BY INDUSTRY GROUP
(1953-4/1957-8)

Industry Group *							
20-	3/8	2/3	2/1		0/2	0/1	0/1
21-							1/2
22-	6/7	6/3	2/11	3/4	1/6	6/7	2/5
23-	12/25	6/18	10/17	8/12	8/15	17/25	9/13
24-	1/1	0/1					
25-	0/8	0/1	1/4	0/3			
26-	1/1	0/1	1/1	1/1	0/1	2/1	
27-	1/5	0/1					
28-	6/6	1/3				0/1	
29-	1/2					0/1	0/1
30-	4/6	1/21	0/2	1/3	2/1	1/2	0/1
31-	1/2	2/1	3/6	1/2	2/2	7/6	2/2
32-	2/6	1/3	1/3	1/1	0/3	1/0	3/3
33-	1/3		0/1	0/1		0/1	
34-	4/16	1/5	2/5	0/1		1/0	
35-	8/10	1/3					
36-	14/18	6/5	3/4	2/3	0/3	2/5	2/4
38-9	15/24	11/13	6/9	1/6	0/3	7/9	2/4

* Industry group numbers explained in Table 26.

SOURCE: Tabulated from data gathered by EDA especially for this project

When examined by industry groups, we find a predominance of small plants in the Food, Furniture, Printing, Chemicals, Rubber Products and Machinery industries, although in the second period some large firms make their appearance in the Food industry. In textile products and apparel, we find the smallest firms diminishing over the two periods from almost 50% to 30% or less, the largest declining from a little over 30 % to a little less than 30 %, while medium firms gain some ground from 30 % or less to 40% or over. In the Fabricated Metal Products and Machinery (except electrical) sectors, small firms have predominated and continue to do so. Although over half of the firms in the Electrical Machinery industry are small firms, there has been a definite downward trend in small firms (from about 69 % to 55%), while there has been an increase in medium and large firms; this is also the case in the Miscellaneous sector.

Behavior of Firms During the Recessions

On the basis of the above background information we are now ready to examine the behavior of the firms examined in the 1953-54 and 1957-58 recessions. The procedure will be to examine percentage decline in monthly man-hours between the highest month in the peak and the lowest in the trough years. We shall examine this variable from four different viewpoints — type of industry, form of ownership, market orientation, and size, all of which will be integrated in a final evaluative section.

1) *Variation in Man Hours per Month in Different Industries*

Our discussion in this section refers to Table 30. We shall assume that a decline of 0-20 % constitutes no cyclically-induced decline. Many firms in this category actually did not decline at all, and for some who actually experienced a decline, seasonal or random factors were responsible, since we took the highest month of the peak and the lowest month of the trough year. A decline in monthly man-hours worked of 20 % to 40 % is rather mild, 40% to 60% we shall call substantial, and 60% and over would be severe. We also included the number of plants which discontinued during this period. Here a word of caution is needed. Discontinuance of operation is not necessarily induced by recessionary forces, even if they occur during a Mainland recession period; it might be due to such factors as higher labor cost than expected, lack of managerial talent, etc.

An examination of the 1953-54 period shows a large proportion of plants which experienced decreases in monthly man-hours of over 60 % in the Textile Mill Products (50 %), and Apparel Industries (42 %). Declines in the increasingly important Electric Machinery Industry were much milder, with only 27 % of the firms decreasing man-hours by more than 60 %. This probably reflects the very strong growth element in that industry, with many firms just getting started in that period. In the Miscellaneous sector, which contains many light manufacturing industries, we find one of the largest percentage of firms curtailing operations by 80% to 100%. In most other sectors we find a fairly even distribution between light and heavy declines. Proportionately, the highest number of discontinuances of operations are found in the Textile Mill Products, followed by Leather Products and Apparel.

Of greater interest is a comparison between the two periods. In the key Textile Mill Products and Apparel Industry, we observe a sort of polarization. The percentage of firms curtailing man-hours drastically (over (60 %) remain the same in Apparel, and increase in Textile Mill Products (32% of the firms in that industry cutting man-hours by more than 80 %), while the percentage of firms curtailing production only slightly (20 % - 40 %) increases; the decline took place in firms curtailing man-hours between 40 % - 60 % and 0-20%. There was a substantial rise in the number of firms curtailing operations over 60 % in the growing Electrical Machinery and Miscellaneous industries; after Textiles, Electrical Machinery had the highest percentage of firms experiencing declines of over 80 %. Although the trend is not pronounced, we also find a bias toward greater declines in the non-Electric Machine, Metal Products, Leather Products, and Furniture industries. Only the Food Products industry experienced much milder declines than in the previous recession.

