Colombian Development Policy

Richard R. Nelson, Robert L. Slighton and T. Paul Schultz

December 1969

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A REPORT PREPARED FOR

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The RAND Corporation
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What are the effects of the Colombian foreign exchange disequilibrium and what are the macro policy options of the Colombian government?

The contention of the study is that the continued lack of progress in dealing with exchange disequilibrium is partly the result of persistent differences of opinion as to how the Colombian economy actually works and partly the legacy of the past failures of certain policies that were inappropriate in an environment characterized by domestic price instability and structural disequilibrium.

Colombia has been experiencing a recession, on and off, for the last 5 or 6 years. The principal characteristics of this recession have been a slowing down of the rate of growth of employment and output in the modern sectors of the economy, an increase in overt urban unemployment, and a resurgence of low productivity and low-wage craft firms. The basic cause is that the supply of foreign exchange has not been sufficient to permit the economy to operate at near capacity and invest at a relatively high rate. The root of the problem is the government's policy response to the fall in coffee prices in the mid 1950s. In the short run, formal equilibrium has been maintained through a "disequilibrium" system of quantitative exchange and import restrictions. The long run solution has been sought in terms of an intensified policy of import substitution. Because the policy of import substitution has been indiscriminate, the manufacturing sector is dotted with firms that are able to survive only under the umbrella of super tariffs or import prohibition. As a result of the disequilibrium system, the Colombian peso has been overvalued, the incentive to develop new export markets has been depressed, and monetary-fiscal instruments have been used primarily to help preserve exchange reserves rather than as a means of achieving growth objectives. Perhaps even more important, the disequilibrium system has dulled perception of the basic problem, for many observers have attributed the cause of the current economic stagnation to inadequate aggregate demand. Although this is quite correct, the principal reason for the deficiency of aggregate demand is the unavailability of foreign exchange.

The major conclusion of the study is that almost all of the higher order economic policy objectives are furthered by, and to a large extent are dependent upon, prior achievement of a relatively open economy with the exchange rate rather than quantitative restrictions playing the dominant role in equilibrating supply of and demand for foreign exchange. Given the magnitude and structural characteristics of exchange disequilibrium in Colombia, such a policy reform cannot be accomplished quickly.

The goals of a relatively open economy and the dismantling of the disequilibrium system require at least three important policy changes: First, the rate of exchange on commodity transactions should increase at a somewhat faster rate than the pace of domestic inflation and should continue to do so until the actual rate of exchange and the shadow rate (the estimated equilibrium rate) approximately converge. Second, the difference between the *effective* exchange rate (the nominal rate adjusted for taxes and subsidies) and the nominal rate should be increased substantially for minor exports. Third, the dispersion of nominal tariff rates should be greatly reduced, and the list of goods whose import is prohibited should be shortened.

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This report is the concluding document in a series of Rand studies of Colombian development designed to help AID formulate policy and improve resource allocation in Colombia.

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This study is presented as a competent treatment of the subject, worthy of publication. The Rand Corporation vouches for the quality of the research, without necessarily endorsing the opinions and conclusions of the authors.

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PREFACE

THIS REPORT is the concluding document to the series of studies of the Colombian economy undertaken at The RAND Corporation under the sponsorship of the United States Agency for International Development, with supplementary funds provided by the Corporation. Portions of this Report draw heavily on material published in earlier Memoranda. A significant part, however, represents the results of new research. The basic document for Chapter III of this study is Richard R. Nelson's *A Study of Industrialization in Colombia: Part I, Analysis*, RM-5412-AID, December 1967; Chapters III and IV are an outgrowth from what was to have been Part II of that study. The theoretical background to Chapter III is Nelson's Memorandum, *The Effective Exchange Rate, Employment and Growth*, RM-5680-AID, December 1967; the discussion of current issues of foreign exchange policy and the empirical analysis in that chapter is a summary of previously unpublished research by Robert L. Slighton. Chapter IV is derived largely from two studies by Robert L. Slighton, *Urban Unemployment in Colombia*, RM-5393-AID, January 1968, and *Relative Wages, Skill Shortages, and the Distribution of Income in Colombia*, RM-5651-AID/RC, November 1968; and a study by T. Paul Schultz, *Returns to Education in Bogota, Colombia*, RM-5645-RC/AID, September 1968. Chapter V is closely related to another study by T. Paul Schultz, *Population Growth and Internal Migration in Colombia*, RM-5765-RC/AID, March 1969.

Although the broad commission of RAND's research effort was to identify and investigate policy options for U.S. foreign assistance strategy in Colombia, the focus of attention of this Report is on the macro policy options of the Colombian government. The reason for this emphasis lies in the fact that Colombia is not only less developed in

terms of per capita income, but it also suffers from a profound disequilibrium in its economic relationships with the rest of the world. The recent focus of AID policy on program loans is an explicit recognition of this disequilibrium. In spite of the essential correctness of the AID diagnosis, however, the extent of the Colombian foreign exchange disequilibrium remains unabated. The contention of this Report is that the continued lack of progress in dealing with exchange disequilibrium is partly the result of persistent differences of opinion as to how the Colombian economy actually works and partly the legacy of the past failures of certain policies that were inappropriate in an environment characterized by domestic price instability and structural disequilibrium. This Report was written in the hope that it will reduce some of the critical uncertainties as to how the Colombian economy is likely to respond to policy change and, in this manner, contribute to a more fruitful dialogue between the Colombian government and the consortium of international lending institutions.

The theme of the policy package recommended in this Report is that satisfactory progress toward the long run objective of economic growth is dependent on satisfactory progress toward the medium run goal of eliminating that structural disequilibrium whose most immediate expression is excess demand for foreign exchange. Nevertheless, certain policy issues that are chiefly relevant to considerations of long run growth of per capita income have also been considered. Although the Report is meant to be comprehensive, it does not claim to be an exhaustive discussion of all economic policy issues in Colombia. The agricultural sector is not discussed. Neither is there any attempt to discuss monetary-fiscal policy except in very general terms, since the specific policy issues in this field are essentially short run problems that lie outside the time frame felt to be appropriate for this study.

The authors are indebted to more individuals than can conveniently be identified within the confines of this preface. They would particularly like to thank William Rhoads and Francis Masson of USAID, Bogota; Lester Taylor, Richard Porter, and Karsten Laursen of the

Harvard Development Advisory Service; Antonio Urdinola of the Departmento Administrativo de Planeacion of the Colombian government; Miguel Urrutia Montoya, now asesor to the Junta Monetaria; Lauchlin Currie; and Richard Maullin and Leland Johnson of The RAND Corporation, for many useful suggestions. The conclusions offered here are, of course, the responsibility of the authors.

SUMMARY

COLOMBIAN ECONOMIC DEVELOPMENT has entered a new phase. The country has been experiencing a recession, off and on, for the last five or six years. The principal characteristics of this recession have been a slowing down of the rate of growth of employment and output in the modern sectors of the economy, an increase in overt urban unemployment, and a resurgence of low-productivity and low-wage craft firms. Although the symptoms of the Colombian malaise are complicated, the basic cause is not. The supply of foreign exchange has not been sufficient to permit the economy to operate at near capacity and invest at a relatively high rate.

The roots of this problem go back to the fall in coffee prices in the mid 1950s. The Colombian government's policy response to this trauma has been twofold. In the short run, formal equilibrium has been maintained through a "disequilibrium" system of quantitative exchange and import restrictions. The long run solution has been sought in terms of an intensified policy of import substitution. Because the policy of import substitution has been indiscriminate, the manufacturing sector is dotted with firms that are able to survive only under the umbrella of super tariffs or import prohibition. As a result of the disequilibrium system the Colombian peso has been overvalued, the incentive to develop new export markets has been depressed, and monetary-fiscal instruments have been used primarily to help preserve exchange reserves rather than as a means of achieving growth objectives. Perhaps even more important, the disequilibrium system has dulled perception of the basic problem, for many observers have attributed the cause of the current economic stagnation to inadequate aggregate demand. Although this is quite correct, the principal

reason for the deficiency of aggregate demand is the unavailability of foreign exchange.

Our major conclusion is that in Colombia, almost all of the higher order economic policy objectives are furthered by, and to a large extent are dependent upon, prior achievement of a relatively open economy with the exchange rate rather than quantitative restrictions playing the dominant role in equilibrating supply of and demand for foreign exchange. Given the magnitude and structural characteristics of exchange disequilibrium in Colombia, such a policy reform cannot be accomplished quickly. If the development stabilization programs of the international lending consortium continue to bear the imprint of the goal of *quick* achievement of a quasi free market exchange system, the Colombian government will probably continue to view the foreign exchange problem as an exercise in short run crisis management that requires maintenance of most of the elements of the disequilibrium system.

The goals of a relatively open economy and the dismantling of the disequilibrium system require at least three important policy changes: First, the rate of exchange on commodity transactions should increase at a somewhat faster rate than the pace of domestic inflation and should continue to do so until the actual rate of exchange and the shadow rate (the estimated equilibrium rate) approximately converge. Second, the difference between the *effective* exchange rate (the nominal rate adjusted for taxes and subsidies) and the *nominal* rate should be increased substantially for minor exports. Third, the dispersion of nominal tariff rates should be greatly reduced, and the list of goods whose import is prohibited should be shortened.

An increase in the real exchange rate -- the actual certificate rate deflated by an index of domestic prices -- is needed to improve the incentives to export and produce import substitutes and to encourage the substitution of domestic labor for imported capital. This policy reform is also a prerequisite to the adoption of a monetary-fiscal policy that is appropriately expansionary. This devaluation of the real exchange rate must be gradual, however. Given the nature

of the relationship between prices and wages and the essential fragility of government control over the money market, the existing disequilibrium gap in the foreign exchange market is much too large to close in one quick round of devaluation and decontrol.

Although an increase in the certificate rate would lead to some increase in prices, there is evidence that *gradual* devaluation need not lead to a rate of price increase of manufactured goods in excess of the rate implied by a simple shifting forward of direct and indirect import costs. The ratio of total import content to value of output in manufacturing being currently somewhat less than 20 percent implies that a 5 percent exchange depreciation would result in at most a one percent increase in the price of manufactured goods. With a "normal" rate of inflation between 7 and 12 percent per year, the additional inflationary impact of a gradual increase in the real exchange rate is not likely to be a major problem.

The expansion of exports other than coffee is of such immediate importance to the development potential of Colombia that the differential between the effective and nominal exchange rates for minor exports should also be increased. This increase could be achieved either through larger tax rebates or an explicit exchange differential. The elasticity of response of Colombian exports is such that a 10 percent devaluation of the real effective exchange rate on minor exports is likely to lead to an 8 to 10 percent increase in their dollar volume within a few months of the devaluation. The extreme variability of the real exchange rate for exports in recent years precludes measurement of medium or long run response, but the experience with agricultural exports in the 1950s suggests a much higher elasticity of response over longer periods.

The degree of dispersion of nominal tariffs in Colombia is excessive. Since tariffs on final products tend to be higher than the rates on intermediate goods, the effective level of protection is even higher than the nominal level. Colombia would do well to move toward a policy of a uniform tariff subject to temporary exemptions, the criteria for exemptions to be limited in number and more or less

automatic in their application. Rates in excess of the uniform rate should be limited to a maximum well below the current maximum rate and should decline through time according to a prespecified schedule. Super tariffs originating in the Colombian government's notions as to social priorities should be converted to excise taxes that are applicable to all goods, imported and domestic.

Trade liberalization in the form of reducing the number of goods on the prohibited list should have high priority, but this must be approached cautiously. The criteria for this form of trade liberalization should be stated in terms of a particular rate of increase of the certificate rate rather than in terms of the number of items free from licensing restrictions.

In recent years, fiscal-monetary policy in Colombia has been dominated by the need to sustain foreign exchange reserves, and excessive reliance has been placed on monetary techniques in attempts to deal with issues that are properly matters of foreign exchange policy. A simultaneous frustration of growth and stabilization objectives has occurred. The credit squeeze imposed on the private sector has resulted in some dampening of import demand, but it has also depressed the demand for domestic products and reduced the incentive to invest. A more appropriate foreign exchange policy would permit fiscal-monetary instruments to be used in a suitably expansionary way, and the problem of reducing the high cost of financial intermediation could be tackled. Poor choice in foreign exchange policy has crippled the freedom of choice of fiscal-monetary instruments.

An important reason for the inappropriateness of a policy of fixed nominal exchange rates in Colombia is the rapidity of wage drift. This wage drift is chiefly a phenomenon of the modern sectors, for the Colombian urban wage structure shows a strong trend of splitting into two parts, with high and rapidly rising wages in the modern areas and low and (at best) slowly increasing wages in the traditional sectors. This breaking apart of the wage structure poses severe distributional and political problems. The wage drift in the modern sectors requires a substantial rate of depreciation of the certificate

rate of exchange if Colombia's ability to develop exports or import substitutes is not to be impaired, yet the depreciation of the exchange rate results in price increases that are distributed over the entire economy, including those sectors where wage rates are fairly stable.

These trends in labor costs and wage patterns are causing severe policy problems, but they are more the result of the protected monopoly position of much of Colombian industry and the exercise of union bargaining power than of government labor policy. Although a number of changes in the labor code are desirable, the key to price-wage restraint is a toughening of government resolve not to isolate Colombian industry so completely from the threat of competition from imports. In the current environment an incomes policy can play only a limited role, but it is nevertheless important that the government weaken the conviction of both labor and management that increases in wage costs can be passed on as price increases. A constructive step in this direction would be a coordination of price controls and wage arbitration proposals for those firms that are believed to play an important role in determining wage-price trends. A selective but vigorous implementation of government authority with respect to price control and wage arbitration would be far more effective than the present system of *pro forma* control of a wide range of prices.

A further characteristic of the current economic stagnation in Colombia is that most types of trained manpower appear to be in excess supply. This situation may be a phenomenon of recession rather than an indication of secular imbalance of supply and demand, but we believe there are long run implications for educational policy. In particular, although the average rate of return on investment in higher education of the present quality and distribution of fields appears to be very low, a high rate of return to advanced education of high quality may exist in some areas. Even with recession there is a strong demand for persons capable of moving into high level management jobs. The chief bottleneck today to the expansion of "professionalism" in business management is probably the limited capacity of the educational system

to train management specialists. In the field of vocational training, the crisis phase of the development of a supply of skilled blue-collar workers is over. The need now is to secure a better fit between the patterns of enrollment and demand and to upgrade course quality. The evidence is that an increasing premium is being placed on quality at virtually all skill levels. This trend is not simply a response to a situation of generalized excess supply. It also represents a change in managerial perception of the way in which labor enters into the production process.

This increase in the premium paid for workers of relatively high quality underscores the fact that the industrial development process involves technological change as much as it does capital accumulation. Yet most Colombian firms are limited in their access to high level technical assistance to arrangements with foreign equipment suppliers or parent firms. It is perhaps for this reason that a shortage of high level technicians is often alleged. At the present time, however, the actual demand for such personnel is probably not sufficient to provide employment for the great bulk of new technical graduates in occupations that would fully utilize their capabilities. Our suspicion is that the long run social returns to a growing pool of high level technical talent is far above short run private returns, and that private perception of these returns is distorted by a lack of "professionalism" in management. In this circumstance, a significant increase and improvement in the public technical information and consulting machinery is needed. In the short run an institution chartered to provide technical assistance to private industry could help alleviate the problem of emigration of high level manpower. In the long run it could help increase the rate of technological diffusion. A strong mechanism for inducing utilization of the service will be needed initially, however. One such mechanism is a technical audit and consulting arrangement as a prerequisite for access to public credit programs.

The Colombian economy is divided into two sectors: one in which technology is essentially static; and another in which technology

evolves continuously over time. Given this dual structure, the most important index of progress in increasing average welfare will be the rate of growth of employment in the modern subsectors relative to the growth of population and the labor force. Yet in the absence of large scale public programs aimed at population control, the population increase in Colombia over the next four decades or so will be such as to require unprecedentedly large increases in employment in the modern sector just to maintain current average income levels. There is little doubt, however, that the Colombian government could effect a considerable reduction in the birth rate within the next decade if it were to decide to implement a large scale family planning program. Although it remains to be shown precisely how public programs of various designs and intensities differ in effectiveness in accelerating the rate of diffusion of contraceptive practice, there is good evidence that such programs have a quantitatively important effect on reproductive behavior. Evidence from family planning programs in Korea and Taiwan suggests that diffusion of contraceptive knowledge through public programs can equalize the frequency of contraceptive use among diverse social and economic classes within two years. The quick success of these programs derived from the initial condition that Korean and Taiwanese families were having more children than they wanted. There is good reason to believe that this condition also holds in Colombia. In Bogota about 65 percent of the women interviewed reported that they did not want any more children. The corresponding figure for Taiwan is 45 percent. Even if a reduction in the birth rate were achieved very quickly, Colombia will still see an extremely rapid increase in the labor force for the next twenty years. Nevertheless, there is good reason to believe that a vigorous population policy could yield beneficial results in the short run. A reduction in the birth rate would probably result in an increase in the propensity to save. It would also take some of the strain away from Colombia's sorely taxed educational resources and permit a higher average level of educational investment in new additions to the labor force.

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I. WHERE COLOMBIA STANDS TODAY: THE CURRENT MALAISE AND THE POLICY PROBLEMS FOR THE LONG RUN

COLOMBIAN ECONOMIC DEVELOPMENT is now in a new phase. Much of the optimism regarding future growth prospects and self-confidence in policy prescriptions that marked the early 1960s is now gone.[1] The difficulties of achieving rapid development are being appraised more realistically, and a greater understanding of the necessity to be experimental and pragmatic in policy making has been acquired. Some of the new policy departures seem quite promising.[2] But none of the recent policy dialogues points very clearly toward integrated and radical restructuring of Colombia's development strategy that seems called for.

One purpose of this Report is to map the outlines of such a restructuring. This introductory chapter will be concerned with a diagnosis of Colombia's present economic malaise and a broad statement of the long run policy problem. Chapter II is a theoretical discussion of the nature of the relevant economic and political relations and constraints. It can be, but should not be, read separately from the rest of the text. The remaining chapters will discuss a number of specific policy areas in some detail -- a set of policies that adds up

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[1] The 1962 National Development Plan presented low and high alternative growth projections of 5.7 percent and 6.5 percent. These estimates were made during the era when Colombia was identified as "the showcase of the Alliance for Progress." Although the official data for 1967 are not yet available, the actual rate of growth of gross national product since 1962 has probably averaged about 4.4 percent. Personal income has grown at a lesser rate.

[2] In particular we refer to the government's resolve not to try to aim for a fixed nominal exchange rate.

to a feasible and promising restructuring of Colombia's development strategy. Although we have dealt with a broad set of policy issues, we make no claims of having explored every relevant policy problem. The strategy presented divides into three related, but separable, substrategies.

Chapter III advocates a policy of permitting a significant increase in the real effective exchange rate and progressively opening up the economy to external competition. This prescription scarcely is novel. That it is not novel does not make it any easier to implement. But neither does it make it any less necessary. Without such a change, we do not see how a country of Colombia's present resource endowments and size can hope to improve its economic performance significantly.

Chapter IV is concerned with domestic factor prices and productivity -- in particular, labor costs and labor quality. Here we explore the question of whether a politically difficult incomes policy may be an alternative to a politically difficult quasi-equilibrium exchange system, and again come back to the importance of opening up Colombia to the latent threat of external competition. We also examine certain directions for educational policy and a policy to speed up the diffusion of technological knowledge.

Chapter V is concerned with the problem of population policy. We have attempted to identify a variety of indirect ways of making headway with the problem in the hope that some of the approaches may prove politically feasible.

The Current Malaise and Its Proximate Cause

Various of our studies have provided strong evidence that Colombia has been experiencing a recession, on and off, for roughly the past five years.[1] The principal characteristics of the recession have

[1] R. Slighton, *Urban Unemployment in Colombia: Measurement, Characteristics, and Policy Problems*, RM-5393-AID, January 1968; R. Nelson,

been a significant slowing down in the growth of employment in large scale modern manufacturing, an increase in overt urban unemployment, and a resurgence of low productivity and low wage craft firms. There is evidence of inadequate demand to sustain rapid growth. Compounding these effects and confusing the evidence of aggregate demand deficiency has been a set of quantitative controls on access to foreign exchange and, to a lesser extent, to domestic credit. These controls strangle the ability of the Colombian manufacturing sector to increase output and employment.

The inability of the Colombian government to cope with this complex set of symptoms has resulted in the loss of much of the public optimism and self-confidence of the early 1960s. Yet although the symptoms are complicated, we think that at least the proximate cause is not. It is, very simply, a supply of foreign exchange that is not sufficient to permit the manufacturing sector to operate at near capacity and to invest at a higher rate -- and the government policy response to that shortage. The way that the import availability constraint binds Colombia's ability to produce and invest was discussed in some detail in our earlier work.[1] The conclusion that lack of foreign exchange is the binding constraint on growth agrees with the findings of Vanek, and Chenery and Eckstein.[2] It does not imply, however, that Colombia's economic problems can be solved simply by increasing the net flow of international public credit.

A Study of Industrialization in Colombia: Part I, Analysis, RM-5412-AID, December 1967; R. Slighton, *Relative Wages, Skill Shortages, and Changes in Income Distribution in Urban Colombia*, RM-5651-AID, November 1968; R. Nelson, *The Effective Exchange Rate, Employment, and Growth in a Foreign Exchange Constrained Economy*, RM-5680-AID, November 1968. (All published by the RAND Corporation.)

[1]See in particular Part IV of R. Nelson, *A Study of Industrialization in Colombia, Part I, Analysis;* and *The Effective Exchange Rate, Employment, and Growth in a Foreign Exchange Constrained Economy.*

[2]J. Vanek, *Estimating Foreign Resource Needs for Economic Development*, New York, McGraw-Hill, 1967; H. Chenery and P. Eckstein, *Development Alternatives for Latin America*, unpublished paper.

The roots of Colombia's difficulties go back to the fall in coffee prices in the mid 1950s, but the magnitude of the problem did not become fully apparent until the early 1960s. By then it was, or should have been, apparent that not only was the change in Colombia's terms of trade likely to be permanent, but that a policy of indiscriminate import substitution could not solve the foreign exchange problem. During the 1958-1961 period the intermediate goods import coefficient fell substantially, but the general expansion of industry was such as to require an increase in the total import of intermediate goods. The initiation of large scale international public lending permitted Colombia to increase the level of gross investment in spite of the ever-increasing demands for intermediate good imports, but by the mid 1960s Colombia's demand for foreign exchange (given her growth targets and exchange allocation patterns) had outrun her sources of supply.

Obscuring this development were the consequences of certain unfortunate decisions as to fiscal, monetary, and exchange rate policy. The increase in the money supply in 1961 and 1962 and budgetary problems led to a change in price expectations that provoked a foreign exchange crisis in late 1962. Unlike the problem of increased structural disequilibrium resulting from indiscriminate import substitution, running out of foreign exchange compels action of some kind. The classic remedy of devaluation was applied, but tactical mistakes in the arrangements for securing the devaluation, a large liquidity overhang, and approval of a huge increase in the minimum wage conspired to bring about an inflationary spiral that eroded most of the change in the "real" exchange rate within six months of the devaluation. The combination of an expansionary budget policy, a slowdown in foreign public lending, and a fixed exchange rate policy led to a further exchange crisis in 1965. The resolution of that crisis, although politically adept, underestimated the full extent of the exchange disequilibrium, and a further fall in coffee prices was enough to bring about another crisis in late 1966. The exchange situation has been "stabilized" since then largely through the imposition of tight quantitative restrictions on imports and capital export.

As the economic crisis has deepened, Colombian economic policy has been increasingly focused on the problem of short run management of foreign exchange reserve crises. The resultant policies have preserved the formal solvency of the nation, but they have dulled perception of the basic economic problems and have therefore hindered progress toward their solution. Heavy reliance on quantitative import restrictions and periodic squeezes on the supply of credit to the private sector have developed the illusion that supply of and demand for foreign exchange are nearly in balance. Colombian success in maintaining net exchange reserves at levels that are satisfactory to the International Monetary Fund has obscured the fact that aggregate demand is insufficient and that unemployment and idle plant capacity are therefore increasing.