2) *Variations in Man-Hours per Month by Form of Ownership*

The results of this tabulation are contained in Table 31. In the first period, 1953-54, we find that if foreign firms are left out, more Mainland Affiliated firms decreased their monthly man-hours by less than 40 % than any other category, but at the same time the proportion of firms curtailing man-hours by over 60 % is also very large. Most other categories had more firms in the medium range of decline (40 % - 60 %) than the

TABLE 30

DECLINE IN MONTHLY MAN HOURS BY INDUSTRY GROUPS
(number of firms) *

Industry Group ***	Percentage Decline from Peak Month in Peak Year to Trough Month in Trough Year											
	1953-4						1957-8					
	0-20	20-40	40-60	60-80	80-100	DO**	0-20	20-40	40-60	60-80	80-100	DO**
20-		2	1	1	5			4	7	1	1	3
		(22)	(11)	(11)	(56)			(30)	(54)	(8)	(8)	
21-	1						1				2	
22-	3	6	5	8	6	9	3	11	5	8	13	6
	(11)	(21)	(18)	(29)	(21)		(8)	(28)	(12)	(20)	(32)	
23-	10	9	22	13	16	10	15	27	30	29	21	15
	(14)	(13)	(31)	19	(23)		(12)	(22)	(25)	(24)	(17)	
24-		1							1	1		1
25-			2				1	2	3	3	5	1
26-	1	2		1	1			3	2	1		
27-	1						2	3				
28-		2	1		3		2	2	3	1	2	
29-			1			1	2		2	1		1
30-	1	2	2	1	2		6	5	1	3	3	3
31-	4	2	3	2	6	3	2	5	3	8	4	4
32-		3	3	1	1	1	6	2	3	5	3	
33-	1						1	1	2	2		
34-	3	1	1	3	1	3	5	3	7	6	4	4
35-	2	3	1	3	1	1		4	2		4	1
36-	9	4	9	6	2	2	2	9	10	7	12	5
	(30)	(13)	(30)	(20)	(7)		(5)	(22)	(25)	(18)	(30)	
38-9-	6	9	13	8	12	6	6	7	16	16	16	10
	(13)	(19)	(27)	(17)	(25)		(10)	(11)	(26)	(26)	(26)	

* Numbers in parenthesis indicate percentage of total during year in that industry. Only used for large industries.
** DO— plants having discontinued operations in period under review.
*** Industry Group numbers are explained in Table 26.
SOURCE: See Appendix Conglomerate Table.

latter. Mainland Autonomous and Mainland Affiliated Contracting sectors had a very large proportion of firms drastically curtailing their man-hours. It should be noted, however, that the latter contained no firms which discontinued operation in the period, whereas the Mainland Affiliated sector contained 33 such firms.

A number of changes took place by the time of the second recession. There was a which substantial increase in Local Autonomous firms seems to have polarized the reaction pattern. The number of firms which did not decrease man-hours at all, or decreased them but slightly, increased from 26% to 32%, while the other extreme increased from 37 % to 46 %. The growth in the number of Mainland Autonomous firms also seems to have polarized the pattern; the percentage of firms decreasing man-hours by a relatively small amount had increased by 10 %; there was a small decrease in the percentage of firms cutting hours between 40 % and 60 %, and there was a large increase in the percentage of firms cutting man hours by 80 % to 100 %. In addition, there was a noticeable appearance of firms which discontinued operations. The appearance of an increased number of Local Contractors also shifted the weight in favor of large contractions of man-hours.

In the large group of Mainland Affiliated firms there was also a slight tendency toward greater contraction, especially with a decline in the percentage of firms hardly affected (i. e., 0-20 % contraction), and there was a concentration on the 40 % - 80 % contraction group. All this was accompanied by a decrease in the number of firms discontinuing operations. The most notable change occurred in the Mainland Affiliated Contractor group, where the percentage of firms with no or very slight contractions increased from 19 % to 52 %. But the latter group also produced seven firms which discontinued operations, whereas in the previous period there were none.

I shall evaluate these findings below, when the entire picture with all the relevant variables has been presented.