The causes of this demand slack are complex, but the root of the problem is the fundamental disequilibrium in the exchange market. The low level of private investment in recent years reflects both the difficulty of acquiring exchange for the import of capital goods and the shift in profit expectations that is entailed in the continued rationing of imported intermediate goods. This shift in the expected returns to investment has been so profound that even when import restrictions are temporarily eased, there is little incentive to expand output capacity. Some policy makers have concluded that the major problem is deficient aggregate demand and that foreign exchange availability is not a serious restraint on expansion. And they are right, except that the principal reason private demand is limited is the government's policy response to foreign exchange shortage.

In an economic environment not characterized by foreign exchange shortage an aggregate demand deficiency originating in a decline in private investment could be alleviated by increasing the size of the public sector budget. Indeed, that is the remedy urged by some Colombians. Yet here again the exchange constraint is operative, for even if public investment projects could be assumed to have no direct import content, the secondary income effects would result in a substantial indirect increase in import demand. The answer to Colombia's

economic ills is thus not just simply a matter of letting demand rip. It is a matter of somehow finding a way to reduce the excess demand for foreign exchange without resort to a complex set of quantitative restrictions.

The Long Run Policy Problem: Restructuring the Colombian Manufacturing Sector

The statement that a shortage of foreign exchange is the proximate cause of current economic problems is in itself insufficient to serve as the basis for policy prescription. One must examine what lies behind the chronic foreign exchange shortage. In the past the tendency has been to concentrate criticism on the exchange rate itself. The current fashion is to criticize the mechanism of exchange policy, in particular, the system of quantitative restrictions. Both types of criticism have been and continue to be valid, but they do not go far enough. The problem lies with the disequilibrium system as a whole -- fixed or sluggish nominal exchange rates, quantitative restrictions, and tariff rates that are sufficiently high to prohibit the import of most goods that might compete with domestic products. This disequilibrium system, partly conceived as a development strategy and partly a legacy of a tradition of crisis management, has resulted in a chronically overvalued exchange rate, a manufacturing sector that increasingly is dotted with firms that are able to survive only under the umbrella of super tariffs or import prohibition, and a tradition or psychological predisposition to autarchy that has depressed the incentive to export.

The major point we wish to stress is that the fall of coffee prices in the mid 1950s did not simply pose a short run foreign exchange crisis for Colombia; it posed a long run problem, and the government's decision to respond with redoubled efforts to encourage import substitution (the intended long run solution) and quantitative trade restrictions (the short run solution) at once tended to exacerbate and obscure the original problem. Perhaps the most serious

deficiency of Colombian policy response has been the bias toward import substitutions as opposed to export promotion.[1] Colombia's import coefficients are typical of countries at the same stage of development (as measured by per capita income or percentage of the work force in manufacturing). What is unusual is that Colombian export earnings are actually less today than in the mid 1950s.[2] The failure of the supply of foreign exchange to grow has forced a series of emergency measures to prevent foreign exchange drain -- measures that have provided an extraordinary degree of protection to many industries capable of producing import substitutes. As a result, the import substitution thrust has been far more indiscriminate than it would have been if it had been a conscious long run policy to bias the evolution of the structure of production. One obvious consequence has been a sharp increase in the amount of investment associated with a given increase in employment and a given increase of output.[3] Although part of this increase in excess capacity is undoubtedly the result of the slack demand the economy has experienced in recent years, part is certainly the consequence of the composition of new investment.

The solution to these problems lies in a gradual replacement of resource allocation by administrative action with allocation through the price system and a gradual reduction of the differences between domestic and international prices. We want to emphasize the necessity of viewing the adjustment process in relatively long run terms. Part

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[1]The effective exchange rate on minor exports today is less than it was in 1957 if it is deflated by an index of the cost of manufacturing.

[2]In examining 29 less developed countries for which export data were available, Chenery and Strout found only six that failed to achieve some increase in the dollar value of their exports over the 1957-1962 period. Only two experienced a greater decline in export earnings than Colombia. See H. Chenery and A. Strout, "Foreign Assistance and Economic Development," *American Economic Review*, Vol. LVI, No. 4, September 1966, pp. 712-713.

[3]For a good discussion of import substitution through 1964 see A. Urdinola, *Estudio de la Industria Fabril*, Bogota, Departamento Administrativo de Planeacion, 1966.

of the failure of the policies suggested by the international lending agencies in the past must be ascribed to an excess optimism as to the length of time required to reestablish an equilibrium system (and a relatively open economy). There is good reason for quick action, however. The longer the problem is perceived as crisis management the harder it will be to solve. The disturbing trends described above in part reflect the fact that under the umbrella of the disequilibrium system a large number of high cost firms have grown up with close to a monopoly in a small domestic market. These firms have a strong vested interest in continuation of at least the protection part of the government's policy package. Fortunately, what is needed most in the longer run is not so much elimination of the inefficient firms that have been spawned by the system to date but a rapid increase in the number of firms that can hold their own in the absence of protection.

One purpose of this Report is to discuss the probable economic effects of various changes of economic policy in Colombia, not to examine the direct consequences of alternative assistance strategies in that country. Nevertheless, we believe that this study has one implication with respect to the consequences of development aid in Colombia that is of such fundamental importance that we would be derelict in not stating it directly. That is, foreign assistance is a two-edged sword. Until the Colombian authorities take the hard policy decisions necessary to reduce the present structural imbalances in the economy, continued large scale public lending may increase these distortions and thus intensify the country's dependence on foreign assistance. On the other hand, the long run benefits, in terms of increased output and employment, of appropriate policy changes would be very large, and the likelihood of such reforms is closely related to the policies of international lenders.

II. OBJECTIVES, CONSTRAINTS, AND THE ROOM FOR POLICY MANEUVER

THE DESIGN of sensible policies to relieve retarded development requires consideration of two related, but separable, sets of issues. First, what do we know, or think we know, about the nature of the industrialization process in less developed countries that provides guidance for policy? Second, what do we know, or think we know, regarding the capability of government to influence the development process? These sets of questions will be explored below.

Growth as a Process of Structural Transformation: Some Implications for Policy

The nature of the policies that one would advocate as likely to induce rapid and efficient development depends of course on one's beliefs about the important constraints and relations of the development process. Our views on policy are heavily colored by our belief that manufacturing development essentially is a process of structural and technological transformation.[1] This model of the process has many elements in common with the widely used development models. For looking at short run problems, most of the differences may not be important. But for looking at long run development, the structural-transformation view of the development process differs significantly in several respects from that of the more conventional formulations, and some of these differences appear to carry important implications for policy.

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[1] See, for example, R. Nelson, *A Study of Industrialization in Colombia;* and R. Slighton, *Relative Wages, Skill Shortages, and Change Changes in Income Distribution in Urban Colombia.*

Differences in Analysis

The material treated in most development texts and courses includes a wide variety of models, many of them in conflict with each other, but the vast majority of development programming models rest on neoclassical growth theory and its activity analysis (sometimes simple input-output) relative. There are three broad ways in which the theory tends to be used. First, it is used in relatively aggregative form for exploring the factors that lie behind international productivity differences and differences in growth rates. Second, the model is used, both in macroeconomic and microeconomic form, to estimate the input requirement of a given growth rate. Finally, the model is used in microeconomic form to identify allocations of resources that are, in some sense, optimal. Our discussion will focus on the first or explanatory use, for it is basic and lies behind the other two uses.

In its version as an explanation of cross country productivity differences, the theory primarily focuses on the effects of differences in capital per worker and the educational attainment of the work force. It explicitly allows factor substitution. The work of Arrow, Chenery, Minhas, and Solow is a prominent example.[1] Without going fully into the technicalities, it is clear that although the model certainly explains a considerable portion of observed inter-country productivity differences, there is a lot left unexplained.[2]

As of 1964, output per worker in U.S. manufacturing was roughly four times that in Colombia. There also was a roughly fourfold difference in capital per worker and, as shown in Table 1, great differences in the educational attainments of the work force. If we make

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[1] K. Arrow, H. Chenery, B. Minhas, and R. Solow, "Capital Labor Substitution and Economic Efficiency," *Review of Economics and Statistics*, Vol. XLIII, No. 3, August 1961.

[2] For a detailed discussion see R. Nelson, "International Productivity Differences in Manufacturing Industry: Problems with Existing Theory and Some Suggestions for Theoretical Restructuring," P-3720-1, Santa Monica, The RAND Corporation, January 1968.

Table 1

DISTRIBUTION OF THE WORK FORCE BY LEVEL OF EDUCATION, COLOMBIA AND THE UNITED STATES

	United States 1960	Bogota (manufacturing) 1965	Index of Earnings in Manufacturing, Bogota, 1965
Some college	21	3	650
Secondary school graduation	24	6	420
Some secondary	36	21	195
No secondary	18	69	100

Source:

Bogota manufacturing data derived from CEDE labor force sample September 1965. U.S. date from *U.S. Census of Population 1960*, Subject Report, *Occupation by Earnings and Education*, Final Report PC(2)-7B, Washington, D. C., 1963.

some simple assumptions in the spirit of Denison[1] we can calculate that output per worker would be slightly more than doubled if capital per worker in Colombia were the same as in the United States; this factor alone explains about a third of the observed productivity difference. If we assume that the salary differentials by education level that currently exist in Bogota reflect differences in marginal productivity, we can calculate that output per worker would be one-third larger if the Colombian work force had an educational distribution roughly comparable to that in the United States. Under these assumptions, output per worker would be roughly three times as great as at present if both the capital-labor ratio and the educational distribution in Colombia were like that in the United States. This would reduce the existing productivity gap by about two-thirds.[2]

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[1] See E. Denison, *Why Growth Rates Differ*, Washington, D.C., The Brookings Institution, 1967.

[2] The assumptions behind the calculations are, first, a Cobb-Douglas production function

$$Q = A\, K^{\alpha}\, (L\,\bar{q})^{1-\alpha} ,$$

or

$$\frac{Q}{L} = A\, \left(\frac{K}{L}\right)^{\alpha}\, (\bar{q})^{1-\alpha} ,$$

where Q is output, L is labor input (hence (Q/L) is output per worker), K is capital (hence (K/L) is capital per worker), and $\bar{q}$ is an index of labor quality. Second, it is assumed that $\alpha = .6$. This is somewhat smaller than capital's share (.7) but it is clear that, because of monopoly elements and protection, the profit share is an overestimate of the elasticity of output with respect to capital. These assumptions directly permit us to estimate the increase in Q/L which would result from a fourfold increase in K/L as

$$\left(\frac{Q}{L}\right)_1 \Big/ \left(\frac{Q}{L}\right)_0 = \left[\left(\frac{K}{L}\right)_1 \Big/ \left(\frac{K}{L}\right)_0\right]^{\alpha} = 2.3.$$

Third, define the labor quality index as:

$$\bar{q} = C\left[\frac{L_1}{L} W_1 + \frac{L_2}{L} W_2 + \frac{L_3}{L} W_3 + \frac{L_4}{L} W_4\right]$$

where the labor categories are as in Table 1, and W_1 to W_4 are the earning indexes of workers in these categories. One can then calculate what

These results clearly must be taken with a grain of salt. They are quite sensitive to the various assumptions. If one worked with a CES model rather than a Cobb-Douglas and followed the suggestions of Arrow *et al.* that the elasticity of substitution is less than one, say .6, the differences in factor endowment would explain somewhat less. It also is likely that relative wage differentials would close considerably if Colombia had an educational distribution like that in the United States. To the extent that relative wages reflect relative productivity, this suggests that the calculations above overstate the effect on productivity of increased factor supplies alone. But although the quantitative results are sensitive to the specification of the model, the qualitative results are unlikely to be. It is clear that the neoclassical model explains a considerable amount, but it does not fully come to grips with the factors that are behind international productivity differences.

This qualitative conclusion and the rough quantitative results are similar to those of other studies that have used the neoclassical framework for exploring the factors behind international productivity differences. They are comparable to Denison's study of U.S.-European productivity differentials and Krueger's comparison of India and the United States, each of which showed significant differences that could not be explained in terms of neoclassical growth theory.[1]

It has been known for some time that the model also has only partial explanatory power regarding growth of productivity over time in different countries. Bruton's recent study of GNP growth in various

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$\bar{q}$ would be if the U.S. weights obtained: $\bar{q}$ would be about 2.1 times as great and output per worker would be one-third greater as

$$\left(\frac{Q}{L}\right)_1 \Big/ \left(\frac{Q}{L}\right)_0 = \left(\bar{q}_1 \Big/ \bar{q}_0\right)^{1-\alpha} = 1.33.$$

To estimate the total effect of both changes one must multiply the two separate effects.

[1] F. Denison, *Why Growth Rates Differ;* A. Krueger, "Factor Endowments and Per Capita Income Differences Among Countries," unpublished manuscript.

Latin American countries, including Colombia, is an excellent example.[1] It is well known that the growth of capital per worker explains only a small portion of growth of output per worker in the developed countries. It is interesting and significant that, with the exception of Mexico, growth of total factor productivity has tended to be lower in Latin America than in the more advanced countries. Even so, growth of total factor productivity accounts for a very large percent of growth of output per worker in Latin America. In Colombia over the last ten years it has accounted for roughly half.

The conclusions are similar if manufacturing output in Colombia is examined. Growth of (deflated) value added per worker in manufacturing has averaged roughly 3-1/2 percent a year over the period. Assuming a capital output ratio of roughly two, a ratio of gross investment to value added of about 14 percent, and a labor force growth of 3 percent, growth of capital per worker could not have exceeded 4 percent a year even assuming no depreciation at all. Assuming a depreciation rate of about 2 percent and an elasticity of output with respect to capital of roughly .6, we reach the conclusion that about one-third of growth of productivity is explained by growth of capital per worker.[2] Improvements in the educational attainments of the work

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[1] H. Bruton, "Productivity Growth in Latin America," *American Economic Review*, Vol. LVII, No. 5, December 1967.

[2] Again assuming a Cobb-Douglas relationship,

$$\frac{\Delta \left(\frac{Q}{L}\right)}{\left(\frac{Q}{L}\right)} = \frac{\Delta A}{A} + \alpha \frac{\Delta \left(\frac{K}{L}\right)}{\left(\frac{K}{L}\right)},$$

where $\frac{\Delta A}{A}$ refers to productivity growth not explained by growth of the capital labor ratio.

But $$\frac{\Delta \left(\frac{K}{L}\right)}{\left(\frac{K}{L}\right)} = \frac{\Delta K}{K} - \frac{\Delta L}{L},$$

and

$$\frac{\Delta K}{K} = \frac{I}{V}\frac{V}{K} - \delta,$$

force have proceeded rapidly over this period, but they appear to fall short of explaining the difference.

When one looks at manufacturing development as a structural transformation rather than a neoclassical process, total factor productivity differences across nations and the growth of total factor productivity in the development process are not mysterious at all. The structural transformation process model suggests that there are at least three major sub-processes involved. First, there is a innovation in an unconventional sense -- the decision (by someone who can directly or indirectly organize economic activity and who has access to resources) to invest in modern rather than in traditional technology. Second, there are learning phenomena internal to the innovating firm -- improvements resulting from accumulated experience on the part of management and the work force in operating with new technologies. Third, there are accommodation and adjustment phenomena outside the firm -- induced innovation and learning by suppliers and consumers and policy responses by government to facilitate the evolution of an environment where efficient operation of modern technology is possible and encouraged.

All these phenomena are intrinsically dynamic. Although the pace and efficiency may be constrained by the rate of growth of capital and the educational attainments of the work force, there is no necessary one-to-one relationship. The growth process involves but transcends simple capital and skill augmentation. And all three processes are important. Simple adoption of any modern technology is not enough. The system of incentives and constraints must be such as to stimulate the adoption of modern technology in those fields where it is best suited to the demand and supply environment of the country.

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where $\frac{I}{V}$ is the ratio of gross investment to value added (assumed .14), $\frac{V}{K}$ is the output capital ratio (assumed .5) and δ the depreciation rate (assumed .02). Thus $\frac{\Delta K}{K} = .05$. Assuming $\frac{\Delta L}{L} = .03$, and $\alpha = .6$, growth of capital per worker can explain a growth of productivity of roughly .012 a year.

It should also facilitate and spur the internal and external learning and adjustment process so that the latent advantage of modern technology is in fact realized.[1]

The "import-requirements" growth model obviously is closely akin to the neoclassical model discussed above, although for computational purposes the model usually is formulated with fixed coefficients (or coefficients fixed except for a trend). The Vanek model of Colombian foreign assistance requirements and the Chenery-Eckstein model are prominent examples of this class.[2] The fact that the input-requirements models, focused as they are on certain inputs or allocations that are associated with growth, do not totally explain this growth, is not sufficient reason to throw them out. All that is required for the model to be useful is that the relationship between certain inputs and output or growth of output be relatively stable, not that the growth of input fully explains the growth of output. If the pattern of evolution of an economy is relatively continuous, then stability of these relationships might well be expected. However, if the focus of attention is on policy to change the characteristics of development, say to speed up aggregate growth and effect a significant change in the composition of activity, then one would not expect past statistical relationships to perform well. These are the circumstances that characterize the present Colombian development process. The process of structural transformation is, and must be, so rapid that it is likely to be very difficult to predict the future on the basis of statistical relationships estimated from the past.

The final broad class of models that should be considered briefly are the microeconomic programming models that attempt to estimate

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[1]Baranson has provided an extremely interesting case study of how the policy environment can cripple the capability of a firm using modern technology to develop efficiency. See J. Baranson, *Technical Adjustment to a Developing Economy: A Study in the Transfer of Technology by an International Corporation,* Indiana University Ph. D. dissertation in Economics, 1966.

[2]J. Vanek, *Estimating Foreign Resource Needs for Economic Development;* H. Chenery and P. Eckstein, *Development Alternatives for Latin America,* unpublished paper.

optimal growth or allocation patterns. The Adelman-Sparrow model for Colombia is one such example.[1] Here the failure of the model to deal with innovation and learning is especially serious. The model in its applied form is forced to work with past input-output relationships, but the very nature of the development process is that these relationships will change. Indeed, the more successful is development the more they will change. The problem is compounded by the fact that it is absolutely essential that the economy be viewed as open and that the analysis attempt to identify areas of evolving comparative advantage.

Some Implications

These differences in viewpoint between the transformation model of development and the neoclassical model are of far more than academic interest. In several important respects the models pose the policy problem in a somewhat different light.

First, in comparison with the neoclassical view that puts almost total weight upon the investment rate and the allocation of investment as the key variables on which policy should operate, the structural transformation view assigns considerable weight to somehow increasing the pace and effectiveness of innovation and learning. The effectiveness of investment appears to be powerfully related to the extent to which new investment flows into promising nontraditional industries and on the speed with which these new enterprises learn to operate efficiently. It is, of course, possible that rapid growth of total factor productivity is a natural concomitant of a high investment rate, but Bruton's study suggests this is not so. His data also show that neither growth of output nor growth of employment is closely linked to the growth of capital.[2]

Sensible development policy thus must do more than simply getting up the investment rate. Countries apparently differ significantly in

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[1] I. Adelman and T. Sparrow, *Dynamic Linear Development Planning* (mimeo).

[2] H. Bruton, "Productivity Growth in Latin America."

the extent to which their environment is conducive to selective and effective innovation and learning. An important objective of policy must be to create a conducive environment.

Second, the structural transformation model implies a much reduced utility of existing industry input-output relationships, product and factor prices, and demand patterns as predictors of future composition of inputs, outputs, prices, or evolving comparative advantage. The structural transformation view implies that the cutting edge of expansion both is and should be firms with coefficients significantly different from the industry average. Within the group of modern expanding firms one would expect, and hope for, changes in input coefficients over time in response to growth of output, experience, improvement in supply conditions, and other factors. One would expect an uneven pace of innovation and learning among industries, with significant changes in relative product attractiveness (including both price and quality) as well as input coefficients. If the system of incentives is permissive, variation in growth rates may transcend variation permitted by domestic demand functions (which in themselves may have considerable sensitivity to price and quality) and the development of export markets.

In the context of an analysis attempting to shed some empirical light on the balanced versus unbalanced growth controversy, Swamy has examined the relative "balance" of expansion in high growth versus low growth countries.[1] His findings are that the faster the growth rate, the greater the discrepancy from a pattern of industry growth that would be predicted from either strict proportional growth or growth related to income elasticities of demand. Swamy's study suggests a macroeconomic analogue to the apparent differences in environments for innovation and learning mentioned earlier. The difference in environments appears strongly related to the ability to tolerate, or, better, make profitable, rapid opportunistic growth of an unbalanced kind. Sensible policy must be designed with an eye to permitting and encouraging opportunistic growth.

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[1] D. Swamy, "Statistical Evidence of Balanced and Unbalanced Growth," *Review of Economics and Statistics*, Vol. XLIX, No. 3, August 1967.

Ability to predict in detail the promising export industries is sorely limited. Neither with respect to variety nor with respect to variation over time within any category could Colombia's minor export performance over the past six years have been predicted. In the Adelman-Sparrow model mentioned earlier, Colombia's export potential industries were limited, on the basis of 1950's performance, to coffee, petroleum, and bananas. Thus the model simply missed the whole point.

There are enormous problems involved in sensibly implementing a policy that involves industry by industry or firm by firm evaluation of requests for "infant" industry production. The firms that it is desired to encourage almost certainly will have, and will be expected to have, input coefficients and costs significantly different from those of existing firms. Further, costs and input coefficients are expected to change over time with growing scale and experience. Both of these considerations make the kinds of predictions needed for effective implementation of the policy extremely difficult and uncertain.

Third, the structural transformation model presents a quite different view of the nature of the unemployment and income distribution problem of a developing country from the neoclassical model. The explicit recognition of a dual labor market within manufacturing, the modern sector paying much higher wage rates and rationing jobs, makes several phenomena easier to understand if not necessarily easier to deal with. It may explain why a slowdown in expansion of the modern sector (perhaps because of an import squeeze) results in less of an increase in the unemployment rate than might be expected. With jobs limited in the modern sector, people scramble to find jobs in the much less import intensive (and lower wage) craft sector. Thus the problem of lifting the average real wage rate is seen to turn on the expansion of employment in the modern sector relative to the craft sector, and the question of preventing overt unemployment is seen in part as a matter of the extent to which the craft sector can continue to operate as the modern sector expands.

These are phenomena and relationships quite different from (though perhaps complementary rather than competing with) those stressed in the

more conventional formulation. It is quite important that wage rates in the modern sector be viewed differently from wage rates in the craft sector. The effect of higher wage rates in the modern sector may not be so much a reduction in total employment as a reduction of the percent of employment. This may result in little or no increase in the average wage rate but in a greater gap between the two labor markets. Different ways of encouraging the growth of modern industry must be distinguished. In particular, expansion into markets already served by crafts may reduce employment -- a very different effect from, say, expansion of exports.

Thus there are important implications of the structural transformation view with respect to the way the policy problems are posed -- what kinds of policies are important, what kinds of policies are feasible to implement, what kinds of policies may backfire. However, the point of view raises as many questions as it answers. Good development policy encourages innovation and learning, provides an environment where the innovative industries and sectors (whatever they may turn out to be) can expand rapidly and opportunistically, and aims to encourage employment growth in modern industry without eroding residual employment opportunities in the traditional sector. But how does one go about doing these things?

In subsequent chapters we shall make some suggestions. But before proceeding it is important to consider some further relevant constraints and relationships associated with policy making itself.

Some Normative Implications of a Positive Analysis of Policy Making

Some Problems with Viewing Overall Economic Policy Making as an Optimization Process

In principle any policy choice problem can be posed in terms of three basic components: the objectives and some kind of a weighting scheme on these objectives that together define a welfare function; a set of instruments at the control of the government that can be used

in varying ways; and the set of constraints and relations that determine the outcome of any policy choice in terms of the value taken on by the various objectives. The problem of policy choice then can be viewed as picking the set and levels of instruments that maximize the welfare or objective function subject to the constraints.[1]

The preceding section was concerned with our overall view of the set of constraints and relations intrinsic to the development process. Only a rough sketch of objectives has been provided thus far and almost no explicit discussion of the range of available instruments. It would appear that the next step ought to be a more careful appraisal of objectives, and a rich description of available policy options. We do not think so. The variety of different objectives and different points of view regarding their relative desirability, the vastness of the number of instruments that can be used in different ways, and the complexity of the constraints on economic development and lack of solid quantitative knowledge regarding them combine, we think, to rule out posing detailed overall economic policy as an optimization problem.

Perhaps the most important reason for not viewing overall economic policy as an optimization problem is that the distinction between ends, means, and "the way the system operates" invariably breaks down in a political environment. For example, is price stability an end in itself (related, say, to income distribution) or is it desired because it is believed conducive to growth and balance of payments equilibrium? Is government regulation or spending to be viewed solely as a possible instrument for the achievement of an objective or as something that colors the whole tone of the economic system -- something to be desired or disliked in itself? Furthermore, differences of opinion regarding desirable outcomes are likely to be correlated with, rather than independent of, differences in views of the way in which the economy works. Groups likely to be put at a disadvantage by a policy that will benefit another group are likely to invoke arguments

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[1] For a good summary discussion of policy optimization model see B. Hickman, ed., *Quantitative Planning of Economic Policy*, Washington, D.C., The Brookings Institution, 1965, Chapter 1.

about effects on incentives or economic efficiency. Under these circumstances the results of alternative policies are in large part debated rather than calculated and policies are invented rather than selected. Differences in interests tend to be log-rolled to achieve a coalition capable of agreeing to some choice rather than objectively balanced in an explicit utility function.

It is for such reasons that Braybrooke and Lindblom and others have pointed out that overall policy does not get dealt with as a whole.[1] Rather, the policy arena tends to be divided, in an *ad hoc* and expeditious way, into a set of subareas with the attention of the higher level policy making apparatus sometimes focused on one small subset of these, sometimes on another. Policy is considered at a high level only when "problems" caused by existing policy become a matter of open dispute, or when another problem on the agenda calls for reconsideration of this policy. A premium is placed on getting rid of the requirement to focus on a particular area when others may be compelling attention. The resolution of the problem at the higher level, if it can be achieved at all, usually amounts to the chartering of an institution with a prescribed set of instruments under its control and a rough set of decision rules as criteria for dealing with the problem. Once the institution is chartered, responsibility for carrying out the policy is delegated, and detailed overview of the institution from a high level may be quite nominal.

As a result, economic policy of any country at any time must be described largely in terms of a collection of relatively separate and independent institutions concerned with the implementation of relatively separate and independent policies. The institutions (and policies) may be defined in terms of subsector (transportation or power), a class of activities (education) or a regulation and management function (the allocation of foreign exchange or credit). There is, in general,

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[1] D. Braybrooke and C. Lindblom, *A Strategy for Decision: Policy Evaluation as a Social Process*, Glencoe, Illinois, The Free Press, 1963.

only limited coordination between the separate institutions (and policies), and not much of an effective, articulated overview.

Once policy making is viewed this way, two kinds of resource constraints, not typically considered by the optimization model, are seen to be important. At the lower level there are the resources delegated to the institution for administration. At the higher level of policy making there are constraints on a number of issues that can be considered or reconsidered effectively at any time. The resource constraint provides a limit at any time to the range of policies that can be effectively administered. The issues constraint limits the degree of high level control over the separate institutions that make policy on a day by day operational basis.[1]

The set of institutions with their respective charters can be viewed, in a sense, as an approximately optimized resolution of the higher order global policy problems. However, it is highly unlikely that there will be any sensible policy model, with reasonable objectives and a rational view of the world, consistent with the congeries of institutions and their decision rules in effect at any time. The fragmentation of the policy problem reflects the real inability to solve the problem as a whole. Although it makes better sense to view a particular institution and its charter as an implicit solution to a major problem, here too there are difficulties. The generally unclear nature of the policy objective and loose nature of the institution's charter means that the institution has freedom for maneuver. It has limited resources and people in nominal control of these resources with their own interests and problems. These may well include both increasing power and wealth and reducing trouble and effort. The administration of policy is likely to be much more mechanical and routinized -- using a simpler decision rule over a smaller and less sophisticated domain of separate contingencies -- than a sophisticated analysis of optimal decision rules would imply.

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[1] A. Hirschman, *The Strategy of Economic Development*, New Haven, Yale University Press, 1958; and W. Stolper, *Planning Without Facts*, Cambridge, Massachusetts, Harvard University Press, 1961, both stress the importance of these kinds of constraints.

As the institutional environment policies become routinized, they develop a vested interest. If a policy continues over any considerable period of time, people and groups will have learned to accommodate themselves to it in the sense of finding ways to live with it, or take advantage of it, as best they can. The vesting effect on that segment of the public that has learned to accommodate to a policy complements the vested interest of the administrators that staff the institutions charged with policy implementation. As a result, the institutionalized policies may become quite insulated from the control of the elected officials at the center, and an effective coalition against change in a particular policy area may be formed.

Some Implications with Respect to Evaluation of Normative Economic Policy in Colombia

We think that there are three important implications of the preceding discussion for normative policy evaluation in Colombia. First, policy proposals should be made with full consideration of both the administrative limitations of the government and the limited competence of any government to consider a wide range of policy problems simultaneously. Second, policy choices should be made with the knowledge that today's decisions will significantly influence the ability to maneuver tomorrow and that frequent, abrupt changes in policy both increase the motivation to evade policy and decrease the government's competence to control evasion. Third, the political nature of economic policy making must be clearly recognized.

(1) The effects of government economic policies are pervasive on one hand but strictly limited in terms of the area where microeconomic control can be exerted on the other. Understanding of this paradox is crucial. Almost any major policy decision -- to devalue, to tighten money, to promote exports -- generates forces that sooner or later, directly or indirectly, affect people in almost all walks of life. But given the government's limited administrative resources, policies can be applied selectively and sensibly in only a few areas at any one time unless there is strong incentive to comply voluntarily.

A quasi-equilibrium system with the effective exchange rate approximating a free market rate needs little administration and monitoring to be effective. A system of import licensing and quantitative exchange controls will inevitably result in distortions that are partly random and partly systematic. In particular, such control systems tend to restrain the rate of change in the structure of production, a phenomenon that we view as essential to the growth process. A general tightening of money through higher reserve requirements is not hard to enforce; a selective tightening of credit in different fields is much more difficult.

Policies aimed at detailed control will not in general have stated objectives that are different from a more macroeconomic policy. But the effects will be different from those intended. Much evasion must be expected. More important, the administrative decision rules adopted will have to be crude. The import licensing criteria of the Superintendencia de Comercio Exterior are a case in point. Simple and stable decision rules are likely to be close to optimal only when contingencies can be predicted in advance. The essence of the development process is that they cannot.

This is not to argue that it is foolish to attempt any form of microeconomic control, only that microeconomic control is effective in very limited areas. Trying to exert it in too many areas at once is diabolically well designed to scotch the development process rather than further it. The very severe administrative (or decisionmaking) constraints make any attempt at systematic indicative planning quite unfeasible.

(2) The government must choose its mix of macroeconomic policies and selected microeconomic policies with awareness that what it does today will affect what it can and can't do tomorrow. Institutions once created are difficult to get rid of. Not only are the institutions and policies themselves hard to get rid of, their existence seriously constrains the room for maneuver in dealing with new problems and implies an added strain on the already severely taxed personnel resources of the government.

The problems created by abrupt shifts in policy are even more severe. The hyperinflation of 1963 that followed the government's decision to relax monetary controls in 1961-1962 created a set of price expectations that continues to dominate private liquidity preference and inflate the cost of financial intermediation. The abrupt shift away from a policy of import liberalization in late 1966 left many Colombian manufacturers with a strengthened resolve to take advantage of any subsequent trade liberalization by hoarding imports of intermediate goods. This will severely constrain the feasible pace of import liberalization in the future. Although the decrees of 1965 in the labor field did not cause a significant increase in the actual cost of labor, they resulted in a very large increase in the expected cost of labor since many firms decided that these changes were just the first of a series of cost-increasing amendments to the labor code.

(3) The nature of the high level political machinery that creates, modifies, and destroys policies and policy institutions is of pivotal importance. It is significant that Japan, Mexico, Taiwan, and Israel, all countries that have had relatively successful development experience, have been able to achieve a considerable degree of continuity in politics. In these countries, conscious policies were invoked and enforced over time to erode the resistance of powerful interest groups to new policies and to build a vested interest in the new policy departures. These countries were able to engage in successful long term economic planning but not in the neoclassical policy model sense. Rather the planning involved the ability to specify certain problem areas and policies regarding them that happened to be pivotal and fruitful in generating development and to push on with these steadily despite what, for a time, was strong opposition. We suspect that these high level judgments were rarely, if ever, the result of any careful optimization analysis. Rather they represented ability, or luck, in getting a coalition of sufficient power to persevere with the policies agreed upon, even though the short term results may not have been impressive.

The implications of all this for Colombia are simply this. We believe that a number of related sets of policies exist under which Colombia can make significantly more progress toward growth and employment objectives than she has over the past seven or eight years. We are less sure, however, that the political coalition needed to carry out such a general reform of economic policy can be established. The problem is not essentially one of broad objectives. Increasing income, reducing the volume of urban unemployment, and getting rid of dependence upon foreign organizations for needed foreign exchange certainly are elements of a winning political program. The difficulty is finding a set of specific policies that can attract and hold a winning coalition. To do so will be a work of political art. For this reason it is of critical importance that international assistance to Colombia not be tied to acceptance of a set of specific policy reforms that are somehow judged "optimal." There is a clear need to obtain agreement over the objectives of policy reform, but in most cases a number of possible combinations of specific policies will be more or less consistent with the operational definition of these objectives. It is thus of the utmost importance that bargaining over the terms of credit or assistance be carried out so as to preserve room for policy maneuver for the Colombian government.

Economic analysis, together with a reading of past history in several of the countries that have achieved workable development policies, does point rather clearly in certain broad directions. In Chapter III we shall sketch out several of the areas and policies that we think promising for Colombia. Whether Colombia has the political structure capable of adopting a set of policies that go in these directions effectively is beyond our scope, although that, rather than the identification of the policies, may be the key question.

III. TOWARD A MORE OPEN ECONOMY WITH A MORE REALISTIC EFFECTIVE EXCHANGE RATE

THIS CHAPTER will be concerned with macroeconomic policies -- policies that set the broad context within which individual decisionmaking proceeds. A considerable literature has evolved on the various and often conflicting goals of macroeconomic policy in the developed countries. We should like to propose that in an underdeveloped economy of the size and structure of Colombia almost all of the higher order objectives are furthered by a macroeconomic policy aimed at the achievement of a relatively open economy, with the exchange rate rather than quantitative controls or fiscal-monetary restraints on demand playing the dominant role in equilibrating demand for and supply of foreign exchange.

There are three sections to this chapter. The first section will consider the objectives of foreign exchange policy in Colombia. The second section will discuss possible changes in the instruments of foreign exchange policy. By the term "foreign exchange policy" we mean all government actions that affect the supply of or demand for foreign exchange through direct influence on the price or possibility of international transactions -- not just exchange rate policy. Although the level of analysis is at times relatively detailed, this section is, and is meant to be, a discussion of current policy issues and not an attempt at specific policy prescription. The third section discusses the relationship between exchange rate policy and the capabilities and appropriate use of fiscal-monetary instruments.

The Objectives of Foreign Exchange Policy in Colombia

Colombian foreign exchange policy in the past has mainly been a continuing exercise in crisis management. From the point of view of averting short run panic it has a record of both success and failure. From the point of view of contributing to a long run development policy it has been inadequate. A large part of this inadequacy has resulted specifically from the fact that this policy has in some sense been jointly determined by two groups -- the government of Colombia and the international lending and monetary agencies -- who have been unable to communicate with one another. Unless the quality of dialogue improves significantly, the likelihood is that the future will be a repetition of the past. The root of this failure in communication lies in a fundamental difference of opinion about the possibilities of "free" equilibrium in the foreign exchange market. With each new set of exchange regulations the international agencies announce their hope that an important first step has been taken toward achieving an equilibrium exchange system. We doubt that many important governmental or business groups in Colombia think in those terms. Some local decisionmakers simply do not accept the notion that market allocation of access to foreign resources is a worthwhile objective. Although the argument is probably less common now than it was five years ago, many Colombians continue to hold to the notion that "social" goals cannot be achieved without virtually complete administrative allocation of foreign exchange. We suspect that the majority viewpoint is the intellectually distinct (but bureaucratically cooperative) position that the foreign exchange disequilibrium is "structural" and that the prospects are very dim for economic change sufficient to narrow greatly the magnitude of the disequilibrium.

It is because neither the Colombians nor the international agencies really faced up to this difference of opinion that each past crisis bore a striking resemblance to the one preceding. The format

of the stabilization programs urged by the international experts carried the imprint of the goal of quick achievement of a free market equilibrium system. The Colombian authorities refused to accept the possibility of achieving this objective in the short run. From the short run point of view we suspect the Colombians were the more realistic. From the longer run point of view there is no question but that the degree of administrative control over the foreign exchange market must abate if Colombia is to achieve a higher rate of growth of output.

Since the commitment of the government of Colombia to the disequilibrium system is more pragmatic than doctrinal it is not inevitable that the current policy impasse should persist. The first requirement for an improvement in the quality of communication between the international agencies and the Colombian government is the recognition by the former that the transition from a disequilibrium system to an equilibrium system is more difficult than is implied by a "devalue, unify, liberalize, control the money supply" policy package. The problem is "structural" in the sense that the adjustment to an equilibrium system involves fundamental changes in expectations and in the structure of production and therefore takes time. After ten years of disequilibrium it is not possible to reestablish the basis for something like the equilibrium system with one quick change in international relative prices. The second requirement is that Colombian policy makers believe that in the long run at least the excess demand for foreign exchange is fairly sensitive to the exchange rate. In particular, it is important that the government be convinced of the price sensitivity of nontraditional exports and the critical importance of the minor export program. It would be well if the international agencies were also more aware of the closeness of the relationship between the possibility of relaxing the rigidity of the disequilibrium system of foreign exchange policy and the degree of success in making minor exports into major exports. A final prerequisite for an improved climate of policy making is the recognition that further increases in the effective exchange rate are needed to compensate for the shift in the supply of foreign exchange that

resulted from the fall in coffee prices in 1956-1958 and the subsequent import substitution experience. There should be no illusions that something like an equilibrium system can be established if the real exchange rate is simply maintained at the level of 1958-1959.

The government of Colombia would certainly be taking a substantial political risk in accepting these minimal prerequisites to further productive dialogue with the international agencies. The Colombian decisionmakers therefore must understand and believe in the ultimate advantages to be derived from a more open economy and a quasi-equilibrium exchange rate system. We suspect that most of these arguments are already understood and accepted by most of the responsible political leaders so long as the analysis is posed in terms of the medium to long run.

The classical argument in favor of an open economy has been in terms of the advantages to be derived from exploitation of comparative advantage. Partly because of the inability of economists to designate areas of comparative advantage and disadvantage and partly because of the belief that, for almost any factor prices and in almost any industry, efficiently operated modern technology is more productive than craft production, it seemed sensible to many countries during the 1950s to encourage manufacturing development by providing a protected domestic market for all comers. As the experience of Colombia and other countries that have gone this route now shows clearly, "efficiently operated" is a key qualification. There is now increasing awareness of the relationship between efficiency and scale of production and of the need to develop export markets if the problem of excess capacity is to be dealt with.[1]

Closely associated with, but distinguishable from, the renewed awareness of the importance of comparative advantage is the growing

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[1] The changes in attitudes among the "tecnicos" within (or potentially within) the government reflect many of the considerations that prompted Prebisch to revise his ideas about development policy. See R. Prebisch, *Towards a Dynamic Development Policy for Latin America*, New York, United Nations, 1963, for a provocative (and influential) discussion of the role of import substitution.

realization that a closed economy presents a very serious problem of public control of industry in a small country. Those countries that have gone the protectionist route with little emphasis on exports have increasingly found themselves faced with a dilemma. On the one hand, they have eroded the ability of the price system to generate incentives and pressures that will spur efficiency and regulate product and factor prices such that the prices of factors in different uses are similar and relative prices are roughly consonant with relative marginal costs. On the other hand, they have gained a much keener awareness of how difficult and costly it is to attempt to use a sensible, detailed regulatory policy from the center. In the past there has been a strongly optimistic tradition within the Colombian government concerning the difficulties of administrative allocation -- so much so that necessity has become a virtue in the eyes of many. This tradition is by no means dead, but an increasing number of the younger planners and administrators understand the empty, *pro forma* nature of many of the direct control procedures. It would therefore seem that even if there were no facts of life with respect to comparative advantage to consider, awareness of the problems of public control of industry in a small, protected economy would call for the use of imports or the possibility of imports as a control device.

A further reason for moving toward a more export oriented economy and a quasi-equilibrium exchange rate system is to enhance the employment generating capabilities of the manufacturing sector. Those economies oriented toward import substitution that have in recent years managed to maintain a respectable growth of manufacturing output -- Brazil, India, Egypt, and Colombia -- have experienced extremely slow growth of manufacturing employment in comparison with export oriented economies such as Taiwan and Israel. Although this phenomenon has only recently been noticed and is far from being understood, it appears almost inherent in protection and inward looking development. In the first place, barring anomalies originating in bilateral trade agreements, the export capabilities of manufacturing will be largely confined to industries that can fruitfully employ large

quantities of relatively inexperienced and poorly educated labor. Scotching the incentives for expansion of export oriented industries, therefore, almost automatically shifts the mix of industrial development away from those industries that generate the most demand for labor.. Second, a protectionist policy reduces competitive pressures on costs, creates an environment within which labor employed in modern manufacturing can force up wages relatively easily, and reduces the price of imported capital equipment. The result is a reduction of the incentive to find ways to adapt an imported technology to Colombia's labor-rich resource endowment. Third, by focusing the modern sector on domestic markets rather than on exports, firms using much less labor per unit of output than traditional craft firms are led to substitute for traditional industry as well as imports.

Finally, a more realistic exchange rate policy would significantly increase the power of fiscal and monetary policy to achieve growth objectives and enable the Colombian government to maintain greater freedom of action with respect to decisions in this policy field. This point will be taken up in the last section of this chapter.

Changes in the Instruments of Foreign Exchange Policy

We think there are many reasons for being optimistic about the willingness and the ability of the Colombian government to rethink its foreign exchange strategy. The authorization of tariff reform given by the Special Powers Act of 1968 is one reason. Another reason is the government's decision in 1967 to substitute the certificate system for the system of fixed exchange rates. Although it is quite true that the system provides no automatic guarantees that the nominal and shadow prices of foreign exchange will converge, it does provide a mechanism that is infinitely more likely to be consistent with the notion of maintaining an equilibrium exchange system in Colombia than a fixed rate policy. The question of how to utilize these opportunities remains. In this respect three issues seem paramount. (1) What

should be the policy with respect to the rate of increase of the average level of the exchange rate structure? (2) Should the exchange rate be unified? (3) Should import licensing procedures be liberalized? These questions will be taken up in the following sections.

Changes in the Level of the Exchange Rate

Except in the simple world of models, there is no such thing as "the effective exchange rate." In general there is a wide variety of rates on different kinds of transactions -- different terms on which one can gain access to foreign goods and services or receive domestic currency for goods or services rendered to foreigners. Often there is a multiplicity of nominal exchange rates. Until recently Colombia had a multiple fixed exchange rate system. Superimposed upon the nominal rate structure is a structure of taxes, subsidies, rebates, and tariffs which differ among different kinds of transactions. Intertwined with these is a set of nonprice factors -- prohibitions, licenses, advanced deposit requirements -- which also influence the terms of different transactions in different ways. In the following sections we shall be concerned with this structure. Yet conceptually, at least, one can think of moving the entire structure up or down. In this sense there is an "average" exchange rate. In Colombia the pivot of the exchange rate system is the certificate rate, and in the following discussion we shall use this rate of exchange as a proxy for the "average" level of the complete exchange rate structure.

The key element in the needed reform of foreign exchange policy in Colombia is an increase in the real certificate rate of exchange. The current certificate rate is certainly lower than an equilibrium rate.[1] How much lower is not known, but it is virtually certain that the disequilibrium gap is too large to close in one quick round of devaluation and decontrol. If Colombia is to improve her growth and

[1] We do not mean to imply the existence of an *optimal* rate of exchange. Among other things, the exchange rate consistent with equilibrium in the foreign exchange market is a function of the desired rate of growth of output.

employment record it is essential that the rigidity of import licensing and exchange control over capital flows be relaxed sufficiently to allow the certificate rate to increase more rapidly than the general level of domestic prices. It is also essential that this depreciation of the international value of the peso proceed gradually rather than abruptly. Although the purchasing-power parity theory of exchange rates is approximative at best, we feel that the relative rates of growth of domestic and international prices are likely to be sufficiently different that the real exchange rate defined by the ratio of domestic and international price indexes excluding foodstuffs will serve as a useful benchmark for policy guidance during the period of transition from the disequilibrium system.[1] The certificate rate must increase with domestic prices simply to retain past levels of the real exchange rate. If devaluation in real terms is to be achieved, the certificate rate must increase even more rapidly than the domestic price level. It would be presumptuous to attempt to specify how much the certificate rate should increase in excess of this benchmark, but it does seem reasonable to suppose that the Colombian government should attempt to achieve something like free equilibrium in the certificate market within a five year period.

Although there is general agreement that the peso is overvalued, there is some controversy over the best means of devaluation. We believe that the mechanism of the certificate system (or a close relative) offers much the best chance of converging the nominal and shadow prices of foreign exchange with minimum political repercussions. Given the political climate of Colombia, a return to the fixed rate system would be a major step backward even if this were accompanied by a substantial devaluation of the import rate. If there is anyone still afflicted with a yearning for a return to a fixed rate system he would do well to consider the fragility of government control over the

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[1] This begs the question of what price index should be used to deflate the nominal rate. There is no best answer here, but we suggest as a first approximation the ratio of the Colombian wholesale price index (without foodstuffs) to the price index of Colombian imports.

monetary system and the price expectations of the Colombian public. The domestic price level can be expected to rise more rapidly than most international prices and to rise at an uneven rate. In such circumstances a fixed rate system would imply extreme uncertainty in the real effective exchange rate and periods of substantial overvaluation of the peso.

The extent of the instability of the average real effective exchange rate in recent years can be seen through examination of Tables 2, 3, and 4. Table 2 gives the history of nominal exchange rates. Table 3 documents the concurrent history of effective rates.[1] By "effective" rate we mean the nominal rate adjusted for taxes and subsidies. Effective rates adjusted for international differences in the rate of change of prices -- real effective exchange rates -- are given in Table 4. Over the past ten years real effective exchange rates in Colombia have varied substantially. Continued uncertainty with respect to the real effective exchange rate would discourage both the development of export markets and the net inflow of foreign capital to Colombia. The periodic overvaluation of the peso would breed cycles

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[1] The relationship between nominal and effective rates differs by type of transaction. For example, the estimates of the effective exchange rate paid exporters of manufactured goods take account of the estimated value of tax rebates or dated tax certificates and the costs of export taxes, if any. It does not include an adjustment for possible import rebates under Plan Vallejo. The coffee rate is that reported by the International Monetary Fund. It includes adjustments for export taxes, taxes on exchange certificate turnover, and differences between the surrender (*reintegro*) price per unit exported and the New York price. The effective rate on imports includes exchange certificate taxes, the so-called "remittance" taxes, consular fees, and estimates of the average tariff rate and the average opportunity cost of funds frozen in import deposits. The figures given as the selling rate to importers are based on the average cost of tariffs and import deposits for all nonexempt imports. Since there is considerable dispersion in these costs between classes of imports, the actual effective exchange rate may be considerably lower or higher than the rate given in Table 3 depending upon what sort of good is being imported. The effective rate paid on import of capital equipment is about 5 percent less than that for all imports. The rate paid on nonprohibited consumer goods is about 5 percent higher. The effective rate of exchange for individual items, such as automobiles for private use, may be two or three times the average rate.