3) *Variations in Man-Hours per Month by Market Orientation*

Table 32 leaves no doubt of larger contraction of monthly man-hours worked in firms dependent primarily on the Mainland markets than in firms dependent primarily on local markets. More than two-thirds of Mainland-oriented plants in both periods

contracted man-hours by more than 40 %, while less than two-thirds of the other types of plants followed this pattern. There are no important changes in the second period for Mainland-oriented firms, except for a slight decrease in the extreme types of contractions. In the other firms, however, there is an increase in the extreme types of contractions, but this is accompanied by a relative decline in plants discontinuing operations.

4) *Variations in Man-Hours per Month by Size of Plants*

Due to the difficulties in managing the data, the tabulations in this instance are restricted to three types of decline; a relatively small decline is assumed to be a curtailment of from 0-50%, while large declines are in the 50%—90% range, and extremes in the 90 % - 100 % range. (See Table 33.) An unusual picture emerges. The proportionately largest number of firms with the smallest curtailment of man-hours are in the two extreme groups during the first period; in the second period these proportions decline somewhat, with a noticeable increase in extreme declines in the largest types of firms. Over the two periods some interesting shifts took place in the middle group. There was a slight increase in instability in the large group (5,000 - 10,000 man-hours), and an even larger increase in the smaller groups (1,000 - 3,000). At the same time the middle group (3,000 - 5,000) experienced a substantial increase in stability, with the 3,000 - 4,000 man-hour firms becoming the group with the highest percentage of decreases of less than 50 %.

Evaluation of Tabulations

We shall try to tie all these individual breakdowns together from the viewpoint of the ownership type, since we started this chapter by asking what the influence of the latter has been on the behavioral pattern of the firm. The reason for having gone into various directions was that each type of firm's behavior is governed by a number of different variables. Our procedure will be to start by summarizing the behavior of firms in this group, and then to evaluate this behavior in the light of the group's structural characteristics (i. e., type of product, size, market orientation) and the general behavior of firms when viewed through these individual structural angles.

TABLE 31

DECLINE IN MONTHLY MAN HOURS BY FORM OF OWNERSHIP
(number of firms) *

Forms of Ownership	Percentage Decline from Peak Month of Peak Year To Trough Month in Trough Year											
	0-20	20-40	1953-4 40-60	60-80	80-100	DO	0-20	20-40	1957-8 40-60	60-80	80-100	DO
Loc. Aut.	1	4	7	3	4	3	10	10	13	16	12	7
	(5)	(21)	(37)	(16)	(21)		(16)	(16)	(21)	(26)	(20)	
Loc. Contr.			1		1			1		4	6	1
M. Aut.	1	1	5	7	1		4	7	13	8	13	8
	(7)	(7)	(33)	(47)	(7)		(9)	(15)	(29)	(18)	(29)	
M. Aff.	37	36	40	34	43	33	32	55	60	54	51	28
	(19)	(19)	(21)	(18)	(23)		(13)	(22)	(24)	(21)	(20)	
M. Aff. C.	1	4	8	7	7		8	11	7	7	4	7
	(4)	(15)	(30)	(26)	(26)		(22)	(30)	(19)	(19)	(10)	
Foreign	1	1	2	1			1	1	1	2		1

* Numbers in parenthesis indicate percentage of total during year in that group.
** Only used for large numbers.
SOURCE See Appendix Conglomerate Table.

TABLE 32

DECLINE IN MONTHLY MAN HOURS BY MARKET ORIENTATION
(number of firms) *

Market	Percentage Decline from Peak Month in Peak Year to Trough Month in Trough Year											
	0-20	20-40	1953-4 40-60	60-80	80-100	DO	0-20	20-40	1957-8 40-60	60-80	80-100	DO
U. S.	34	35	51	41	54	32	36	59	67	64	65	38
	(14)	(14)	(21)	(16)	(22)	(13)	(11)	(18)	(20)	(19)	(20)	(12)
Local	8	10	13	11	2	7	19	27	29	26	20	12
	(16)	(20)	(25)	(21)	(4)	(14)	(14)	(20)	(22)	(20)	(15)	(9)

* Numbers in parenthesis indicate percentage of total during year in that group
SOURCE. See Appendix Conglomerate Table.