Table 2

NOMINAL EXCHANGE RATES, 1951-1967

(Colombian pesos per U.S. dollar at end of period)

Year	Quarter	Principal Selling Rate (before tax)	Principal Buying Rate (before tax)	Buying Rate for Proceeds of Manufactured Exports (before tax)	Free Rate or Capital Rate
1951	1	2.51	2.50	2.50	2.50
	2	2.51	2.50	2.50	2.50
	3	2.51	2.50	2.50	2.50
	4	2.51	2.50	2.50	2.50
1952	1	2.51	2.50	2.50	2.50
	2	2.51	2.50	2.50	2.50
	3	2.51	2.50	2.50	2.50
	4	2.51	2.50	2.50	2.50
1953	1	2.51	2.50	2.50	2.50
	2	2.51	2.50	2.50	2.50
	3	2.51	2.50	2.50	2.50
	4	2.51	2.50	2.50	2.50
1954	1	2.51	2.50	2.50	2.50
	2	2.51	2.50	2.50	2.50
	3	2.51	2.50	2.50	2.50
	4	2.51	2.50	2.50	2.50
1955	1	2.51	2.50	2.50	2.50
	2	2.51	2.50	4.01	4.01
	3	2.51	2.50	3.87	3.87
	4	2.51	2.50	4.16	4.16
1956	1	2.51	2.50	4.38	4.38
	2	2.51	2.50	4.66	4.66
	3	2.51	2.50	4.51	4.51
	4	2.51	2.50	6.86	6.86
1957	1	2.51	2.50	6.42	6.42
	2	5.96	5.96	5.96	5.96
	3	5.94	5.94	5.94	5.94
	4	6.22	6.22	6.22	6.22
1958	1	6.11	6.10	6.10	7.24
	2	6.81	6.10	6.10	7.84
	3	6.43	6.10	6.10	7.74
	4	6.40	6.10	6.10	8.23
1959	1	6.40	6.10	8.03	8.03
	2	6.40	6.10	7.98	7.98
	3	6.40	6.10	6.75	6.75
	4	6.40	6.10	7.01	7.01

Table 2, continued.

Year	Quarter	Principal Selling Rate (before tax)	Principal Buying Rate (before tax)	Buying Rate for Proceeds of Manufactured Exports (before tax)	Free Rate or Capital Rate
1960	1	6.64	6.10	6.75	6.75
	2	6.70	6.50	6.82	6.82
	3	6.70	6.50	7.00	7.00
	4	6.70	6.50	7.23	7.23
1961	1	6.70	6.50	8.00	8.00
	2	6.70	6.50	8.36	8.36
	3	6.70	6.50	8.71	8.71
	4	6.70	6.50	8.82	8.82
1962	1	6.70	6.50	8.85	8.85
	2	6.70	6.50	8.74	8.74
	3	6.70	6.50	8.90	8.90
	4	9.00	9.00	11.09	11.09
1963	1	9.00	9.00	9.99	9.99
	2	9.00	9.00	9.99	9.99
	3	9.00	9.00	9.99	9.99
	4	9.00	9.00	9.99	9.99
1964	1	9.00	9.00	10.04	10.04
	2	9.00	9.00	9.99	9.99
	3	9.00	9.00	9.98	9.98
	4	9.00	9.00	12.82	12.82
1965	1	9.00	9.00	14.02	14.02
	2	9.00	9.00	19.82	19.82
	3	9.00/13.50	13.50	13.50	18.20
	4	9.00/13.50	13.50	13.50	18.29
1966	1	9.00/13.50	13.50	13.50	17.87
	2	9.00/13.50	13.50	13.50	16.14
	3	9.00/13.50	13.50	13.50	16.35
	4	9.00/13.50	13.50	13.50	16.30
1967	1	13.51	13.51	13.51	16.30
	2	14.48	14.48	14.48	16.30
	3	15.30	15.30	15.30	16.30
	4	15.76	15.76	15.76	16.30
1968	1	15.98	15.98	15.98	16.30

Source:
International Monetary Fund, *International Financial Statistics.*

Table 3

EFFECTIVE EXCHANGE RATES, 1951-1967

(Colombian pesos per U.S. dollar)

Year	Quarter	Selling Rate to Importers (average for period)	Buying Rate for Coffee Exporters (end of period only)	Buying Rate for Exporters of Manufactured Goods (average for period)
1951	1	2.90	2.09	2.50
	2	2.90	2.09	2.50
	3	2.90	2.09	2.50
	4	2.90	2.19	2.50
1952	1	3.16	2.21	2.50
	2	3.16	2.24	2.50
	3	3.16	2.26	2.50
	4	3.16	2.29	2.50
1953	1	3.11	2.31	2.50
	2	3.11	2.34	2.50
	3	3.11	2.36	2.50
	4	3.11	2.38	2.50
1954	1	3.10	2.38	2.50
	2	3.10	2.38	2.50
	3	3.10	2.38	2.50
	4	3.10	2.38	2.50
1955	1	3.08	2.50	2.50
	2	3.08	2.50	3.00
	3	3.08	2.67	3.94
	4	3.08	2.50	4.01
1956	1	3.04	2.68	4.27
	2	3.04	2.86	4.52
	3	3.04	2.93	4.59
	4	3.04	3.18	6.42
1957	1	3.13	3.15	6.42
	2	3.20	4.11	6.19
	3	5.88	4.10	4.20
	4	6.29	4.28	4.80
1958	1	6.92	4.72	5.92
	2	8.37	5.00	5.98
	3	8.29	5.02	5.98
	4	8.05	4.84	5.98
1959	1	8.54	4.81	8.03
	2	8.28	4.74	7.82
	3	7.73	5.11	7.36
	4	7.73	5.03	7.09

Table 3, continued.

Year	Quarter	Selling Rate to Importers (average for period)	Buying Rate for Coffee Exporters (end of period only)	Buying Rate for Exporters of Manufactured Goods (average for period)
1960	1	8.12	5.10	6.65
	2	8.36	5.43	6.66
	3	8.42	5.44	6.79
	4	8.42	5.38	6.99
1961	1	8.34	5.80	7.50
	2	8.34	5.76	9.18
	3	8.34	5.76	9.61
	4	8.34	5.72	9.81
1962	1	8.37	6.30	9.78
	2	8.37	6.35	9.77
	3	8.37	6.41	9.74
	4	8.97	6.96	11.31
1963	1	11.01	7.05	11.30
	2	11.01	7.01	11.19
	3	11.01	7.02	11.19
	4	11.01	7.01	11.19
1964	1	11.03	7.30	11.19
	2	11.03	7.30	11.18
	3	11.03	7.30	11.18
	4	11.03	7.30	13.15
1965	1	11.67	7.67	15.53
	2	11.67	7.67	16.59
	3	11.96	8.50	16.40
	4	14.88	8.50	15.12
1966	1	16.82	8.94	15.12
	2	17.08	8.94	15.12
	3	17.53	9.35	15.12
	4	17.91	9.94	15.12
1967	1	17.02	10.00	15.95
	2	17.38	10.99	15.95
	3	18.04	11.67	17.04
	4	18.76	12.13	17.33

Source:
Derived from Table 2 and information provided by the Departamento Administrativo de Planeacion of the Colombian government.

Table 4

THE AVERAGE REAL EFFECTIVE EXCHANGE RATES FOR IMPORTS AND MINOR EXPORTS

Year	Quarter	Index of Wholesale Prices (1958=100)	Index of Real Effective Import Rate[a] (1958=100)	Index of Cost of Production[b] (1958=100)	Index of Real Effective Minor Export Rate[c] (1958=100)
1958	1	92	95	92	108
	2	96	110	96	104
	3	101	103	101	99
	4	103	99	103	97
1959	1	104	105	104	129
	2	106	99	106	124
	3	110	90	110	113
	4	110	90	110	109
1960	1	110	94	110	100
	2	112	96	112	99
	3	113	95	113	100
	4	114	94	114	101
1961	1	116	91	116	106
	2	117	90	117	128
	3	118	90	118	133
	4	119	89	119	135
1962	1	120	89	120	133
	2	122	88	122	130
	3	124	86	124	127
	4	126	91	126	145
1963	1	143	98	143	125
	2	154	91	154	116
	3	157	89	157	114
	4	160	88	160	112
1964	1	163	86	163	110
	2	166	85	166	108
	3	169	84	169	106
	4	171	82	171	123
1965	1	174	86	174	143
	2	179	83	179	149
	3	188	81	188	140
	4	199	95	199	121

Table 4, continued.

Year	Quarter	Index of Wholesale Prices (1958=100)	Index of Real Effective Import Rate[a] (1958=100)	Index of Cost of Production[b] (1958=100)	Index of Real Effective Minor Export Rate[c] (1958=100)
1966	1	210	102	210	115
	2	217	101	217	111
	3	224	100	224	107
	4	230	99	230	105
1967	1	233	93	233	103
	2	238	93	238	107
	3	243	95	243	112
	4	245	98	245	109

Notes:

[a]The average effective exchange rate is defined as the nominal rate adjusted for exchange certificate taxes, consular fees, the so-called "remittance" taxes, and estimates of the average tariff rate and the opportunity cost of funds frozen in deposit requirements. The real effective rate is the effective rate deflated by the Colombian wholesale price index (excluding foodstuffs). The latter adjustment ignores the effects of changes in the foreign export price of Colombian imports, but since IMF data do not give evidence of a trend in c.i.f. import prices for Colombia, this complication can be ignored for most purposes.

[b]This index is an index of the cost of manufactured exports. It is a composite of separate indexes of the cost of labor (average hourly wage of workers in manufacturing as reported to DANE, the National Statistical Office), the cost of imported intermediate goods (the effective exchange rate on imports), and the cost of domestically produced intermediate goods (the wholesale price index excluding foodstuffs). The respective weights are 13.5 percent, 13.5 percent, and 73 percent and were developed by A. Urdinola and R. Mallon in *Policies to Promote Colombian Exports of Manufactures*, Economic Development Report Number 75, Development Advisory Service, Harvard University.

[c]The effective rate on minor exports is defined as the nominal rate adjusted for export taxes and tax rebates. The real effective rate is the effective rate deflated by the cost of production in manufacturing.

Sources:

Price data were taken from the *Revista del Banco de la Republica*. Data on nominal exchange rates are those given by the International Monetary Fund; *International Financial Statistics*. The adjustments from nominal to effective exchange rates are based on information collected by the Departamento Administrativo de Planeacion of the Government of Colombia.

of switching from domestic to foreign sources of supply, encourage excess capital intensity of production, and exacerbate the government's budgetary problem by causing cyclical variations in tariff collections.[1]

The proximate purpose of this gradual real devaluation is to relax the foreign exchange constraint that binds Colombia's growth and employment possibilities by stimulating exports, encouraging the rational substitution of domestic products for imported intermediate goods, stimulating the flow of foreign capital, and creating a set of expectations with respect to the real value of the peso that will discourage periodic switching from peso to dollar assets. These benefits are achieved at the expense of costs in the form of a somewhat quickened pace of domestic inflation and an increase in the domestic resource cost of a unit of imports. The following sections will discuss certain of the quantitative dimensions of the change in excess demand for foreign exchange and the change in domestic prices that are implied by devaluation.

The Relationship Between Exports and the Exchange Rate. The great bulk of Colombian exports remains in the form of coffee. Since both the volume and dollar price of coffee exports are essentially independent of Colombian foreign exchange policy, the issue to be explored here is the price responsiveness of the so-called minor exports -- exports other than coffee or petroleum. Fortunately, there is some evidence as to this. For the period 1960-1967 the short run elasticity of agricultural exports other than coffee in dollar terms with respect to the real exchange rate appears to be about 1.0. The short run elasticity of nonagricultural exports in dollar terms can be estimated as about 0.8.[2] By that we mean that a 10 percent

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[1] An excellent discussion of the problem of fixed rates in the Colombian context is given by H. Dunkerley in *Exchange Rate Systems and Development in Conditions of Continuing Inflation*, Report No. 37, Development Advisory Service, Harvard University.

[2] These estimates were obtained from the regression equation

$$\log Y_t = a + b_1 \log X_{1_t} + b_2 \log X_{2_t} + b_3 W_{1_t} + b_4 W_{2_t} + b_5 W_{3_t} + u_t ,$$

increase in the real effective exchange rate for minor exports has recently been associated with a 10 percent increase in the dollar volume of agricultural exports and an 8 percent increase in the dollar volume of nonagricultural exports (other than fuel oil) within a period of no more than three months from the date of the price change. This hardly

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where Y is the volume of exports, X_1 is the real effective exchange rate, X_2 is the volume of total world exports, and W_1, W_2, and W_3 are dummy variables introduced to capture quarterly variation over the first three quarters of the calendar year. The data are quarterly observations, t being the appropriate time subscript. This regression model is the most successful of those developed by John Sheahan in *The Response of Colombian Exports to Variations in Effective Exchange Rates*, Research Memorandum No. 11, Center for Development Economics, Williams College (memeographed). The elasticity estimates obtained by Urdinola and Mallon have the virtue of being based on a better measure of effective exchange rates than that used by Sheahan, but their data are yearly observations. Sheahan has shown conclusively the necessity of using quarterly data.

The regression equations that we have obtained on 1960-1967 quarterly data (with standard errors of regression coefficients indicated in parentheses) are as follows:

(1) Y = agricultural exports other than coffee,

$$\log Y_t = \underset{}{-5.04} + \underset{(.46)}{1.06} \log X_{1t} + \underset{(.31)}{.871} \log X_{2t} + \underset{(.16)}{.30} W_{1t} + \underset{(.16)}{.46} W_{2t} + \underset{(.16)}{.26} W_{3t},$$

$$\bar{R}^2 = .45, \text{ F-value} = 4.07 ;$$

(2) Y = nonagricultural exports other than petroleum and fuel oil,

$$\log Y_t = \underset{}{-13.28} + \underset{(.28)}{.77} \log X_{1t} + \underset{(.19)}{2.79} \log X_{2t} + \underset{(.10)}{.03} W_{1t} + \underset{(.10)}{.02} W_{2t} + \underset{(.10)}{.15} W_{3t}$$

$$R^2 = .90, \text{ F-value} = 44.12 ;$$

(3) Y = all minor exports (including fuel oil),

$$\log Y_t = \underset{}{-6.14} + \underset{(.26)}{.72} \log X_{1t} + \underset{(.17)}{1.57} \log X_{2t} + \underset{(.09)}{.12} W_{1t} + \underset{(.09)}{.20} W_{2t} + \underset{(.09)}{.17} W_{3t}$$

$$R^2 = .79, \text{ F-value} = 18.40.$$

Note that the elasticity of response of all minor exports (the elasticity corresponding to Sheahan's estimates) is less than that for either agricultural minor exports or nonagricultural exports other than petroleum and fuel oil. The difference is explained by the inclusion of fuel oil exports in the data for all minor exports. Given the special exchange circumstances surrounding the export of petroleum products by foreign firms, it is not surprising that fuel oil exports should prove to be unrelated to variations in the effective exchange rate for minor exports.

supports the argument that Colombian exports are not very price responsive.

The above estimates leave open the question of what the longer run response might be. During the 1960-1967 period for which the estimates were obtained, changes in the effective exchange rate were followed so closely by increases in the domestic cost index that supply response to devaluation was largely limited to the quarter in which the devaluation took place. In the period 1953-1959, export supply response to devaluation was typically spread over a long period of time since the erosion of the real effective exchange rate through domestic price increases was less rapid. For that period the elasticity of response of all minor (chiefly agricultural) exports measured over a period of not more than six months following a change in the effective exchange rate is in the order of 1.6.[1] The corresponding three-month response is 1.2.

The empirical evidence is thus in accord with the common sense conclusion that the long run price response is substantially greater than the short run response. Because of the extreme instability of the real effective rate of exchange for minor exports it is not possible to resolve this question any further through empirical analysis. The difference between the estimated elasticities of nonagricultural

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[1] The regression equations on 1953-1959 quarterly data for total minor exports are:

$$\log Y_t = .17 + \underset{(.20)}{1.24}\ \log X_{1t} - \underset{(.35)}{.32}\ \log X_{2t} + \underset{(.09)^1t}{.09W_1} + \underset{(.09)^2t}{.12W_2} - \underset{(.09)^3t}{.01W_3}, \text{ and}$$

$$\log Y_t = 0.28 + \underset{(.31)}{.98}\ \log X_{1t} + \underset{(.33)}{.64}\ \log X_{1t-1} - \underset{(.49)}{.60}\ \log X_{2t} + \underset{(.12)^1t}{.07W_1} + \underset{(.12)^2t}{.17W_2} - \underset{(.12)^3t}{.08W_3}.$$

Where total minor exports are regressed on both current and lagged values of the real effective exchange rate for the period 1960-1967, the equation is:

$$\log Y_t = -6.07 + \underset{(.45)}{.80}\ \log X_{1t} - \underset{(.45)}{.10}\ \log X_{1t-1} + \underset{(.18)}{1.58}\ \log X_{2t} + \underset{(.09)^1t}{.12W_1} + \underset{(.09)^2t}{.20W_2} + \underset{(.09)^3t}{.18W_3}.$$

and agricultural goods probably reflects differences in the marketing structure and differences in the foreign elasticity of demand for the two classes of commodities. When the price differential is expected to decrease rapidly, the volume of goods that will be exported will be strongly sensitive to whether a marketing structure already exists for the sale of the good in question. The number of agricultural exports is fairly small, and the marketing procedures for each commodity have already been routinized. This is not the case for most manufactured exports. Manufactured exports are also clearly more likely to be products that are differentiated from their close substitutes in terms of quality, design, and so on, and thus likely to be faced with a considerably less elastic foreign demand. Yet the same factors that lead one to the conclusion that the short run elasticity of response for manufactured goods should be less than for agricultural products also lead one to the conclusion, other things being equal, that the difference between long run and short run response is likely to be greater for manufactured exports than for agricultural commodities.

With this evidence in mind -- and considering that there can be no doubt that a major expansion of minor exports is needed if Colombia is to achieve the growth targets embodied in the Alliance for Progress goals -- it is hard not to conclude that Colombia ought to increase the certificate rate of change, hence the effective rate of exchange on minor exports.[1] The real effective rate of exchange on minor exports today is at its lowest level since 1960 and considerably lower than it was in the years preceding the coffee crisis of 1957-1958.

The Demand for Imports and the Exchange Rate. We have no basis for estimating the quantitative relationship between the demand for

[1]The focus of the discussion here is on the price responsiveness of exports rather than those activities lumped under the term "export promotion." We do not mean to imply that such promotional programs are unimportant, for there is evidence to the contrary in the experience of Taiwan and Korea. The omission of any consideration of the activities of the Export Fund that was established in 1967 is dictated by our lack of knowledge as to its activities rather than any judgment of its importance.

imports and the exchange rate. There is little doubt that devaluation would reduce the quantity of imported intermediate goods demanded per unit of domestic output, but the magnitude of this shift is not known. Many Colombians are skeptical as to the ability of Colombian suppliers to respond to a price stimulus (or the willingness of demanders to respond to it). Nevertheless, the record of the last ten years suggests a fairly continuous decrease in the dependence of Colombian manufacturing on imported intermediate products. Evidence of this is presented in Table 5.[1] The biggest change in this ratio took place in 1956-1958 when the real effective exchange rate increased some 64 percent. The shadow rate of exchange rose even further, however, since quantitative restrictions on imports were utilized widely during those years. Since then the dependence of Colombian manufacturing on imported inputs has continued to fall. This trend has resulted from the stimulus of tariff protection, import prohibition, and the rationing of import licenses. Each of these factors has its price equivalent in terms of devaluation of the certificate rate. We cannot specify an exact value for the elasticity of supply of substitutes for imported inputs, but it can be estimated as significantly different from zero. Devaluation would thus result in further substitution of domestic production for imports of intermediate goods. However, it would also ultimately lead to a faster rate of growth of manufacturing output and hence to an increased total demand for intermediate goods. It does not appear possible to predict whether the reduction in imports resulting from increased import substitution will exceed the increase in imports resulting from a higher level of production and hence whether devaluation would result in a net decrease in the demand for imported intermediate goods.

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[1]The time series presented in Table 5 is a synthetic series in that the numerator of the ratio of imported inputs to value added in manufacturing is not the actual amount of intermediate goods imported in that year but rather a weighted average of the imports for that year and the two adjacent years. The weights are 25, 50, and 25, chronologically. This smoothing process was introduced to take account of inventory adjustments.

Table 5

CHANGES IN THE RATIO OF IMPORTED INTERMEDIATE GOODS TO VALUE ADDED IN MANUFACTURING, 1951-1966[a]

Year	Imported Intermediate Goods as a Proportion of Value Added (1953=100)
1951	96
1952	94
1953	100
1954	106
1955	107
1956	102
1957	90
1958	77
1959	70
1960	72
1961	71
1962	69
1963	66
1964	60
1965	59
1966	58

Note:

[a]For purposes of this table the value of imported goods actually utilized during a given calendar year has been estimated as a weighted average of the imports of such commodities during that year and the two adjacent years. The weights are 25 for (t-1), 50 for (t), and 25 for (t+1).

Source:

Value added in manufacturing. DANE, *Boletin Mensual.*

Imported intermediate goods (including fuels and construction materials). 1950-1964, J. Sheahan, *Imports, Investment and Growth: Colombian Experience Since 1950,* Research Memorandum No. 4, Center for Development Economics, Williams College; 1965-1967, estimates prepared from unpublished material from DANE.

The effect of devaluation on the quantity of imported capital goods demanded is even more difficult to evaluate. The substitution of domestic production for imports in response to devaluation is likely to be much less important in the case of capital goods than for intermediate goods, but the effect of devaluation on the total demand for capital goods could be quantitatively very significant. To the extent that the devaluation is part of an overall reform package that engenders increased business optimism and the expectation of an increased and more regular access to imports in the future, there will be a substantial increase in gross domestic investment. In this connection it is important to note that the level of capital goods import in recent years has been less than the level of the mid 1950s even though value added in manufacturing has doubled in the interim. Average before tax profit rates by industry appear to run in the range of 30-40 percent; and although there is no necessary relationship between average and marginal profit rates, we suspect that the effective block to a higher investment rate today is the constraint on import availability (of both capital and intermediate goods) and the lack of adequate export incentives.[1]

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[1]By "profit rate" we mean the ratio of value added less total labor costs and depreciation to the sum of fixed capital (valued in terms of replacement cost), inventories, and that part of working capital not financed by accounts payable. If there is no long term fixed debt this will be the rate of return on equity. DANE data have been used for estimates of value added, labor cost, and investment in plant, equipment, and inventories. The estimates for the fixed capital stock were obtained by cumulating DANE figures for gross investment on a revised version of the CEPAL (the UN's Economic Commission for Latin America) estimate of the value of the fixed capital stock in manufacturing in 1953. The revision in this case consisted of reducing the CEPAL estimate by 33 percent. All data are expressed in terms of 1964 investment good prices. If depreciation is assumed to be 5 percent of the annual capital stock, the average before tax profit rate in manufacturing appears to have been slightly in excess of 30 percent in 1964. The marginal capital-output ratio implied by these assumptions is only 0.8. Without revision of the CEPAL estimate and with the assumption of an 8 percent depreciation rate, the marginal capital-output ratio over the period 1953-1964 implied by the DANE data for manufacturing is actually negative. The implication is rather strong that the official data understate investment (and profits). This is also the consensus of the accounting profession in

Devaluation and Domestic Inflation. The major political resistance to devaluation stems not only from pessimism with respect to the price elasticity of the excess demand for foreign exchange but also from the fear that devaluation leads to increased inflation. In the qualitative sense such opposition is well founded. Devaluation will result in domestic price increases; whether it results in inflation in the sense of a substantial quickening in the rate of price increase is another matter, however. Our conclusion is that *gradual* devaluation would probably not result in price increases that are significantly larger than those needed to cover the increases in the cost of the total (direct and indirect) import content of production, and that these price increases can be accepted easily in a monetary environment in which the "normal" yearly rate of inflation is between 7 and 12 percent.

The proportions of direct and indirect imports of intermediate goods embodied in the outputs of the twenty 2-digit manufacturing industries in 1960 are shown in Table 6. For manufacturing as a whole the ratio of direct imports of intermediate goods to the total output of the twenty 2-digit industries was about 14 percent. The average total (direct and indirect) import content of output in manufacturing -- the estimate for each 2-digit industry being weighted by the relative importance of the production of that industry -- was 21 percent. By the term "indirect import content" of a given industry we mean the amount of imports embodied in those intermediate goods used by that industry that are produced by other domestic industries. The implication of the above is that a 10 percent devaluation would result in about a 2.1 percent increase in the price of manufactured goods *if* the money incomes of the various factors of production (including entrepreneurship) were to remain unchanged. These figures are based on 1960 data. Since then the ratio of direct imports to total gross output of the manufacturing sector has declined somewhat,

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Colombia. If it is assumed that actual investment is 33 percent higher than reported (and profits are higher by that absolute amount) the average profit rate in modern manufacturing in 1964 was closer to 40 percent than 30 percent.