TABLE 33

DECLINE IN MONTHLY MAN HOURS BY SIZE OF FIRM
(number of firms) *

Size	Percentage Decline from Peak Month in Peak Year to Trough Month in Trough Year					
	1953-4			1957-8		
	0-50	50-90	90-100	0-50	50-90	90-100
0-1000	43	31	6	72	66	10
	(54)	(39)	(7)	(49)	(45)	(6)
1-2000	17	14	7	27	26	12
	(45)	(37)	(18)	(42)	(40)	(18)
2-3000	15	14	2	25	24	14
	(48)	(46)	(6)	(40)	(38)	(22)
3-4000	8	5	6	18	13	4
	(42)	(26)	(32)	(51)	(37)	(12)
4-5000	6	10	4	16	14	5
	(30)	(50)	(20)	(46)	(40)	(14)
5-10 000	20	18	8	23	28	6
	(43)	(39)	(18)	(40)	(49)	(11)
10 000	11	7	3	18	11	8
	(52)	(33)	(15)	(49)	(30)	(21)

* Numbers in parenthesis indicate percentage of total during year in that group.
SOURCE: Computed from data gathered by EDA for this project.

1) *The Local Autonomous Firm*

It was observed that a large proportion of firms in this category substantially curtailed man-hours (over 60 %), and another large contingent curtailed man-hours from 40 % to 60 % in the first period, and that in the second period there was an increased emphasis on the extremes, i. e., either small or substantially large curtailments. Let us examine this behavior in the light of the group's structural characteristics.

a) *Market Orientation*

Although Local Autonomous firms were fairly evenly divided between the U. S. and the local market in the first period (with a slight edge toward the local market), the increase in the total number of firms by the second period shifted the balance drastic-

ally toward the latter. Between the two periods there was a pronounced increase in the relative share of locally-oriented firms which curtailed operations by over 60 %, but a reduction in the other extreme. Thus the market orientation could partially explain the movement toward the larger extreme of Local Autonomous firms but not the encreased share of firms at the other extreme.

b) *Industry Group*

During the first period there was a concentration on Food, Textile Mill, Apparel, and Stone, Clay, and Glass products. In the first three classes a large proportion of firms curtailed their output drastically, while the latter had most of its firms curtailing man-hours in a medium fashion. In the second period Food and Stone, Clay, and Glass products, which are still among the leading products in the group, have a much larger proportion of firms curtailing man-hours by a medium amount and by small amounts, while Apparel firms had a tendency to maintain a large proportion in the large extreme, but increased the proportion in the small extreme at the expense of medium declines. Among the products which grew in relative importance, Furniture had relatively more firms in the large category, while Metal products were balanced with a slight emphasis on the larger curtailing side. We thus find that the polarization of the reaction pattern of Local Autonomous firms is also explainable when examined through industry groups, many of the new industries tending toward large man-hour curtailments and the older ones either polarizing or shifting toward smaller man-hour reductions. The balance of this polarization is slightly tipped toward the larger side, which is also the general picture which emerges when one simply examines the over-all behavior of Local Autonomous firms.

c) *Size*

Local Autonomous plants are mainly of the very small type, which were found to be among the stabler firms, though losing some of their stability in terms of curtailment of man-hours in the second period. The biggest growth in other sizes has been in the 1,000 - 2,000 man-hour category, which has also descreased in relative stability; the same is true of the additional plants in the large category of 5,000 - 10,000. The only increase contribut-

ing to greater stability was in the 4,000 - 5,000 category. Thus the change in the structure according to plant size also contributes to an explanation for the relatively larger increase in the percentage of firms having pronounced man-hour declines.

d) *Conclusion*

Local Autonomous firms can be considered to be of a type which produce a commodity in its entirety. They are subject to market fluctuations and their reactions in sales depend upon their individual policies. Since their orientation is principally toward the local market, where sales fluctuations are smaller than on the Mainland, one would expect considerably milder reactions in terms of man-hour curtailment. This was true in the first period when the number of firms curtailing man-hours over 60 % was proportionately smaller than elsewhere. The change in the second period, with a larger proportion at both extremes, could be accounted for by the higher standard of living and continued strong rise in the consumption of non-durable commodities, which include food and apparel, while there was a sagging in the consumption of non-durable commodities in 1957-58 (consumption of the latter falling from $ 102 million in 1956 to $ 94 million in 1957, and rising again to $ 102 million in 1958), which include furniture and metal products. The growth of Local Autonomous firms has tended in the recent recession not to change their previous behavior, which neither de-emphasized nor worsened the fluctuations which they passed on. But the movement toward greater numbers at the extremes has some interesting portents. The shift toward smaller decreases occurred mainly in older industries, while the newer types — furniture and metal products — strengthened the types of firms with larger fluctuations. If we assume that the latter are the dynamic sector as far as this group is concerned, then we should expect that in the future Local Autonomous firms will pass on the cycle with great amplitudes.