Table 6

TOTAL IMPORT CONTENT OF OUTPUT IN MANUFACTURING, 1960

Industry	Direct Imports of Intermediate Goods as a Proportion of Total Output	Direct and Indirect Imports of Intermediate Goods as a Proportion of Total Output
Foodstuffs	.10	.12
Beverages	.05	.09
Tobacco	.06	.07
Textiles	.11	.15
Clothing	.02	.11
Wood products	.04	.05
Furniture	.03	.07
Paper	.33	.43
Printing	.39	.41
Leather	.09	.11
Rubber	.40	.43
Chemicals	.27	.31
Petroleum	.04	.04
Non-metallic minerals	.09	.13
Basic metals	.08	.16
Metal products	.29	.34
Machinery	.25	.29
Electrical machinery	.45	.48
Transport equipment	.31	.34
Miscellaneous	.33	.36

Source:

Derived from DANE tabulations of the distribution of imports of intermediate goods by industry and an interindustry flow table prepared by Albert Berry of the Yale University Growth Center. The interindustry matrix only reports commodity flows within manufacturing, and is not an input-output table for the economy as a whole. The estimates of total import content are thus underestimated to the extent that manufacturing industries purchase intermediate goods that have a non-negligible import content from other sectors. The estimates also ignore the import content of capital goods used up in the process of production. In notational terms the ith element of the second column is

$$\delta_{ij} \left| I-A \right|^{-1} \left| m_i/x_i \right| ,$$

where δ_{ij} is the Kronecker delta, A is a square matrix whose element a_{ij} is sales of the jth industry to the ith industry as a proportion of total sales of the jth industry, and m_i and x_i are direct imports of intermediate goods and output respectively of the ith industry.

but because the import substitution process has resulted in some increase in the proportion of total gross output of manufacturing industries, the total import content of manufacturing output has not decreased by the same proportion. The total import content of manufacturing output in 1964 was probably about 18 percent.[1]

If price increases resulting from devaluation could in fact be limited to the passing forward of the increased costs of direct and indirect imports of intermediate goods, the inflationary implications of gradual devaluation in real terms of 5 to 10 percent per year would result in at most an additional 1 to 2 percent per year increase in the price of manufactured goods and a somewhat smaller increase in the general price index. The critical question is whether there is a mechanism that causes the money incomes of the various domestic factors of production to be related to the exchange rate. Is there a relationship between wage demands and the exchange rate? Further, is pricing carried out on a cost-plus markup basis that establishes consumer prices as a proportion of average variable cost of production and hence ties the volume of "profits" to the domestic price of imported intermediate goods?

If the experience of the devaluation of late 1962 is ignored, there is virtually no evidence that these mechanisms are operative. The wage rate is not related to the exchange rate in any obvious way.[2]

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[1]Based on a DANE estimate of the ratio of direct imports to gross value of production for the twenty 2-digit industries of .115. Note that this estimate ignores the value of imported capital goods used up in the process of production.

[2]The hypothesis that wages are related to the exchange rate was tested by estimating the parameters of the equation

$$(W_t - W_{t-1})/W_{t-1} = \alpha + \beta\,(E_t - E_{t-1})/E_{t-1} + u_t$$

for semiannual data from 1958 through 1967, the data for the first six months of 1963 being omitted. W is the average value of the DANE index of hourly wages in manufacturing for the period in question; E is the average effective rate of exchange on commodity imports. The null hypothesis that β was zero could not be rejected, the standard error of the regression coefficient being more than twice as large as the coefficient itself. Even less significant results were obtained when a lagged relationship was assumed.

The relationship through time between the price level and the exchange rate appears to be just about what it should be if the mechanism relating devaluation and the price level were limited to the passing forward of the increased costs of the total import content of production.[1]

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[1]The relationship between the price level and the exchange rate was examined by estimating the parameters of the equation

$$(P_t - P_{t-1})/P_{t-1} = \alpha + \beta\ (E_t - E_{t-1})/E_{t-1} + u_t$$

for semi-annual data from the period 1958-1967, P being the average level of the wholesale price index reported by the Banco de la Republica for the six month period in question, and E being the average effective exchange rate on commodity imports for that period. If the price index that excludes foodstuffs is used, and if the data for the first six months of 1963 are excluded, the estimated parameters (the standard error of the regression coefficient indicated within the parentheses) are

$$(P_t - P_{t-1})/P_{t-1} = 3.45 + \underset{(.04)}{.23}(E_t - E_{t-1})/E_{t-1},\ R^2 = .68.$$

The average proportion of total import content of production in manufacturing over the period was on the order of .20. If P is defined as the wholesale price index including foodstuffs, the estimated parameters are

$$(P_t - P_{t-1})/P_{t-1} = 3.47 + \underset{(.07)}{.19}(E_t - E_{t-1})/E_{t-1},\ R^2 = .32.$$

If the data covering the hyper-inflation of early 1963 are included, P being the wholesale price index excluding foodstuffs, the estimated parameters are

$$(P_t - P_{t-1})/P_{t-1} = 3.52 + \underset{(.07)}{.32}(E_t - E_{t-1})/E_{t-1},\ R^2 = .57.$$

The fact that the regression coefficient relating prices to the exchange rate is higher for this period than appears warranted given our pricing hypothesis is the result of a correlation between devaluation and certain excluded variables. If the parameters of the model

$$(P_t - P_{t-1})/P_{t-1} = \alpha + \beta_1(E_t - E_{t-1})/E_{t-1} + \beta_2(W_t - W_{t-1})/W_{t-1} + u_t$$

are estimated, W being the DANE index of hourly wages in manufacturing, the exchange rate coefficient is reduced to the value calculated for the 1958-1967 period when the data for early 1963 were excluded. The actual estimate is

$$(P_t - P_{t-1})/P_{t-1} = .82 + \underset{(.05)}{.23}(E_t - E_{t-1})/E_{t-1} + \underset{(.09)}{.46}(W_t - W_{t-1})/W_{t-1},$$

$R^2 = .84.$

Evidence that the magnitude of the relationship between price changes and devaluation is limited to a shifting forward of additional total import costs is also provided by examining the relative price changes of the 2-digit industries. Our finding is that the relative price change of a given industry during a period of devaluation is correlated with the import content of that industry -- and that the quantitative relationship between these variables is consistent with the hypothesis that domestic factor costs are independent of the cost of imports.[1]

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[1]The simplest interindustry pricing model consistent with the hypothesis that the relationship between devaluation and price change is limited to the shifting forward of total import cost is given by the equation

$$\Delta P_i/P_i = \Delta P^*/P^* \ (1 - (m_i/x_i)) + \Delta E/E(m_i/x_i) + u_i \ ,$$

where P_i is the price of the product of the ith industry, P^* is the common price index of domestic factors and intermediate goods for all industries, E is the exchange rate, and (m_i/x_i) is the ratio of total import content of production to total production of the ith industry. This model assumes no productivity change. If productivity change is uncorrelated with import content (which appears to be the case in Colombia) this pricing hypothesis can be tested by estimating the parameters of the equation

$$(\Delta P_i/P_i)/(\Delta P^*/P^*) = \alpha + \beta \ (m_i/x_i) + u_i^* \ .$$

If the hypothesis holds, the estimate of β should approximate the prespecified value $((\Delta E/E)/(\Delta P^*/P^*) - 1)$. Where P^* is the index of the cost of manufacturing calculated for the earlier discussion of the real effective exchange rate for exporters of manufactured goods, E is the effective rate of exchange on commodity imports, and P_i is the wholesale price index for the ith industry as given by the Banco de la Republica (data being available for all 2-digit industries other than printing) the estimates are

$$(\Delta P_i/P_i)/(\Delta P^*/P^*) = 62.3 + \underset{(.42)}{1.1}(m_i/x_i) \text{ for 1953-1958, and}$$

$$(\Delta P_i/P_i)/(\Delta P^*/P^*) = 113.3 - \underset{(.38)}{.59}(m_i/x_i) \text{ for 1958-1964.}$$

The standard errors of the regression coefficients are given in parentheses. For the earlier period the regression estimate of 1.1 should be compared with the actual value of $((\Delta E/E)/(\Delta P^*/P^*) - 1)$ of .5. Since the nominal and shadow rates of exchange diverged substantially during this period, the finding that the estimated coefficient is

This evidence suggests that the devaluation is associated with inflation in the public mind because of a mistaken inference drawn from the experience following the devaluation of late 1962. The primary factors behind the hyperinflation of early 1963 were the liquidity overhang that preceded the devaluation, the wage legislation, and a shift in price expectations that also predated the actual devaluation. The devaluation itself was chiefly important to the subsequent inflation as a psychological trigger. The proper lesson to be learned from that episode is that an abrupt devaluation may create an environment in which the pace of inflation is likely to increase rapidly -- not that *gradual* devaluation has price implications that transcend the effects of the increased cost of imports.

Exchange Rate Unification

In this section we shift our attention to the structure of exchange rates -- the question of the interrelationships between the rates applicable to different kinds of transactions. It is essential to understand that we are concerned here with effective rates rather than nominal rates. If policy makers were to understand that a nominal exchange rate is chiefly interesting as the most important determinant of an effective exchange rate, the quality of the debate over exchange "unification" would be enormously improved. The important issue is whether Colombia should use a multiple effective exchange rate system.

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somewhat larger than the figure implied by the pricing model is not surprising. This is precisely what one would expect if the users of imported intermediate goods valued these goods at their scarcity price instead of their nominal price. For the later period the value of the term $-((\Delta E/E)/(\Delta P^*/P^*) - 1))$ is -.46. This compares with the regression estimate of -.59. Since the nominal and shadow prices of foreign exchange appear to have moved in a more or less parallel fashion over the 1958-1964 period the consistency of the two figures is what one would expect if the pricing model were appropriate.

The question of whether she should also use a multiple nominal rate system is secondary. As of the summer of 1968, Colombia had achieved the goal of a unified nominal exchange rate that certain of her advisors had been seeking for so long. In spite of this, the structure of effective exchange rates remained as bewilderingly complex as ever. Although there may be good reason to work for a reduction in the dispersion of effective rates -- chiefly through reduction in the dispersion of *ad valorem* tariff rates -- it is not at all clear that the goal of a unified nominal exchange rate is a meaningful objective.

With respect to the structure of effective rates in Colombia, there are four main issues. (1) What is an appropriate relationship between the effective rates of exchange on minor exports and the certificate rate? (2) What is an appropriate relationship between the certificate rate and the effective coffee rate? (3) What is the appropriate relationship between the capital rate and the certificate rate? (4) How much dispersion in the effective rate of imports should be tolerated, and what criteria should be used in setting rates for individual commodities? In general these questions are logically prior to the question of what combination of tax, subsidy, and nominal exchange rate differential should be used to attain the desired structure of effective rates.

The Effective Exchange Rate for Minor Exports. The most important failing of current exchange rate policy is probably the relatively low effective rate of exchange applied to exports other than coffee and petroleum. There can be no doubt that there must be a major expansion in minor exports if Colombia is to achieve the growth targets embodied in the Alliance for Progress goals. There has been ample proof that the dominant constraint to growth is access to foreign exchange. Yet the real effective rate of exchange on minor exports today is at its lowest level since 1960 and considerably lower than it was in the years preceding the coffee crisis of 1957-1958. The evidence given in

Table 4 is that the price stimulus to minor exports has been extraordinarily variable and has not shown any tendency to increase through time.

The first element in an improved exchange rate policy with respect to minor exports is an improved record with respect to the stability of the real effective exchange rate. Exporting is more than a simple matter of meeting a price. It is also a matter of making a market, and Colombian firms cannot be expected to assume the costs of establishing marketing relationships if the future real effective exchange rate is highly uncertain. The second element in this policy reform is an increase in the real effective rate. If, as we have urged in an earlier section of this chapter, the certificate rate were allowed to increase at a rate that is related to but somewhat higher than an index of domestic costs, the problem of instability of the real exchange rate would be more or less taken care of. We have argued, however, that it is preferable to secure convergence of the effective and shadow rates of exchange through a policy of gradual increase of the real certificate rate rather than through a large, abrupt devaluation. Yet if the "gradualist" approach to changes in the real certificate rate is adopted, there is some question as to whether the price incentive for minor exports would be adequate in the immediate future. We think these doubts are well founded. Considering the great need to expand minor exports as quickly as possible -- and further that the short run elasticity of exports with respect to the effective exchange rate is fairly high -- we therefore feel that an immediate increase in the differential between the effective rate on minor exports and the certificate rate is called for.

There are three arguments against this policy change. The supply response is not likely to be very important. The government cannot bear the revenue costs of increasing this rate. An effective export rate that is in excess of the effective import rate will encourage the re-export of imports.

None of these arguments appears very persuasive. We have already presented evidence that the response of agricultural and nonagricultural

minor exports to a change in the exchange rate is likely to be substantial even in the very short run. It is also hard to understand why the revenue issue bears so heavily on the thinking of many individuals within the Colombian government. For example, an increase in the cost of the minor export subsidy could be more than compensated for by the greater tariff revenue resulting from an increase in the certificate rate and the increment in exchange profits resulting from a policy of allowing the effective rate on coffee to increase less rapidly than the certificate rate. The problem of differential export and import rates is potentially real but of second-order importance. If the Plan Vallejo program were amended to eliminate the tariff rebates but retain the free import feature, the present rate structure could take a substantial relative increase in the minor export rate without leading to a re-export problem.[1] Such a reform would also have the advantage of eliminating a discriminatory differential between agricultural and manufactured exports, although it might prove necessary to reduce the dispersion of tariff rates before the rebate incentive could be safely replaced by incentives in the form of exchange differentials or tax credits. In any event, the re-export problem is not likely to prove quantitatively important unless the ratio between the effective minor export and certificate rates exceeds perhaps 1.5 to 1.

In the short run, at least, we feel that the argument for an increase in the effective exchange rate on minor exports relative to the certificate rate is persuasive. How much the existing differential should be increased and how long it should be maintained will depend upon the future history of the certificate rate and the future differential between the certificate rate and the effective rate on imports. There is little basis for arguing for any particular differential. To some extent at least an experimental approach is called for. Assuming a 5-10 annual rate of increase in the real certificate rate an immediate increase of 20 percent in the effective minor export rate relative

[1] By "free" import procedure we mean the ability to import free of licensing restrictions. It is very important that this aspect of Plan Vallejo be retained.

to the certificate rate does not seem unreasonable. One way of implementing this additional incentive is to establish a differential export rate. Another is to utilize the existing tax certificate system but increase the value of the tax bonus. If the latter scheme is adopted it would make good sense to validate the certificates as of the date of issue rather than one year from date of issue as is the present practice.

The Effective Exchange Rate for Coffee. The second main issue with respect to the exchange rate structure is the level of the coffee rate. In certain respects the current system is quite adequate. The principle of tying the coffee rate to a certificate rate that has drifted with relative changes in domestic and international prices eliminates the necessity of periodically adjusting the coffee rate to compensate for domestic cost increases. This arrangement also presumably increases the political support for a quasi-flexible main exchange rate. There is no doubt that the present system of a proportional differential is preferable to the previous system of fixed rates. The problems of what the proportion ought to be and whether it should vary in response to cycles in the international price of coffee remain. Unfortunately, although the main thrust of the economic argument with respect to the size of the relative coffee differential is reasonably clear -- the current differential is too small to provide a price incentive that is appropriate to the fact that production is well in excess of marketing possibilities -- it is not very relevant. The problem of policy toward the coffee sector is very complex both politically and economically, and it is not possible to present an adequate discussion of the problem within the confines of this study.

A few very general policy remarks will be made, however. Although there is some danger that a differential, once reduced, will never be increased, and although such a policy might create certain fiscal difficulties, it seems desirable to establish the principle that the proportionate difference between the coffee rate and the certificate rate should vary inversely with the international price of coffee. The point here is to insulate Colombia from the income effects of perturbations

in the international market that are not thought to be permanent. It also is desirable to establish the principle that the average proportion of the differential should increase gradually with time so long as the coffee supply exceeds the sum of domestic demand and export possibilities. Whether it is politically feasible to do so remains to be seen. In any event, the attempt to solve the problem of excess coffee production should involve other policy instruments as well as changes in the effective exchange rate on coffee exports.

Unification of the Capital Rate and the Import Rate. The issue with respect to unification of the certificate and capital rates is unduly muddied with confusion between the notions of nominal and effective exchange rates. In the early summer of 1968 the certificate and capital rates were more or less unified. But unification of nominal rates in this case implied a multiplication of effective rates. The freezing of the nominal capital rate in late 1966 resulted in a gradual erosion of that rate relative to the effective rate on commodity imports to the point that in July 1968 the latter was 20 percent higher than the former, a differential higher than the one prevailing before the unpegging of the "free" rate in late 1964. If this differential were the product of a conscious policy decision to subsidize the purchase of dollars in the capital market it could be more easily defended than it can be as the product of a decision to achieve exchange unification. There appears to be a good deal of dogma involved here. The classic argument for unified exchange rates is predicated on the objective of eliminating the resource misallocations that are produced by distortions of relative prices. It is hard to see the compelling force of the argument when an elaborate set of taxes and subsidies exists. In the case of Colombia, it seems more likely that a differential capital rate is more likely to correct than create price distortions.

In the current situation the effective rate of purchase of services (insurance, freight, and so on) is less than the rate on purchase of commodities. There does not appear to be any good reason why this should be. With respect to capital movement the influence of price on

net capital flows is probably secondary so long as the current system of rigid control of capital export -- either by Colombian nationals or as repatriated profits by foreigners -- continues in force. Whether or not the policy of limiting profit repatriation to 14 percent of registered capital imports will result in a net decrease in the excess demand for dollars is hard to judge. In the long run we suspect it will result in a decrease in foreign investment that exceeds the decrease in profit repatriation. Certainly so long as capital flows are as rigidly controlled as is the case today, the allocative effects of a differential between the effective rates on capital and commodities are of secondary importance. If these controls are to be relaxed, as they surely will be in the future, it does seem important to set a rate that does not encourage the purchase of dollars for foreign travel or export of capital relative to dollar purchase for the purpose of commodity import. If anything, it would seem that a policy of "taxing" such transactions through an exchange differential would be in order.[1]

In the long run Colombia must face up to the choice of establishing an exchange tax or exchange differential relative to the certificate rate on purchases of dollars for purposes other than commodity import or returning to the system of separate markets for transactions originating in capital and commodity flows. The policy choice here is complex, and an adequate discussion of the advantages and disadvantages of the competing systems is beyond this Report. A reasonably good case could be constructed for a system of separate markets if the capital rate were to be set at a level substantially higher than the current certificate rate and if the "real" value of this rate were to be maintained through frequent small changes in accordance with the pace of domestic inflation. In this system the real capital rate could serve as a medium run target for the rate in the certificate market -- the announced objective being unification of the capital rate and the

[1]The fact that imports can be over-invoiced and exports can be under-invoiced provides an argument for keeping such a capital rate differential reasonably small, however.

effective rate on commodity transactions within a specified time. The presumed advantages of such a system would be the encouragement it would give to immediate repatriation of liquid funds invested abroad and the reduced attractiveness of dollar assets relative to peso assets during the period of transition from the disequilibrium system to a system of free or quasi-free market equilibrium. A system of exchange differentials would have essentially the same effect if the differential were scheduled to decrease through time. Unless capital flows outside the official market can be kept to relatively low levels, an exchange system of this type may well be required if the gradualist approach to the problem of increasing the real certificate rate is to be adopted.

A system of separate markets is likely to be more difficult to administer than an exchange tax or exchange differential on capital flows, however. The large devaluation in the capital rate that is a prerequisite to a sensible system of dual exchange markets is also rather more likely to become a political *cause celebre* than an exchange tax that is announced as a temporary measure. That appears to us to be the critical issue, and the recent monetary history of Colombia suggests that rapid movement of the capital rate is about as likely to create a destabilizing shift of wage-price expectations as is a change of the rate applicable to commodities. There is, in fact, little reason to argue that either the dual market or the fixed differential system is unambiguously preferable. For our purposes, the most important issues are that the Colombian authorities understand both that the goal of unified nominal rates of exchange for capital and commodity transactions is of spurious significance and that their current success in repressing capital export by rigid administrative controls is bound to erode through time.

The Tariff System: Dispersion of the Effective Import Rate. The fourth main issue with respect to the structure of effective exchange rates is the tariff. There are really two separate issues. The first is the question of what the average level of the tariff should be. The second is the question of how much dispersion in tariff rates

should be allowed and what criteria should be used in establishing the rate structure. The dispersion issue is the more critical problem and will be the focus of the discussion here. If policy with respect to the effective rate for minor exports and the capital rate could be coordinated with the policy on the effective rate for imports, the question of the average level of the tariff would reduce to the question of the extent to which the effective import rate target should be achieved through increases in the certificate rate as opposed to increases in the tariff structure. If the issue of future tariff arrangements within LAFTA or the Andean Federation is ignored, this is largely a matter of revenue objectives and lies outside this discussion. There are several reasons for arguing that the average tariff be kept to a moderate level, however. If the import rebate feature of Plan Vallejo is retained, a high tariff level might constrain the size of the tax subsidy or rate differental that can be accorded to minor exports. This constraint would follow from the argument of those who are concerned about the re-export of imports. If this constraint were to materialize it would result in unfair discrimination against the export of agricultural commodities. Another reason to limit the size of the tariff is the fact of the privilege of tariff exemption for public agencies and certain "basic" industries. We think there is good reason to eliminate, or at least substantially reduce, the exemption privilege; but if that is not possible, the extent to which it leads to resource misallocation should be controlled by limiting the tariff average.

In the past the major influence on allocation of imports has been licensing procedure rather than tariff structure. Even so, the influence of tariff protection has been felt; and if Colombia is to try to establish a foreign exchange market that is considerably freer from administrative control, the allocative importance of the tariff structure will increase drastically. There is an enormous degree of dispersion in the current tariff structure. For example, the range in tariffs on automotive vehicles is from 2 to 450 percent. For clothing the range is from 5 to 250 percent; for basic iron and steel items the range is 10 to 100 percent. Because of this high degree of dispersion

it is difficult to assess the extent to which tariffs actually serve their protectionist function simply by looking at arithmetic averages of the rates within a particular commodity group. On goods imported, the average tariff in 1967 was about 22 percent. By type of import this average rate varied from 11 percent on intermediate and capital goods for agriculture and 13 percent for capital goods for the non-agricultural sector to 42 percent for transportation equipment and 49 percent for "unclassified" items. The rates on consumer goods other than automobiles and intermediate goods for manufacturing were close to the aggregate mean -- 24 and 25 percent respectively.

The above figures refer to goods actually traded and give no indication of the extent to which the tariffs may actually have been prohibitive. If some tariffs are meant to be prohibitive, the arithmetic means of the rates within a given tariff section will tend to be substantially higher than the mean rate actually collected. That, of course, is the case here, the disparity coming out most strongly in the consumer goods sector. Although the average of traded commodities (excluding automobiles) was only 24 percent, the mean rates of those tariff chapters covering consumer goods tend to fall in the 75-100 percent ranges. The mean rate on clothing, for example, is about 90 percent; metal manufactures, 93 percent; clocks, optical instruments, and musical instruments, 65 percent; furniture, 120 percent; miscellaneous manufactures, 90 percent.

The most relevant measure of the magnitude and dispersion of tariffs in Colombia would be the weighted average tariff on final product and intermediate goods by industry where the weights were actual production or consumption data. A variant of this measurement is given in Table 7. The "tariffs" given there embody both the nominal tariff and an *implicit* tariff on goods whose importation into Colombia is forbidden.[1] The allowance made for "implicit" tariffs is excessive, but the difference between the tariff averages of Table 7 and the mean tariff on goods actually traded is very large even for those industries

[1]See Table 7, note a, for a discussion of how this "implicit" tariff has been measured.

Table 7

AVERAGE TARIFFS ON OUTPUTS AND INPUTS BY INDUSTRY IN 1966[a]

(1964 commodity weights)

Industry	Average Rate on Final Products	Average Rate on Intermediate Products
Foodstuffs	206%	173%
Beverages	195	160
Tobacco	301	192
Textiles	170	137
Clothing	500	177
Wood products	227	186
Furniture	400	177
Paper	200	135
Printing	236	64
Leather	123	191
Rubber	196	56
Chemicals	94	105
Petroleum	107	103
Basic metals	44	43
Non-metallic minerals	127	140
Metal products	177	50
Machinery	187	91
Electrical machinery	150	142
Transportation equipment	260	75
Miscellaneous industry	239	177

Note:

[a]The measured tariff in these calculations combines both the nominal tariff and an estimated "implicit" tariff on goods whose importation is prohibited. In the latter case the Argaez-Plazas assumption was that the ratio of Colombian prices to world or import prices was $2(1+t)$ instead of $(1+t)$, t being the tariff rate. The "implicit" tariff on prohibited goods is thus $[2(1+t)-1]$ or $(1+2t)$ instead of the actual tariff t. Although it does seem useful to make some allowance for the price effect of import prohibition, the assumption actually used in these calculations allows for much more of a price effect than appears reasonable. This shows up particularly in the figures for the furniture and clothing industries, the importation of a large proportion of the output of those two industries being on the prohibited list. Unfortunately we did not have the information needed to recalculate the "implicit" tariff for less extreme assumptions.

Source:

G. Argaez and C. Plazas, *Estudio Preliminar Sobre la Eficiencia de la Industria en Colombia,* Departamento Administrativo de Planeacion, unpublished manuscript.

not much affected by import prohibition. It should be abundantly clear that the average of tariff rates actually collected is irrelevant as an index of the protective importance of the tariff system.

If the allowance made for the implicit tariff embodied in import prohibition were appropriate and if the nominal tariff system contained no "water" (rates higher than needed to prevent any importation of the good in question), the tariff structure given in Table 7 could be used to establish the relationship between domestic and international prices. In actuality the ratio of domestic to international prices is considerably less than is implied by the assumption that the price difference is equal to the tariff. In the first place the estimate of the implicit tariff resulting from import prohibition that is embodied in Table 7 is excessively generous. In the second place many Colombian tariffs are meant to be prohibitive. It is difficult to obtain meaningful estimates of the international prices of goods produced in Colombia but not imported -- the major problem being that of product comparability with respect to quality -- but a few estimates as to the ratio of domestic to international prices (directly measured instead of hypothesized) are available. Figures for six 3-digit manufacturing industries are presented in Table 8. By and large the figures for these industries are free from the influence of the estimate of "implicit" tariffs. The ratio of domestic prices to actual international prices is very close to the ratio of domestic prices to hypothesized international prices for the case of the goods used as inputs. For final products the measured difference in price is generally quite a bit less than the hypothesized difference -- strong evidence that many Colombian tariffs are meant to be completely prohibitive. The problem of standardizing for product quality is severe enough to make this type of measurement extraordinarily hazardous, but the data do ring more or less true.[1] For example, the finding that Colombian

[1] We suspect that the estimates given in the first column of Table 8 are biased downwards. The data on international prices of goods not imported into Colombia were taken from Peruvian import records. Our suspicion is that the average quality of goods in international trade is higher than the quality of Colombian products where there is no effective competition from imports. This is certainly the opinion of most Colombians.

Table 8

DIRECTLY MEASURED AND HYPOTHESIZED RATIOS OF COLOMBIAN AND INTERNATIONAL PRICES IN 1964[a]

Industry	Final Products		Intermediate Goods	
	Measured Ratio of Colombian to International Prices	Hypothesized Ratio of Colombian to International Prices	Measured Ratio of Colombian to International Prices	Hypothesized Ratio of Colombian to International Prices
Rubber tires	.85	2.05	1.28	1.23
Essential chemicals other than fertilizers	1.00	1.21	1.16	1.28
Wood pulp	1.18	1.84	1.24	1.22
Cooking equipment, non-electric stoves	1.27	2.03	1.20	1.23
Cotton textiles	1.75	2.51	1.27	1.27
Electric wire and cable	1.77	3.27	1.38	1.36

Note:

[a]The hypothesized ratio of Colombian and international prices is $(1+t)$ for the case of goods whose importation is not prohibited and $\lambda(1+t)$ for the case of prohibited goods. "t" is the *ad valorem* tariff rate and λ is an exchange rate differential. The calculations given here are based on the assumption that $\lambda = 2$. We feel this to be excessive, but we have no way of recalculating the estimates for lower values of λ.

Source:

G. Argaez and C. Plazas, *Estudio Preliminar Sobre la Ejiciencia de la Industria en Colombia*, Departamento Administrativo de Planeacion, unpublished manuscript.

prices on tires are less than international prices is consistent with Colombia's export record.

The previous discussion has been oriented to the height and dispersion of nominal tariffs. From the point of view of effect on resource flow, however, the relevant variable is the effective rate rather than the nominal rate. By "effective" rate we mean the percentage increase in value added in manufacture that is made possible by the tariff structure.[1] Where tariffs on inputs are less than the tariff on output, the effective rate exceeds the nominal rate. For a given set of tariffs the spread between the nominal and effective rates will be greater the larger the ratio of the value of intermediate goods to the value of final product (at international or pre-tariff prices). Since much of Colombian industry utilizes highly fabricated imported inputs (as measured by the ratio of value of intermediate products to value of final product) a fairly small difference between

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[1] In algebraic terms the effective tariff rate is (V-W)/W, where W is value added at world prices and V is value added at domestic prices, the assumed difference between world and domestic prices being the tariff. This reduces to $(t_f - at_i)/1-a$ where t_f is the average tariff on final product, t_i is the average tariff on intermediate goods (weighted by the share of each intermediate good in the pre-tariff cost of production of the final product in question), and a is the pre-tariff ratio of the value of all intermediate goods to the value of final product. The object of this reformulation of the concept of protection is to provide an ordinal index of the likelihood that the tariff structure will in fact induce a net inflow of resources into a given sector. There are in fact a number of conceptual difficulties with this definition. In particular, the justification for expressing protection in terms of pre- and post-tariff value added depends upon the assumption that all resources other than intermediate products are not in infinitely elastic supply. In the case of Colombia a strong case can be made for the assumption that most classes of labor are in something like infinitely elastic supply to producers in the modern sector. In this case labor should be treated as an intermediate good with zero tariff, and the rate of effective protection is the proportionate increase in factor payments other than wages made possible by the tariff. In this case the levels of effective protection will be much higher than those given by the definition first proposed. For a discussion of these problems see W. M. Corden, "The Structure of a Tariff System and the Effective Protective Rate," *Journal of Political Economy*, LXXIV, No. 3, June 1966.

the nominal rates on output and input may result in a substantial difference in the nominal and effective rates of protection.

In general, Colombian tariffs on final products are greater than the rates on intermediate goods, and the effective rate of tariff protection is thus in excess of the nominal rate. According to the tariff structure of June 1966 the average rate on intermediate goods was less than that on final product on all but three of the twenty 2-digit manufacturing industries.[1] In well over half the cases the difference between rates on input and output was substantial. In addition, there appears to have been a strong tendency for those industries with the highest rates of nominal protection on output to enjoy the highest ratios of output tariffs to input tariffs.[2] The implication of this finding is that the dispersion of effective tariff rates is even greater than the dispersion of nominal rates.

There are a number of reasons why this state of affairs is unsatisfactory. Part of the reason why there is so much dispersion in the existing tariff structure is that the tariff system was designed as a multipurpose device, combining the functions of protecting domestic industry and taxing consumption goods of low social priority.[3] If these goods were all items unlikely to be produced in Colombia the problem would be less severe. In fact, many items subject to a

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[1]Based on the data of Table 7. Since import prohibition is more common among final products than intermediate goods, there is something of an upward bias in these estimates of the difference between tariff rates on those two classes of goods. As near as we can judge, however, the general tendency for rates on final products to be higher than rates on inputs holds even in the absence of an estimate of "implicit" tariffs.

[2]The Spearman rank correlation coefficient between the height of the tariff on final product and the ratio of tariff rate on final product to tariff rate on inputs, according to the data of Table 7, is .80. The evidence of association between these variables is significant at the 99 percent confidence level. Note that this relationship holds even though the absolute value of input and output tariff appears to be somewhat correlated.

[3]For a good discussion of the criteria used in the tariff reform of 1964, see A. Urdinola, *Teoria y Practica de Aranceles en Colombia*, Bogota, Departamento Administrativo de Planeacion, 1968.

"consumption" tax are being manufactured domestically or are likely to be produced domestically in the reasonably near future. In most cases the domestic product is not subject to a compensatory excise tax. As a result, a very high tariff that was instituted as a joint protective device and consumption tax reduces to a simple protective device whose effective rate of protection is higher than was planned by the policy makers who established the criteria for the tariff structure. The remedy is conceptually simple if administratively and politically difficult. Domestically produced consumer goods that fit into the luxury or semi-luxury categories (and hence are subject to higher than average tariffs) should be made subject to an excise tax of the amount of the "surplus" tariff. An even better solution would be the elimination of super tariffs whose origin is in the desire to tax consumption and establishment of an *ad valorem* excise tax on all goods that fall into the luxury or semi-luxury category. An obvious case in point is the automobile industry.

Another unsatisfactory characteristic of the current tariff structure is the amount of "water" in the system. Where the rate of protection completely eliminates the possibility of import, the salutary effect of the latent threat of price competition from importers is also eliminated. In a small economy this is particularly important. In many instances the relationship between optimum plant size and size of the total domestic market precludes competition among domestic producers. Production will often necessarily be sold under terms of full or partial monopoly, and in such cases the price discipline imposed by the threat of importation is likely to be the only efficient means of restraining monopoly profits to tolerable levels. To a large extent we suspect that the "water" in the tariff structure is a legacy from the days of a fixed nominal exchange rate -- the excess tariff being designed to protect domestic producers even during those periods immediately preceding devaluation when the "real" exchange rate had sunk to subnormal levels. Hopefully, the necessity for that sort of protection has been eliminated.

Still a third unsatisfactory characteristic of the current tariff structure is that (to the extent it is known) the effective rate of

protection is even more variable than the nominal rate. That the effective rate structure is known only vaguely is itself an indictment of the system. Where the tariff is established on a line-by-line review basis it is virtually impossible to secure a system that does not imply a variable and capricious structure of effective protection. To the policy maker the notion of an "effective" tariff may seem arcane or unimportant. As economists we can only reiterate that the effective rate is immensely more relevant to the resource allocation effects of the tariff than the nominal rate. The fact that the effective rate is often difficult to conceptualize, much less measure, should not be used as an argument to dispense with the concept. A more rational conclusion would be to work toward a more uniform tariff. If all tariffs were identical, the problem of conceptualizing and measuring the effective tariff would be more manageable.

The common thread in the above discussion is the problem of tariff dispersion. There is no doubt that the variation in tariff rates is excessive and that continued permissiveness with respect to the establishment of super tariffs will lead to distortions in resource allocation that are even more serious than those accruing from the import substitution policies of the past. The point is not academic. In the past, import substitution has been concentrated in those consumer goods industries that are less complex technologically. If Colombia is to continue to subsidize import substitution through tariff policy she will find that the increased requirements for highly skilled manpower (or decreased relative productivity of the less skilled workers) and the higher rate of technological change characteristic of most intermediate good and capital good industries will result in a demand for an even higher degree of effective protection (and an even lower chance of future export) than has been required by import substitution industries in the past.

From a conceptual point of view it is reasonably clear what sort of policy change is in order. From an administrative or political point of view, however, it is very difficult to formulate an optimal strategy of tariff revision. In an ideal sense Colombia would do well to move to a policy of a uniform tariff subject to exemption. The

criteria for determining the admissibility of exemptions should be closely specified. The upper limit for exemptions should be fixed and (hopefully) defined in terms of effective rather than nominal protection. By and large the exemptions should be limited to preventing disruption of local industry through the "dumping" of foreign products in Colombia and the establishment of *temporary* protection differentials for new industries or established industries that would have difficulty in surviving the period of transition to the new system. Exemptions in the form of subnormal tariffs should be discouraged as a matter of general policy. They should be granted only as part of a larger policy of subsidizing a reasonably aggregative sector, such as agriculture, if the government believes such a subsidy might lead to increased economic efficiency in the long run.

The obvious trick is to establish an administrative system that can formulate exception criteria in specific terms and, more important, discriminate administratively between exceptions that are permissible and nonpermissible according to those criteria. It is difficult to be optimistic about the possibility of accomplishing this. Administration of the exception process has a very strong tendency to weaken the underlying criterion of tariff uniformity to the point where the system degenerates into a line-by-line review tariff, with individual tariff variations dependent upon the relative bargaining strengths of the various domestic producers. Although part of the dispersion in tariffs results from the government's notion as to social priorities, a larger part is the result of such a series of bargains between the government and individual petitioners. The process is a continuing one with the natural result that there is a tendency for tariff dispersion to increase over time. A case in point is the joint study of the metal working industry by the Industrial Development Institute and the industry's trade association. The conclusion of this study was that the tariff system should classify imports more finely so that finished products (to be given a high tariff) could be more easily distinguished from intermediate goods (to be given a low tariff). If the conclusions of this study were to be accepted as the basis for policy, the dispersion of effective protection would be increased even further and

Colombia would undertake yet another foray into an area of competitive disadvantage.

Tariff reform can be achieved only if the criteria for exemption are limited in number and more or less automatic in application. The administrators of the tariff system must be able to plead an incapability of dealing flexibly with the problems of individual producers. Without this protection they will be extremely vulnerable to bargaining pressure. There is also the question of whether the tariff bureaucracy has access to the kind of information needed to administer a complex set of criteria of exceptions. One possible basis of reform that appears administratively feasible is to permit all producers who are currently enjoying higher rates of protection than the rate of the new common tariff to obtain a tariff differential that is initially equal to their current rate (up to some agreed maximum) but declines through time according to a prespecified schedule. A similar privilege could be offered new industries. Both a maximum initial tariff differential and a time schedule for the reduction and eventual elimination of this protection should be specified. The quest for administrative simplicity suggests that maximum protection be stated in terms of nominal rather than effective rates. What this maximum rate ought to be is beyond the scope of this study.[1] In large part this will depend upon the Colombian government's choice between manipulation of the certificate rate and rate of the common tariff as a means of reducing the excess demand for foreign exchange.

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[1]The discussion of a likely rate for the "uniform" and maximum tariffs contained in the monograph *The Colombian Tariff, 1965-1968* (Bogota, USAID, April 4, 1968) by Francis Masson and Dolores Lindsey is the only disquieting portion of an otherwise informative and thoughtful treatment of the problem of improving Colombian tariff policy. The problem here is that the authors have characterized current tariff policy in terms of the average rates collected on goods actually traded. As was stressed earlier, such figures ignore the impact of tariffs that are prohibitive or severely restrictive. The suggested "uniform" rate of 25 percent would almost certainly lead to an uncomfortably large increase in the demand for imports unless the "real" certificate rate were allowed to increase substantially.

With respect to temporary tariffs to prevent "dumping," a somewhat more flexible policy might be adopted, but the principle of periodic review (and absolute time limits) should be clearly established. The more difficult question is how to design a tariff system that can successfully resist pressures to permit goods not currently produced in Colombia to come in at rates less than the common tariff. The success of Avianca in securing a reduction in the rate on jet aircraft that was proposed in connection with the 1964 tariff reform is a good example of this sort of pressure at work. From the point of view of resource allocation, such exemptions may not be of exceptional importance. In principle, of course, they inevitably encourage the substitution of imported capital equipment for domestic labor and reduce the incentive to search for domestic substitutes for imported products. In fact, however, the choice of technology may be so dominated by considerations other than price or may appear to involve such a limited range of alternatives that the tariff differential does not induce any appreciable net change in resource allocation. Nevertheless, there is good reason to resist exemptions on products where there is no existing demand for protection. Although tariff exemptions of this sort may not lead to appreciable misallocation of resources, they do complicate the administration of exception criteria in general and increase the probability that a line-by-line bargaining process will be reinstituted. For this reason it seems important that the above type of exemption be prohibited except in conjunction with a policy package aimed at a fairly aggregative sector such as agriculture. If that is not deemed administratively or politically feasible, it will probably be necessary to establish the uniform tariff at a fairly low level if a large dispersion of tariff rates is to be avoided. This would eliminate much of the pressure on the tariff administration but would create revenue problems and shift more of the burden of achieving an adequate level of "protection" to government policy with respect to the certificate rate.

The above discussion has ignored the question of tariff negotiations within the Andean or LAFTA groups. By and large we see no particular conflict between the general tariff policy discussed here

and the tariff revisions that might be forthcoming under multi-national trade agreements. The major potential problem would appear to be the posibility that the Andean bloc might press for increased tariffs on goods produced outside the group. This should be assiduously avoided.

Trade Liberalization

We stressed in the introduction to this chapter that many kinds of instruments and policies are involved under the heading of "foreign exchange policy." In this section we want to focus on the issue of quantitative import restrictions as a determinant of the exchange rate structure. This policy question is usually posed under the heading of "trade liberalization." In operational terms "trade liberalization" should be understood in this case as meaning increasing the proportion of commodities that can be imported free of licensing restrictions. Current import policy places a commodity in one of three groups: the "free" list or automatic license list; goods whose import depends upon administrative approval of the Superintendencia de Comercio Exterior -- the prior license list; and goods whose import into Colombia is prohibited. The makeup of each list varies over time. At the time of the exchange crisis of Novermber 1966, 22 percent of the total number of items on the tariff list were in the prohibited category. The remaining items were split equally between the free list and the prior license list.

There is no question but that the drastic reduction of the degree of administrative control over importation is a crucial objective of policy reform. There is some question, however, as to how quickly and in what manner these administrative controls should be relaxed. It is not clear at all that the sudden elimination of the prior license requirement for a large segment of imports is either feasible or desirable. The problem is that although the privilege of importation free of administrative control is a necessary condition to the establishment of an equilibrium exchange system, it is by no means a sufficient condition. This is too obvious to be worth mentioning in a fixed exchange rate system. It is not obvious given the existence of

an auction system such as the certificate market; for when we speak of a government policy with respect to the certificate rate we chiefly mean government import licensing practice. Under current arrangements a substantial degree of trade liberalization would imply something like a freely floating exchange rate system for commodity based transactions. This is a valid long run objective, but it is our contention that the state of disequilibrium in the foreign exchange market is so severe at current effective exchange rates that any abrupt relaxation of administrative control over licensing in the immediate future would result in an increase in the certificate rate that would be sufficiently large to imperil the certificate system itself.

We wish to stress that our concern is not with the desirability of trade liberalization *per se* but with the rate at which trade liberalization is introduced. It is exceedingly important that there be no repeat of the 1966 exchange crisis, a debacle in which the very rapid rate of trade liberalization played an important role. A further crisis of similar origin would enormously strengthen the bargaining position of those individuals within the various Colombian power elites who are distrustful of any foreign exchange policy but the disequilibrium system (allocation by administrative decision). Each of the recent exchange crises has left a residue of "lessons learned." That these lessons are largely mistaken inferences is less important than the fact that they are widely "understood." The inflationary spiral that followed the abrupt devaluation of late 1962 is understood as having "proved" that devaluation is an unacceptable policy alternative because it is excessively inflationary. The inability of the government to maintain substantially free importation in 1966 in spite of a fairly rapid depreciation of the effective exchange rate has similarly "proved" that fairly rigid administrative controls over imports are necessary. To some extent at least a mechanism for the self-fulfillment of this prediction has been created, for many firms in Colombia in 1966 misread the likelihood that free importation could be sustained almost as completely as did those individuals who were responsible for the liberalization decision. Such firms made decisions to expand productive capacity but neglected to acquire surplus inventories of intermediate

goods. They are unlikely to chance the same mistake again, and the inventory purchases following trade liberalization in the near future are likely to be particularly high.

The linkage between trade liberalization and the certificate rate of exchange is obvious. To secure the necessary increase in the real certificate rate there must be a gradual relaxation in the severity with which the quantitative controls over imports are administered. In the very short run, however, we suspect that a progressive relaxation of the quotas utilized in the import licensing process is preferable to an actual transfer of goods from the prior license list to the free list. The chief argument for this policy choice is that it is extremely difficult to predict the short run changes in demand for a given class of imports that would follow an elimination of quantitative controls over that class. If the surge of demand for imports following decontrol were to be substantially larger than anticipated -- as was the case in 1966 -- quantitative controls would have to be reimposed, and the private sector's confidence in the ability of the government to accelerate the pace of growth would be further diminished. This would be a critical setback. No matter what strategy of trade liberalization is followed, the key objective must be to prevent any changes in the certificate rate that would be sufficiently abrupt to increase the anti-devaluationist political pressured on the government and create an *ambiente* that would imperil the government's ability to control the monetary situation and pursue a policy of wage restraint.

These strictures have been aimed at trade liberalization in terms of the shift of commodities from the prior license list to the free list. A considerably less cautious approach to the question of reducing the prohibited list is in order.[1] The policy of guaranteeing freedom from import competition, given evidence of the capacity to supply the domestic market at a "reasonable" price, has led to many instances of abuse. These have chiefly taken the form of inadequate control over quality of product rather than price gouging. The

[1]The tariff on such commodities generally appears to be quite high.

qualifying phrase "at a reasonable price" suggests the remedy. Protection should be achieved through temporary tariffs (and an adequate certificate rate) rather than prohibition. Where the impulse toward prohibition may have arisen from some notion of social priorities, a more appropriate remedy is a super excise.

If an acceptable tariff reform could be achieved -- and if the use of import prohibition as a protection policy could be drastically curtailed -- a policy of gradual trade liberalization should probably be applied with similar force to intermediate and capital goods. Until these prerequisites are met, however, there is good reason to retain fairly complete administrative control over the importation of capital goods. The point of doing so is to prevent investment in areas that are "super protected" by tariffs or import prohibition. It is extremely important that there be some means of control over the economic rationality of the import substitution process. Until the jungle of price distortions that has grown up as a byproduct of the disequilibrium system is removed, the licensing system appears to be the only means of accomplishing this.

Increasing the Effectiveness of Fiscal-Monetary Policy

The stagnation and instability that Colombia has experienced over the last five years provides empirical support for the point that will be developed theoretically in this section. That is, the power of monetary-fiscal policy to achieve growth and stabilization objectives is very limited if the exchange rate structure is not consistent with these objectives. In the United States the small role of foreign trade means that, within a considerable range, growth and employment objectives can be achieved without constant attention to the balance of payments. For a relatively small country with a negligible capacity to produce capital goods, the situation is very different.

Proposals to supplement aggregate demand through an expansionary fiscal-monetary policy tend to run aground on the problem of the

balance of payments constraint.[1] It does no good to argue that the direct import content of government expenditure can be very small; a large increase in the demand for imports will result from the secondary income effects of that program. The foreign exchange constraint also limits the ability of the government to shift the consumption-investment mix. First, because of the differences in the import content of consumption goods and investment goods, the cost of higher investment in terms of reduced consumption will be much higher than in an economy not subject to an exchange constraint. Second, because of the differences in the labor intensity of production of consumption and investment goods, an increase in the ratio of investment to consumption will imply a lower rate of growth of total employment.

If factor substitution is impossible, or if it is impossible to change relative factor prices, an import constrained economy such as that of Colombia will find it virtually impossible to influence her own growth and employment record in any significant way through monetary-fiscal means alone. This is the implication of those analyses of development possibilities that are identified under the heading of "two-gap" models.[2] The assumption that relative factor prices do not change, or that if they do change, factor proportions do not respond to that change, is critical to this finding, however. The apparent necessity for sacrificing employment growth to secure an increase in the ratio of investment to consumption depends on the assumption that a decrease in the wage rate relative to the cost of capital goods (in particular, imported capital goods) will not induce a decrease of the capital intensity of production. The apparent impossibility of reducing unemployment through expansionary monetary-fiscal policy depends on the assumption that the import content of output is insensitive to the real exchange rate.

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[1]For example, see L. Currie, *Accelerating Development: The Necessity and the Means*, New York, McGraw-Hill Book Company, 1966.