2) *The Local Contractor*

This group was quite unimportant in the 1953-54 period when only two firms operated in that category. By 1957-58, it had increased to eleven firms. Almost all of the group curtailed man-hours over 60 %, the majority over 80 %.

a) *Market Orientation*

In both periods practically all the firms catered primarily to the Mainland market, where there was a stronger emphasis on firms with large declines in man-hours worked.

b) *Industry Group*

Most firms operate in the Apparel industry, with a couple in the Miscellaneous category. In the former there was a slight decline in the proportion of firms having high curtailment rates and a pronounced increase in the small decrease category, while in the latter there was an increased tendency for large declines to take place. Thus, the industry group explains the firm's behavior only to a small extent.

c) *Size*

The majority of firms were in sizes which became less stable by the second period, i. e., in the smallest and next to smallest group and the 5,000-10,000 group, but the smallest group was still one of the stablest.

d) *Conclusion*

Local contractors had a tendency to curtail man-hours by a proportionately large amount and thus to pass on the cycle in a magnified form. This is possibly due to their newness and lack of contacts on the Mainland — especially when compared to the greater stability of Mainland contractors. (See below.)

3) Mainland Autonomous

The emphasis in both periods was on firms with large curtailments of man-hours. In 1953-54 over 50 % of the firms were in the more than 60 % decline category. There was some mellowing in the second period with relatively small increases in the 0-40% curtailment category, but there was also a very large increase in the 80% - 100% curtailment category.

a) *Market Orientation*

There was a shift in emphasis between the two periods. During 1953-54, 75 % of the firms were Mainland-oriented; but with the substantial increase in the number of firms in the industry between the two periods, the emphasis shifted on to locally-oriented firms which in 1957-58 constituted 60 % of all the firms. The heavy accent on drastic declines in the first period is not fully explained by the Mainland orientation, where the general emphasis on firms with strong declines in man-hours was not as heavy. The increase in the proportion of firms with mild declines in the second period can be partially explained by the greater orientation toward the local market, while the heavy increase in the number of firms curtailing operations by 80 % - 100 % could be due to the 40 % still oriented to the Mainland, in whose general category there were relatively more firms at the extreme end.

b) *Industry group*

During the first period there was an emphasis on the Miscellaneous group, with a number of firms in electrical machinery and the textiles. By 1957-58 the growth in the number of firms was characterized by a spread over almost the whole spectrum of the industry groups. The most notable growth was in the Rubber, Stone, Clay, and Glass, Fabricated Metal Products, and Furniture industries. The Rubber industry had the largest proportion of firms in the smallest decline categories, while the other three industries were fairly evenly balanced, inclining only slightly to the heavy curtailment rate. The Miscellaneous sector, which is still the most dominant, had a larger percentage of firms in the heavily declining group than in the previous period. It therefore could be inferred that this category's small increase in the lightly declining group was due to a rise of the Rubber and Stone, Clay, and Glass Products industries, and the strong increase at the other extreme to the Miscellaneous and Electric Machinery industries.

c) *Size*

Mainland Autonomous firms were predominantly small in both periods. In the second period most of the increase occurred in

the 0-1,000 man-hour group, with most of the rest following in the next two size groups. Since all these size groups experienced a greater degree of declines in the second period, it would seem that their possible influence on this category of firms was in the growth of the number of firms in the large declining group.

d) *Conclusion*

The policies of Mainland Autonomous firms were such as to pass on cycles in a magnified form in the first period, whereas in the second period the shift was such as to make policies more «neutral», i. e., neither exaggerating nor minimizing fluctuations. If the growth of firms in the newly important industries should continue, the movement toward even smaller general fluctuations emanating from this category should continue. Thus the most important influencing variables are the market orientation and the industry group.

4) *Mainland Affiliated*

This is the largest group and had the most even distribution of firms according to percentage man-hour curtailment. During the 1953-54 period, the balance was slightly inclined toward the larger curtailment group, and this tendency continued with slightly more emphasis in 1957-58.

a) *Market Orientation*

In both periods the majority of the firms catered to the Mainland market, although there has been a 10 % increase of the firms selling in the local market in the second period; this still leaves over 75 % of the firms in the Mainland-oriented group. From the tabulation percentage of the size of man-hour decline, we would thus expect a somewhat greater amount of firms in the large-decline category in the first period, and a somewhat smaller number in the second period than actually occurred. Hence we suspect that market orientation is not a principal independent variable.