[2]See, for example, H. Chenery and A. M. Strout, "Foreign Assistance and Economic Development"; and H. Chenery and P. Eckstein, "Development Alternatives for Latin American," unpublished paper.

In the very short run the assumption that factor substitution is quantitatively unimportant is quite realistic. When the focus is on the long run this assumption is absurd, for factor substitution is, or ought to be, a major objective of development policy. The chief public instruments for inducing factor substitution are exchange rate policy, wage policy, and monetary policy. In Colombia at least, exchange rate policy appears to be the key. If employment is to be increased without reducing the ratio of investment to consumption, it will be necessary to increase the exchange rate relative to the wage rate. The resultant reduction of labor costs relative to capital costs will induce the substitution of labor for capital. The reduction of domestic prices relative to import prices will induce the substitution of domestic products for imports. The policy requirements for solving the related problem of increasing the ratio of investment to consumption without reducing the demand for labor are symmetrical. An increase in the exchange rate relative to the wage rate will reduce both the capital intensity of production and the import intensity of investment.

When factor substitution possibilities are considered, the sharp distinction between growth as a savings or import limited process disappears.[1] Instead there are more or less smoothly diminishing returns (in terms of increased output) to both increased savings and increased access to foreign exchange and complementarity between them. The possibility of factor substitution means that domestic fiscal-monetary policies designed to increase savings or investment or both can have a substantial impact on growth even if the initial characteristics of the economy are excess demand for foreign exchange and excess supply of labor. The achievement of this potential impact first demands that the government be willing and able to change the real exchange rate, however.

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[1]For a discussion of this point and a more complete explication of the relationship between the real exchange rate, the rate of return on capital, and relative demand for factors, see R. Nelson, *The Effective Exchange Rate, Employment, and Growth in a Foreign Exchange Constrained Economy*.

The apparent dominance of the foreign exchange constraint leads many analysts to play down the role of fiscal-monetary policy in an underdeveloped economy, save to warn against gross policy errors such as hyperinflation. Yet viewed as a complement to exchange rate policy, there would appear much more room for, and need for, active fiscal-monetary policy. The way fiscal-monetary policy is used will determine how effectively an economy exploits the possibilities created by its exchange rate policy. Put another way, the level of the effective exchange rate determines what fiscal and monetary policy can accomplish.

In discussing the potentialities of fiscal-monetary policy for achieving growth and employment objectives in Colombia, we are severely limited by major gaps of knowledge. Although the recent studies by Taylor and Bird contain a wealth of material concerning fiscal potential, there is no analysis of even remotely comparable detail of Colombian monetary institutions and the credit structure of the economy.[1] With respect to the question of the quantitative dimensions of the macroeconomic structure of the Colombian economy, we can only share Taylor's lament that at present we do not know the shape of the relevant functions, much less the parameter values, that we need to know for quantitative specification.[2] In these circumstances our discussion will have to proceed at a fairly high level of abstraction.

The first point we think needs stressing is that, given an effective exchange rate that would permit faster growth and higher employment rates, fiscal-monetary policy must be expansionary to take full advantage of the new room for maneuver. This conclusion may appear to be in conflict with orthodoxy. If so, we suspect that most of the differences in prescription relate to differences in policy context and time horizon. The standard prescription tends to relate to

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[1] M. Taylor and associates, *Fiscal Survey of Colombia*, Baltimore, Johns Hopkins University Press, 1965; and R. Bird, *Taxing for Development*, unpublished manuscript.

[2] L. Taylor, "Macroeconomics and Fiscal Policy in Colombia," unpublished manuscript.

a crisis situation where devaluation plus restriction of aggregate demand are to be substituted for quantitative restriction of imports in dealing with an excess demand for foreign exchange. In contrast the concern here is with a long run fiscal-monetary policy that is complementary to a policy of stability and gradual increase in the *real* exchange rate. In this circumstance the rate of utilization of domestic resources cannot be assumed to be fixed. If one of the purposes of a lower real exchange rate is to open the possibility to decreased unemployment, the objective will not be achieved unless fiscal-monetary policy is expansionary.

A second point to note is that the objective of increasing the investment rate dictates that expansionary policy be biased. Policies aimed at increasing investment -- expansionary credit policy, tax credits for investment, certain types of public investment -- will ultimately need to be pushed. In the absence of an increase in the private savings rate, policies that regulate consumption demand, such as an increase in the income or excise tax schedule, will need to be implemented. Both Taylor and Bird have commented on the low private marginal propensity to save and the low income elasticity of government revenues that have marked Colombia since the early 1960s. Both have accepted the low propensity to save as a fact of life that may be immutable and have concentrated their attention on the problem of increasing average and marginal tax rates. Their judgment may well be correct. Yet although we agree on the importance of increasing the public savings rate, we suspect it is risky to extrapolate private savings performance during the last six or seven years to what could be an entirely new era of incentives and capabilities.

In this connection it is important to recognize the changing importance of the savings of the corporate sector. Until the 1960s household savings exceeded net business savings. During this period net private savings (household plus business) were a very sizable proportion of gross private savings, in some years even exceeding depreciation allowances. The period since 1957 has seen the virtual stagnation of household savings -- the apparent marginal propensity to consume out of disposable income being greater then one. But at

the same time business retained earnings and depreciation allowances have grown extremely rapidly. By 1965 these were ten times household savings. Although the decline in the household savings rate is undoubtedly real enough -- reflecting a shift of price expectations in an environment that offers a small variety of financial assets -- part of the measured decrease reflects a change in the structure of the business sector. Profits that were formerly accounted largely as household income are increasingly being counted as business income as the modern sector grows in importance relative to the traditional sector. This is quite important in considering the likely course of gross saving, for it is our suspicion that the depreciation and dividend practices of the corporate sector in Colombia cause the gross business savings rate to rise significantly if the ratio of private investment to gross domestic product is increased. If this is the case, the presumption by Bird that an increase in the national savings rate will have to come largely from increased tax rates may not be fully justified.

This leads to a third requirement for fiscal-monetary policy. The present very high cost of financial intermediation should be reduced. This can be accomplished by encouraging the creation of new types of financial assets, reestablishing the guaranty connection between the banking system and the "street" market, and freeing the financial intermediaries from some of their obligations to purchase new public or quasi-public issues.

Compounding the evolution of "earmarked savings" in the Colombian economy, the last seven or eight years have been characterized by the earmarking of a large part of the potential credit supply to specified purposes. We refer not so much to the special banks and funds established for certain development purposes as to the consequences of the policy of responding to fiscal and exchange crisis by means of forced subscription of government debt by the banking system. In the absence of an appropriate exchange policy, such a control technique may have been necessary. It has resulted in a retardation of the growth of the capability of the financial sector to provide an adequate supply

of private indirect debt, however. There is no need for this policy to continue in anything like its present dimension.

The above remarks have related to the use of fiscal-monetary instruments in pursuing growth objectives. These instruments also have a stabilization function. We think it is important to underscore the potential importance of fiscal policy as a stabilization device, for Colombian policy makers have shown a predilection to rely on monetary controls. It is quite true that a much better understanding of short and medium run behavioral and structural relationships is needed if fiscal policy is to make an effective contribution in this field, but even our present ignorance is no real argument for the use of monetary rather than fiscal instruments. Our understanding of the quantitative effects of changes in the money supply, the spectrum of interest rates, or the flow and distribution of credit to the private sector is certainly no greater than our understanding of the effects of changes in fiscal instruments.[1]

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[1]Short run changes in the price level are not closely related to changes in the stock of money in Colombia. If the data for the first quarter of 1963 are ignored neither the equation

$$\dot{P}_t/P_t = \alpha + \beta\, \dot{M}_t/M_t + u_t$$

nor the equation

$$\dot{P}_t/P_t + \alpha + \beta\dot{M}_{t-1}/M_{t-1} + u_t$$

yield significant estimates for β either for yearly or quarterly data. The distributed lag model

$$\dot{P}_t/P_t = a + \beta_1\dot{M}_t/M_t + \beta_2\dot{M}_{t-1}/M_{t-1} + \beta_3\dot{M}_{t-2}/M_{t-2} + u_t$$

also fails to yield significant regression coefficients (for quarterly data). The goodness of fit of models designed to test multivariate hypotheses is equally unimpressive. Using quarterly data but ignoring the hyper-inflationary first quarter of 1963, the model

$$\dot{P}_t/P_t = a + b_1\dot{M}_t/M_t + b_2\dot{M}_{t-1}/M_{t-1} + b_3\dot{W}_t/W_t + b_4\dot{W}_{t-1}/W_{t-1} + u_t$$

explains almost none of the variation in the rate of growth of prices in Colombia since 1958.

A good part of the reason why the effects of changes in fiscal or monetary instruments in Colombia are so difficult to predict is the importance of the foreign exchange constraint. In the absence of chronic exchange disequilibrium there is good reason to believe that advantage can be taken of the potentialities of fiscal-monetary policy. For example, in his study of stabilization policy in Mexico, Koehler has provided some support for the belief that monetary policy in a less developed country has a powerful short run effect -- a point of view that in the absence of such a rationale seems out of tune with current thinking about monetary policy in more developed countries.[1] He has argued that in Mexico there is considerable excess demand for investable funds -- that investment is in fact credit limited at any time -- and that variation in lending will have a rapid short run impact on actual investment expenditure. The same arguments appear applicable to Colombia, although it also appears that the stabilizing force of monetary instruments will become less powerful if the structure of financial intermediaries becomes more complex and past trends in the growth of gross corporate savings continue.

Perhaps the most useful single addition to the Colombian government's portfolio of stabilization instruments would be the power to vary excise tax rates. Given the well-known problems of personal and business tax collection in less developed countries, and given the nature of the product classes where a variable excise tax would appear simple to administer, such a tax would appear a natural instrument for consumption demand regulation in Colombia. Colombia already has the administrative and legislative machinery and considerable experience with an excise tax system. The added complications of a variable excise tax system do not appear very serious.[2]

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[1] J. Koehler, *Economic Policy Making with Limited Information*, RM-5682-RC, Santa Monica, The RAND Corporation, May 1968.

[2] An excise tax would appear to have the virtues of predictability and rapidity in its effects. Taylor's work on Colombian consumption relationships suggests that the elasticity of real consumption demand with respect to an excise tax rate might well be close to one. His estimates of the time pattern of response indicates that the effect of

The availability of both a variable excise tax and the ability to tighten or ease credit would mean that the Colombian government would have a choice regarding which components of demand to expand or contract in the face of fluctuating demand and varying supply constraints. The option to restrain investment demand through monetary policy would remain of course to be used where appropriate. But the ability to cut back on consumption demand would also exist.

There is nothing very new in these observations. To the extent that Colombian fiscal-monetary policy has not been formulated as a response to short run foreign exchange crises, it has been considered in terms of very similar criteria both by the Colombian authorities and the international agencies. The problem is that fiscal-monetary policy has been dominated by the need to preserve foreign exchange reserves. This has been most unfortunate, because fiscal-monetary instruments are very inefficient means of controlling the excess demand for foreign exchange when the exchange disequilibrium has reached the proportions it has in Colombia. In particular, there has been much too much reliance placed on monetary techniques in attempting to deal with issues that are properly matters of foreign exchange policy.

The result has been the simultaneous frustration of both growth and stabilization objectives. The sensitivity of government revenues to the volume of trade and its insensitivity to income has implied -- in conjunction with a policy of fixed or sticky exchange rates -- a budgetary cycle that has exacerbated the already politically difficult problem of carrying out an orderly expansion of the money supply. The credit squeeze on the private sector has resulted in some damping of import demand, but it has also depressed the demand for domestic products and reduced the incentive and the ability to invest. The

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a change in excise tax rates is likely to be very rapid. See L. Taylor, *A Small Econometric Model of Colombia*, unpublished manuscript. The forthcoming study of household consumption by the Centro de Estudios Sobre Desarollo Economico of Los Andes University ought to provide a reasonably good basis for understanding the distributional effects of alternative excise tax structures.

conclusion is obvious. Fiscal-monetary policy cannot be used to pursue growth, employment, or stabilization objectives so long as foreign exchange policy is inadequate, for the objective of preserving foreign exchange reserves necessarily takes first priority.

This point is critical. The costs of an overvalued exchange rate and super protection of industry are far greater than is implied by the bland phrase "misallocation of resources." The ultimate cost is a depressed level of aggregate demand that cannot be elevated through conventional monetary-fiscal techniques. The "cannot" here results from the inconsistency of the objectives of maintaining foreign exchange reserves and promoting growth in the environment of the "disequilibrium" system of exchange controls. The Colombian government has made it very clear to the international agencies that it intends to retain complete control over foreign exchange policy decisions even if these decisions should result in a lessened flow of international lending. The point that the Colombian government must understand, however, is that a poor choice with respect to foreign exchange policy will ultimately destroy their freedom of choice with respect to fiscal-monetary instruments.

IV. FACTOR PRICES AND PRODUCTIVITY

THE PRECEDING CHAPTER suggested that a principal objective of Colombia policy should be to achieve and maintain a higher real exchange rate. The focus of attention in that discussion was on such policy instruments as the exchange rate structure, import licensing, and the tariff structure. There are many other variables that affect the real exchange rate, however. An increase in the nominal rate implies an equal increase in the real rate only if prices are stable. Speaking broadly, the rate of increase of prices of final products will be equal to the difference between the rate of increase of factor prices and the rate of increase of total factor productivity. In recent years the rapidity of price change has severely limited the effectiveness of the classical instruments of foreign exchange policy in achieving the ultimate objective of increasing Colombian exports and increasing the competitiveness of domestic substitutes for imported goods. The topic of this chapter is the determinants of two of these complicating variables -- domestic factor prices and productivity.

The first point to be considered is the rapid increase of wages in Colombia and the bifurcation of the Colombian wage structure. Although we conclude that the protected structure of industry is the most important factor behind wage trends, the effects of the labor code on labor market characteristics are not negligible, and we explore several possible changes in that code. We also briefly consider price control policy and conclude that, although existing control could be administered more effectively, the key to price-wage restraint is a toughening of government resolve not to isolate Colombian industry so completely from foreign competition.

The final two sections of this chapter discuss two important routes toward cost reduction -- routes that aim to increase total factor productivity. The first is education. We discuss the evolving understanding of the role of education in economic development and present some estimates of the rates of return to different levels and kinds of schooling in Bogota and the results of an interview study of skill shortages. Various implications for Colombian educational policy are suggested. In the final section of this chapter we consider an important but largely unexplored subject -- the role of indigenous research and development activities and technical information services in the modernization process. Focusing on the "brain-drain" that Colombia has been experiencing, we suggest that a positive technology policy is a necessary complement to Colombian investment in higher technical education.

Wages and Prices, the Labor Code, and the Question of an Incomes Policy

Wage and Price Trends

There are two related but separable phenomena regarding wages and other labor costs that require the explicit recognition and, where feasible, the policy response of policy makers in Colombia. The first is that the rate of increase in the average money wage rate of urban workers has consistently and significantly exceeded the growth of output per worker. The second is that the Colombian urban wage structure shows a strong trend of splitting into two parts, with high and rapidly rising wages in the modern subsectors and low and (at best) slowly increasing wages in the traditional subsectors.

Since 1958 the average yearly increase in wage rates and salaries has been nearly 15 percent. Although Table 9 shows considerable variation from year to year, yearly increases have been consistently above 10 percent. It is difficult to identify a labor productivity series that corresponds exactly to the wage and salary series, but it

Table 9

RATES OF INCREASE OF WAGES AND PRICES, 1958-1967

Year	Quarter	Percentage Increase of Salaries	Percentage Increase of Wages	Percentage Increase in the Cost of Living (workers)	Percentage Increase in Wholesale Prices Other than Foodstuffs
1958		13.9	8.6	7.9	16.4
	1	3.5	2.9	1.9	4.8
	2	4.6	1.9	4.4	5.4
	3	3.7	.9	.8	4.2
	4	1.4	2.7	.5	1.1
1959		8.9	11.4	7.7	6.9
	1	2.3	.9	3.1	1.0
	2	2.6	3.5	3.2	2.9
	3	1.3	3.4	.1	2.6
	4	2.5	3.3	1.2	.3
1960		8.6	11.1[a]	7.5	3.1
	1	2.7	.8	1.4	.5
	2	1.9	3.1[a]	2.0	1.3
	3	2.4	5.0[a]	.9	.5
	4	1.3	2.0	3.2	.7
1961		9.4	12.0	5.5	5.0
	1	2.0	1.3	2.7	2.6
	2	2.4	3.3	3.7	.8
	3	2.9	3.8	-2.3	.7
	4	1.8	3.1	1.3	.8
1962		12.6[a]	17.8[a]	6.1	7.4
	1	2.7[a]	2.4[a]	1.4	1.0
	2	3.3[a]	5.1[a]	1.3	1.7
	3	2.7	5.4	1.5	1.3
	4	3.2	4.2	1.7	3.2
1963		24.1	37.8	35.4	25.5
	1	12.7	24.9	16.7	17.1
	2	4.6	4.3	8.1	3.3
	3	1.8	2.4	2.0	2.2
	4	3.3	3.3	5.3	1.6
1964		11.2	11.3	8.5	6.7
	1	3.4	3.2	4.3	2.4
	2	4.1	2.2	7.9	1.2
	3	1.2	2.1	-3.7	1.9
	4	2.1	3.2	.1	1.1

Table 9, continued.

Year	Quarter	Percentage Increase of Salaries	Percentage Increase of Wages	Percentage Increase in the Cost of Living (workers)	Percentage Increase in Wholesale Prices Other than Foodstuffs
1965		14.4	12.8	14.3	18.2
	1	3.1	1.7	1.6	2.2
	2	5.2	2.8	4.8	3.1
	3	2.1	3.0	.8	6.8
	4	3.2	4.6	6.5	5.0
1966		12.7	11.6	12.7	13.7
	1	4.1	3.1	5.1	4.8
	2	4.7	3.7	4.3	2.9
	3	1.6	1.4	.4	3.3
	4	1.7	2.8	2.3	2.1
1967[b]		7.5	5.5	5.0	3.7
	1	2.8	2.5	2.0	1.6
	2	4.6	2.9	2.9	2.0

Notes:

[a]Adjusted for change in sample.

[b]Six-month figures only.

Source:

Departamento Administrativo de Estadistica, *Boletin Mensual*, Bogota, 1958-1967. Banco de la Republica, *Revista del Banco de la Republica*, Bogota, 1958-1967.

is highly unlikely that growth of output per worker over this period could have exceeded 4 percent a year. This means that either capital's share had to decline, or prices had to go up, or both. The national accounts data for the manufacturing sector indicate that the former did not happen. The last two columns of Table 9 show that the result has largely been that prices have risen, on the average and over the long run, by about the difference between growth of money wages and the growth of productivity.

This is not to blame wage hikes for price hikes, nor even to suggest a close empirical short run relationship between the two.[1] But

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[1] If the data for early 1963 are ignored it is not possible to establish any statistically significant relationship either between changes in the cost of living and changes in wages or between changes in wages and changes in the wholesale price index. With respect to the hypothesis that changes in the wholesale price index are a function of changes in the wage rate, neither the estimating equation

$$\dot{P}_t/P_t = a + b(\dot{W}_t/W_t) + u_t$$

nor the equation

$$\dot{P}_t/P_t = a + b(\dot{W}_{t-1}/W_{t-1}) + u_t$$

yields estimates for b that are significantly different from zero for any meaningful degree of confidence. The W in these and subsequent equations denotes average hourly earnings of "obreros" and the P denotes the wholesale price index excluding foodstuffs. This statement holds true both for quarterly and yearly observations. It also holds true where the data for any given quarter represent the average of the observations for that quarter and the three preceding quarters. Where the data are actual quarterly observations, none of the regression coefficients of the distributed lag model

$$\dot{P}_t/P_t = a + b_1\dot{W}_t/W_t + b_2\dot{W}_{t-1}/W_{t-1} + b_3\dot{W}_{t-2}/W_{t-2} + u_t$$

prove to be significant.

Where the hypothesized relationship is reversed, the statistical findings are equally unimpressive. If the data for the first quarter of 1963 are omitted, neither the equation

$$\dot{W}_t/W_t = a + b\dot{P}_t/P_{t-1} + u_t$$

nor the equation

over the long haul it is clear that the pace of money wage increases is incompatible with stable prices -- indeed, probably is incompatible with prices that rise less than 8 to 10 percent a year -- and there is no evidence of a striking reduction in the rate of wage increase. In turn, this means that in the absence of a continuous devaluation, the real exchange rate, once pegged, tends to erode until it is pegged up again at some future date. In short, the rapid rate of wage increase probably is the principal factor requiring the adoption of the flexible exchange policy (with an expectation of rate drift) that was discussed in the previous chapter.

The upward drift of average wages and salaries does not reflect a balanced expansion across the urban economy. Rather the drift has been highly uneven. Table 10 shows major differences among broadly defined urban sectors. The group of sectors where wage rates have been increasing rapidly roughly spans the modern portion of the economy -- modern manufacturing, government services, transportation, communications, finance, construction, mining. The low growth group covers most of the employment in traditional activities -- craft manufacturing, commerce, personal services (consisting largely of domestics). Relatedly, the sectors where wage rates grew rapidly tended

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$$\dot{W}_t/W_t = a + b\dot{P}_{t-1}/P_{t-1} + u_t$$

yields significant regression estimates, P in this case being the worker's cost of living index instead of the wholesale price index excluding foodstuffs. Again, this holds for yearly observations, quarterly observations, or quarterly data obtained as the average of the observations for the quarter and the three preceding quarters. Again, the distributed lag model

$$\dot{W}_t/W_t = a + b_1\dot{P}_t/P_t + b_2\dot{P}_{t-1}/P_{t-1} + b_3\dot{P}_{t-2}/P_{t-2} + u_t$$

does not yield significant regression coefficients or explain anything but a trivial portion of the variation in rate of the dependent variable. There does not appear to be any sort of complex relationship between the wage rate, the price level, and the money stock that could explain the lack of significance of the direct relationship between wages and prices. It should be noted that short run changes in the price level are not closely related to changes in the stock of money in Colombia.

Table 10

AVERAGE LABOR INCOME PER EMPLOYEE BY SECTOR, 1951 AND 1964

Sector	Wages and Social Benefits (millions of current pesos) 1951 (1)	Total Employees (thousands) 1951 (2)	Income per Employed Worker (thousands of current pesos) 1951 (3)	Wages and Social Benefits (millions of current pesos) 1964 (4)	Total Employees (thousands) 1964 (5)	Income per Employed Worker (thousands of current pesos) 1964 (6)	Ratio of Column (6) to Column (3) (7)
Mining	67.9	34.8	1.95	526.9	47.9	11.0	5.64
Modern manufacturing[a]	365.8	169.0	2.16	3283.9	272.5	12.1	5.60
Craft manufacturing[a]	118.0	89.4	1.32	642.0	159.0	4.04	3.06
Construction	161.0	106.0	1.52	1416.1	171.5	8.26	5.43
Public utilities	14.2	9.65	1.47	279.2	12.6	22.2	15.1
Commerce	185.7	57.9	3.21	1070.0	136.5	7.84	2.44
Finance	67.8	17.3	3.91	1000.7	53.2	18.8	4.81
Transportation	193.3	94.1	2.05	1390.8	128.3	10.8	5.27
Communication	22.4	7.01	3.20	234.6	15.1	15.5	4.84
Personal services	326.6	371.8	.878	1877.0	620.3	3.03	3.45
Government services	401.0	128.7	3.12	3025.7	201.0	15.1	4.84
Not otherwise classified	--	39.0	--	--	101.1	--	
Total nonagricultural sectors	1923.7	1124.7	1.71	14,747.1	1919.0	7.68	4.49

Note:

[a]Estimates for Craft manufacturing are our estimates. The employment figures are consistent with census estimates for all of manufacturing, but the labor income estimates are somewhat speculative.

Source:

Labor Income: Banco de la Republica, Bogota, *Cuentas Nacionales*, mimeographed. Employment: Departamento Nacional de Estadistica, unpublished data for 1951; and *XIII Censo Nacional de Poblacion, Resumen*.

to have a higher than average wage rate at the beginning of the period and the sectors where wages rose slowly began the period as low wage industries.

If we limit our attention to manufacturing industries, the impression of growing dualism of the wage structure is reinforced. Tables 11 and 12 show that in every industry, wage rates in the largest firms -- already relatively high in 1958 -- grew faster than wage rates in the smallest firms. More generally, the rate of wage increase was systematically related to firm size.

This breaking apart of the wage structure poses serious distributional and political problems. Such a pattern cannot help but retard the growth of output and employment in the modern sector unless fully compensated for by exchange rate changes that keep the real costs of labor from rising more rapidly than productivity. In particular, such a wage rate increase pattern interferes with Colombia's ability to develop export markets or compete with imports. Yet a policy of progressively increasing the exchange rate to keep pace with the rise in unit labor costs in the modern sector can cause, and undoubtedly has caused, serious hardships for those Colombian workers whose wage rates are low and not growing rapidly. Awareness of this has probably been a factor behind Colombia's reluctance to adopt a policy of progressive devaluation.

There is no question but that the trends in labor costs and wage patterns are causing Colombia some serious policy problems. This belief has led many observers to conclude that the necessary first step in controlling wage drift is the overhaul of Colombian labor legislation. We believe, in contrast, that the role of the labor code *per se* in generating the pernicious developments discussed above has been exaggerated and that changes in the code, although desirable, are certainly no panacea. Later we shall make some suggestions regarding what we think are desirable, and feasible, directions for change. But first it is worthwhile to outline briefly the evolution of Colombia's labor code and to examine its effects.

Table 11

CHANGES IN WAGES IN MANUFACTURING BY INDUSTRY AND SIZE OF FIRM, 1958-1964

Industry	Percentage Increase in Average Wages		
	Firms Employing Less Than 10 Workers	Firms Employing 100 Workers or More	All Firms
Food	72.8	199.8	180.4
Beverages	60.7	167.7	169.4
Tobacco	69.9	203.2	235.3
Textiles	141.7	173.2	169.1
Clothing	48.1	167.2	148.6
Wood	55.9	195.4	145.8
Furniture	57.7	178.0	116.9
Paper	115.2	196.4	200.6
Printing	63.8	159.1	149.0
Leather	129.8	138.2	140.7
Rubber	60.6	187.3	181.0
Chemicals	65.4	177.8	174.8
Oil and coal	101.1	150.4	142.7
Non-metallic minerals	64.6	184.5	180.8
Metals	66.0	85.0	100.1
Metal products	85.8	174.5	159.6
Non-electrical machinery	80.1	128.0	122.4
Electrical machinery	75.2	190.4	180.1
Transportation equipment	49.7	131.4	121.7
Miscellaneous industry	63.3	100.5	123.1
All manufacturing	74.7	165.7	163.2

Source:
DANE, unpublished data.

Table 12

CHANGES OF WAGE RATES IN MANUFACTURING BY SIZE OF FIRM, 1958-1964

Number of Workers per Firm	Proportion of the Labor Force in Modern Manufacturing		Average Wage (current pesos)		Percentage Increase in Average Wage
	1951	1964	1951	1964	
0-9	13.8	12.2	$2,430	$ 4,246	74.7
10-19	11.1	9.8	2,984	6,344	112.6
20-49	15.9	13.0	3,704	9,137	146.7
50-99	11.8	11.7	4,253	11,335	166.5
100+	47.4	53.3	5,897	15.669	165.7
All firms	100.00	100.00	$4,643	$12,221	163.2

Source:
DANE, unpublished data.

The Evolution of the Labor Code

There have been two strands in the development of an official policy toward labor contracts and the procedure whereby such contracts are negotiated. The original, and still important, strand is the paternalistic concept of the state as the sole creator and enforcer of fair labor standards -- the defender of the just rights of labor primarily against employers but also (and more recently) against labor unions. The second (and recently important) strand is the concept of the state as the guarantor of the rights of labor to form free associations and the umpire of the bargaining process between these associations and the employers of labor.

The paternalistic stand long has been, and still is, although in a somewhat revised form, the more important. The underlying economic model originally was that of competitive selling of labor and monopsonistic buying. More recently the model has been augmented to include the concept of closed labor unions and bilateral monopoly, which works against the bulk of the individual laborers and consumers. In either case market solutions are deemed unlikely to be in the interests of the "people." The paternalistic view is particularly evident in the concern of the basic labor decrees of 1948 and 1950 with the details of the labor contract rather than the practice and proceedings of collective bargaining for a contract.[1] The state is interposed between management and labor as the guarantor of the rights of the worker. The law not only sets standards, it prevents the worker from waiving those standards.

The most notable feature of this labor legislation is its pervasiveness and detail. We shall be concerned here only with that part of the labor code regulating wages and termination procedure. Wage regulation involves a set of minimum wages, the minimum varying by location and size (capitalization) of firm, and prescriptions for shift differentials, overtime, and Sunday or holiday premiums. In

[1] S. Wurfel, *Foreign Enterprise in Colombia*, Chapel Hill, University of North Carolina Press, 1965.

addition to the basic wage, the labor code guarantees the workers a severance pay credit, a transportation subsidy, a semiannual bonus (proportional to the basic wage), a family subsidy (for low income workers), a clothing allowance (also for low income workers), and vacation pay. In addition to these payments the worker receives certain payment guarantees in connection with occupational and non-occupational illness including maternity benefits, life insurance coverage, and, in some circumstances, pension rights. These guarantees are in addition to the benefits available to the worker through the Colombian Institute of Social Security. In 1966 these obligatory supplementary benefits ranged from 34 percent to 40 percent of the basic wage.[1]

Termination procedure recently has been prescribed in similar detail. During the sixty day probationary period a worker may be fired without cause and without indemnity payments. However, a worker retained beyond the initial probationary period may be fired without cause only upon payment of an indemnity that increases with the length of service of the employee. A worker with more than 10 years' service may seek reinstatement in his job rather than accept the indemnity unless misconduct is proved. Even for workers of less than ten years' service, the right to discharge without cause is limited by a legal proscription against collective dismissal without prior approval of the Ministry of Labor; what constitutes "collective dismissal" is not defined.

From the beginning, but increasingly as trade unionism has evolved in Colombia, there has been a tension between the state paternalistic philosophy and the interests of unions in having a freer hand for bargaining -- between the state as the protector of labor, and union in the same role. One of the primary issues within the labor movement has been whether or not to relax the detailed provision of the code to achieve more room for bargaining maneuver and attain greater bargaining strength.

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[1]Data provided by the Labor Attache, U.S. Embassy, Bogota.

The part of the code that deals with job security has been supported and reinforced by organized labor. The strength of the job termination law and the provision of judicial review of firings of long term employees discussed above are in large part the result of union pressure. Although labor has since changed its mind, a modified form of compulsory arbitration is also the result of union demands. Unions may request arbitration as an alternative to striking at any time in the bargaining process. The government may demand arbitration if a strike is prolonged more than forty days. Additional amendments reflecting the emerging objectives of labor collectives have strengthened union security by protecting union officers against dismissal, providing for automatic checkoff of dues, requiring non-union workers to pay union dues, and extending the terms of collective contracts to all workers in the bargaining unit.

This transformation of the labor code in terms of augmenting the bargaining strength of organized labor was most marked in the latter years of the Valencia administration.[1] With the coming to power of the Lleras Restrepo administration the government attitude toward the labor code has shifted back to a vigorous paternalism. In some respects these attitudes represent a break with the past, in that they stress the monopoly powers of certain labor groups. The *Llerista* view is classic, however, in the extent to which it portrays the government as the sole protector of the interests of the "working man" and in its tendency to view organized labor simply as one component of the laboring class. The more radical elements of the Liberal Party

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[1]The call for a general strike in January 1965 by the Major Colombian labor organizations, the *Union de Trabajadores de Colombia* (UTC) and the *Confederacion de Trabajadores de Colombia* (CTC), was abandoned only upon the appointment of a Special High-Level Commission whose recommendations were understood to embrace reform of the labor code in the direction of increasing union bargaining strength. The government's decision to placate organized labor resulted in Decree 2351 of 1965 and Decree 939 of 1966, the terms of which were briefly described above. The most important single characteristic of these changes is their concern for safeguarding the interests of unionized workers in the modern sectors of the economy rather than securing of a broader set of working class objectives. The essence of these changes is the affirmation of property rights in the jobs held by such workers.

are even more forthright in this respect. Lopez Michelsen has identified organized labor as the "oligarchs" of the labor force and has called on those workers employed in the modern sector to be willing to take a cut in income if it is necessary to secure increased total employment.

The labor law in Colombia is incredibly detailed compared with that, say, in the United States, but it is questionable that the code is a major factor behind the wage development patterns described earlier. It simply is not clear to what extent the labor code induces, or reinforces, the rapid rise in labor costs in the modern sector of Colombia. The code does, of course, set minimum wages. In part of the modern sector and in a variety of activities that in some sense are technologically transitional between the modern and traditional sectors the minimum wage serves as the base rate for the wage ladder of the firm. This role of the minimum wage is important. For example the increase in the minimum wage given by Law 1 of 1963 caused an increase in actual wages that was substantially greater than explicitly required by law, since many firms felt it necessary to shift their entire wage scale in accordance with the change in the minimum. In the traditional sectors the relationships between legal minima and actual wages has been and continues to be considerably looser; yet here, too, the minimum wage probably is important. The stickiness of the minimum wage since 1963 is undoubtedly an important element in the explanation of why money wages in the traditional and technologically transitional sectors appear to have been increasing at a lesser rate than the cost of living in recent years.

Yet it is easy to overplay the role of the minimum wage. Many small traditional firms evade it. And the increase in wages in the modern sector has significantly exceeded the increase in the minimum wage. It is this latter phenomena that has the greatest policy significance. In the modern sector it would appear that the monopolistic structure of most product markets in Colombia is more responsible for the rapid growth of wages than any particular section of the labor code. The possession of full or partial monopolies in selling that

permit higher costs to be passed on in the form of higher prices has made management relatively compliant in bargaining with union leadership. Part of the remedy must ultimately take the form of making Colombia a more open economy -- increasing the importance of export markets and cutting into the margin of surplus protection from imports that Colombian producers now possess.

Wage rates, of course, are far from the full story of labor costs in Colombia. Much of the belief that the code is responsible for the rapid rise in labor costs stems from the observation that the officially required fringe benefits and wage supplements amount to some 30 to 40 percent of the basic wage (depending on the size of the firm) and appear to be rising as a percentage. The code perhaps is a partial explanation for why nonwage benefits are so large a share of labor costs in Colombia. But the code cannot explain why wage supplements, both absolute and relative to the basic wage, significantly exceed code levels in the largest unionized firms, appearing to average about 60-70 percent of the basic wage.[1] These cases aside (and they are perhaps the most important ones) increases in the legally imposed wage supplements are equal increases in labor costs only to the extent that the "direct wage" is determined independently of the size of these supplements. That is simply not the case. The habit of paying a substantial portion of the total wage bill in the form of wage supplements reflects as much as anything else a desire to minimize the base upon which payroll taxes will be levied. The high proportion of wage supplements to the wage bill is thus more the result of a wage strategy acceptable to both unions and management -- neither of whom have any ambition to see a large increase in payroll taxes -- than a wage distortion induced by government policy.

Concern about the undesirable effects of the labor code with respect to labor costs and output and employment growth in the modern sector transcends the effects of the code on wage and supplementary

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[1] Data obtained by Slighton in the course of interviews with thirty-six manufacturing firms in Bogota, Cali, Medellin, and Barranquilla.

payments. It often is argued, and with reason, that the job security aspects of the code -- the costs of and prohibitions on worker layoffs -- raise both perceived and real labor costs to employers by making it more costly to adjust their work force to fluctuations in demand, and to fire unproductive tenure workers.

Although the argument makes sense *a priori*, there appears to be some diversity in the attitudes of firms toward the new severance law. Many firms declare that they have no trouble firing workers of less than ten years' tenure. They simply pay the *indemnizacion* -- or bargain with the worker over what portion of the *indemnizacion* shall be paid. It is difficult to tell whether such firms represent those who have "enlightened" labor relations -- firms that have managed to adjust their traditional views of patronal responsibility and privilege to encompass an acceptance of the union as the focus of contact between labor and management -- or firms that feel particularly able to shift increased labor costs to the consumer in the form of higher prices.[1] Other firms argue that the costs of varying the work force are prohibitive. Almost all firms complain of the virtual impossibility of firing workers who have more than ten years' experience. Most firms complain that they are unable to secure permission to fire workers in large numbers no matter how redundant the work force may be. There is some ambiguity in employer response to this issue of mass dismissals, however. Firms that are not unionized apparently have little trouble in reducing a work force that they consider redundant. Some unionized firms feel that there is no administrative or procedural problem in firing workers so long as they adhere to a fixed upper limit per month. Still others claim that they find it impossible to fire more than one worker per month. In short, the effect on labor costs and efficiency of the severance provisions of the labor code, although undoubtedly significant, are difficult to pin down in terms of magnitude. Like all interferences with managerial prerogatives, their real effects are usually overstated by business.

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[1]The question here involves both the elasticity of the demand curve facing the firm and the difficulty the firm may have in securing approval for higher prices from the *Superintendencia de Regulacion Economica*.

Finally, there undoubtedly are some unwanted effects caused by the pay differentials required for working hours other than the standard daytime shift. The triple pay for Sundays, and the night shift and night shift overtime supplement, provide a substantial cost penalty to firms whose production processes are continuous and are a barrier to a degree of capital utilization such as that achieved in the United States. We suspect that the main effect of these regulations is to discourage firms from exporting. Most firms whose markets are exclusively domestic appear to feel that such policy-induced labor costs can be shifted to consumers with little effect on profits.[1] Another important example is the prohibition in payment by a multi-location enterprise of different wage rates in different locations, regardless of relative labor supply conditions. More generally the code now precludes a firm from taking advantage of expecially plentiful labor conditions in certain areas.

Toward a Constructive Revision of Labor Code and Labor Policy

It is probable that the effect of the Colombian labor code in raising labor costs has been exaggerated. The outsider in particular must remember that the complexity and breadth of scope of the code reflects the paternalistic character of traditional employer-employee relationships much more than it does either the objectives of organized labor or any concept of statism. What may be viewed as intolerable by a Manchester liberal may appear quite rational to a Colombian traditionalist. The basic causes of sharply rising average wage rates and the splitting wage structure appear to reside elsewhere than in the labor code -- in particular, in the protected monopoly positions of Colombian industry.

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[1] Of some fifteen firms producing under terms of multi-shift production that were interviewed in the summer of 1968 only two indicated that the shift differential prevented or imperiled multi-shift operations. Five firms felt that they simply passed the added costs on to the customer; the remainder resented the added cost but indicated that it did not affect their operations.

This is not meant to imply that there are no particular advantages to be achieved in subjecting the labor code to a comprehensive overhaul. There are. One such set of changes was submitted by the Minister of Labor to the Tripartite Conference of August 1967.[1] Since these reforms were subsequently introduced as draft legislation before the Congress, we think it useful to consider potential policy reforms in reference to this specific set of proposals.

We believe that the proposed reforms should be evaluated according to the following criteria. Does the reform reduce labor costs or otherwise provide an incentive for exporters? Does the reform tend to reduce the pace at which the wage structure is splitting apart? Does it facilitate the possible implementation of policies designed to reduce the rate of average wage drift? Is the business community likely to view the proposed policy changes as semi-permanent? Is the reform likely to so alienate organized labor that it will become an active part of a political opposition dedicated to the obstruction of all policy changes proposed by the government?

A number of the proposed reforms deal with specific contract terms or labor practices. Some of these relate to layoff provisions. Included here are the proposed elimination of the right of a worker with ten or more years' seniority to seek reinstatement in his job through the labor courts and the specification of what is meant by "collective dismissal" to eliminate obvious uncertainties in the meaning of the code. Other proposals would revise pay differentials for work shifts and shorten the time that must elapse before the government may unilaterally intervene in a labor dispute. There is little question in our minds that these reforms are basically desirable. Organized labor can be expected to oppose each of them, but since none of these proposals cuts very deeply into the right of unions to organize

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[1]The reform proposals discussed here represent an abridgment of the proposals contained in the government's working paper dated 10 August 1967. This paper apparently reflected the thinking of both President Lleras and Labor Minister Noriega.

and bargain collectively, it can be hoped that much of the opposition will be opposition in principle or for bargaining purposes. The government's authority to order compulsory arbitration of labor disputes is clearly an abridgment of the right to strike, but the point at question is not the principle but the mechanics of its abridgment. Since strike funds are still quite limited in Colombia, there is some incentive for the unions to accept this proposal.

A second set of proposals is concerned with the establishment of special incentives for the hiring of new workers in two special areas -- the export industries and semi-rural or rural locations. For new firms established primarily for export purposes or located outside urban areas, the incentive that the proposed legislation seeks to create is threefold: the firm would be allowed to hire workers under temporary labor contracts; the employer would not be obliged to bargain collectively over wage rates during the first five years of the existence of such a firm; unions would not be constituted in such firms except with the support of more than half of the total number of employees. Existing firms that export most of their production would be granted only the first two privileges.

These reforms, too, seem generally desirable. There are several questions, however, over the advisability of the specific content of the incentive package. The critical element is the possibility of hiring under temporary labor contracts. This privilege would eliminate those critical uncertainties about management's ability to reduce an excess work force that contribute so much to the view that labor is a fixed cost. On the other hand, the elimination of the exporter's or rural employer's responsibility to bargain collectively over wage terms is likely to be viewed as a gratuitous slap at the traditional rights of organized labor. It is also probably unenforceable. If, as appears virtually certain, the cost of living continues to climb, the workers are certain to demand some form of wage readjustment. The fact that this demand would be illegal -- or disguised -- is irrelevant. What is important is that Colombian management will not believe that a guarantee of fixed wages over a five year period is likely to

be enforced. As an incentive it is empty. As an irritant it is a live issue.

Perhaps the most important set of proposed changes aims to modify significantly the nature of the bargaining process between unions and management. One of these proposals is the redefinition of the term "unified enterprise." Under the current law the wages paid by any juridical person must be the same for the same job no matter what the location of the work being performed. Most employers claim that this prevents them from taking advantage of surplus labor pools in semi-rural areas or smaller cities. Other proposals affecting the labor-management relationship in a general way are the proscription of organized labor's use of professional negotiators (representatives other than employees) in the conciliation phase of a labor dispute, and the specification of agricultural activities, including processing of agricultural products, as public services and thus not subject to strike.

The revision of the definition of the term "unified business enterprise" may well be the farthest reaching of any of the proposals in the government's reform package. As the law is currently interpreted, it is very difficult to establish the legal argument that the branch operations of a given firm are located in areas of dissimilar economic conditions and hence should be allowed to negotiate separate wage agreements. If the draft legislation were accepted, economic conditions in areas of low population density could not be construed as being similar to those in areas of high population density; and economic conditions in departmental capitals could not be construed as being similar to those in other municipalities.[1] The charge will inevitably be raised that this proposal would destroy "industrial" unionism if adopted. That is an exaggeration, although it is quite true that adoption of the government's proposal would eliminate one of

[1]According to the original government proposal, similar economic conditions could not be presumed to exist between areas of population density of less than 30 inhabitants per square kilometer and more than 30.

the most important of the protectionist devices that urban labor has used to insulate local labor markets from the national labor market. The official argument for this proposal is stated in terms of the necessity to encourage the decentralization of industry, but there is much more at stake than that. The point of this proposal is not to alleviate the problem of underemployment in rural areas -- an excessive ambition when the quality demanded of an industrial labor force is considered -- but to permit Colombian industry to take more advantage of whatever cost differentials are implied by local variation in labor market characteristics. Organized labor in Colombia has developed into something akin to a noncompeting group, and a large part of wages in industry consists of monopoly rents. The question of how to deal with this problem without mounting a frontal assault on the rights of workers to organize and bargain collectively is extremely touchy. Opening up of the metropolitan unions to the threat of competition from the labor of the smaller departmental towns is a constructive start.

Our suspicion is that the restriction on union use of persons other than employees as bargaining representatives denies too much of union history in Colombia to be in the slightest degree acceptable to organized labor. There is also the question of whether the resource allocation effects of this proposal are desirable. The presence of professional negotiators in union ranks has been the source of much of the pressure for professionalizing management in Colombian industry. The advantages of attempting to proscribe strikes in agriculture and in those industries concerned with the processing of agricultural products also seem to be of doubtful value when compared with the likely costs of attempting to do so. The history of the labor movement in Colombia gives ample evidence that the fact of illegality is a weak deterrent to the will to strike. In recent years the government's labor policy has stretched the concept of an industry in the "public service" completely out of recognition. There is little reason to further the abuse. The inclusion of this recommendation in the proposed set of reforms achieves very little besides adding to organized labor's conviction that in seeking this reform the government is acting as management's proxy rather than attempting to secure the principle

of the primacy of public interest as a whole over the interests of either management or labor.

The Evolution of a Price Control and Income Policy

Although the Colombian government has not made a particularly strong effort to control prices indirectly through a wage policy, there is substantial experience with attempts at direct control of prices. Until recently, price control legislation was aimed specifically at items important to the cost of living of the working class.[1] Through time, however, the mandate accorded to the price control authorities has expanded to embrace both final products and goods that are inputs for final products that are of importance to consumers of virtually all income classes.[2] The basic authority for price control rests with the Superintendencia de Regulacion Economica (SRE). Responsibility for regulation of the prices of unprocessed agricultural commodities is vested in a separate organization (INA). The policies of the SRE will be the subject of this discussion.

In principle at least many of the commodities manufactured in Colombia are subject to price control. According to current administrative practice, prices are to be set so as to guarantee cost. In general, only one price increase per year is permitted. About three months is usually required to process a request for price change. Even though it was subjected to an extensive reorganization in 1965, the SRE is severely limited both in quantity and quality of personnel. The bulk of the actual enforcement of price control decrees consequently appears to derive from the activities of municipal authorities,

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[1] Prices of goods of "prime necessity" were first regulated under the authority of Law 7 of 1943.

[2] Over the years the concept of prime necessity expanded to include (monopoly) prices controlled by the producer (Law 155 of 1959), inputs into the production of items of prime necessity (Decree 2709 of 1962), and items of prime necessity (and their inputs) to the middle class (Decree 102 of 1967). The "prime necessity" concept produces certain regulator anomalies. For example, the standard safety razor blade produced by the local subsidiary of the Gillette Company is price controlled; the more expensive stainless steel blades are not.

the police, and various citizen groups. It is not surprising therefore that an independent study by the Departamento Administrativo de Planeacion (DAP) revealed that compliance with price controls was highest among the poorer neighborhoods and more common for final products than for intermediate goods.[1] There is virtually no control over the quality of goods sold under a given nomenclature, and delay in granting authority for price increases appears to breed an increasing lack of compliance with the posted price.[2]

The difficulties of the SRE in enforcing official price policy should not be surprising. The problems of administering a detailed price control system have seriously strained the governmental apparatus even of countries as well endowed with administrative resources as the United States. This is not to say that public regulation of public utility rates and of the prices charged by a few key monopolized industries is either impossible or undesirable. But a comprehensive and efficient price control system covering large congeries of products is beyond Colombia's administrative reach. Up to now her efforts in the price control arena have been more in the nature of forays than systematic policy. In refusing to grant automatic price increases to cover increased costs of imported intermediate goods, the SRE has had some success in delaying or spreading out the inflationary consequences of devaluation.[3] But policy has too often been shaped by political expediency and has thus taken on the flavor of punitive rather than regulatory action.

There are a number of avenues for possible improvement of the effectiveness of price control administration. The key to any success, however, appears to reside in the willingness of the SRE to restrict

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[1] According to the DAP study, of 23 classes of goods examined the average actual price exceeded the legal price in 17 classes.

[2] Because it is an element in so many prices the allowed price on trucking services was not changed between 1965 and the time of the DAP survey (winter of 1967-1968). By that time there was virtually no compliance with the posted price.

[3] This was particularly true during the gradual devaluation of 1965-1966.

its ambitions. Rather than attempting to control consumer prices generally, the regulatory authority should focus on a set of limited objectives: coordinating price control with government efforts toward influencing wage bargains through arbitration proceedings; and regulating prices of goods that are sold under conditions of substantial seller's monopoly where the threat of competition from imports is not or cannot be effective. A concurrent overhaul of the specific regulatory criteria is also needed. The system of "cost-plus" pricing has no justification other than administrative convenience. Since the regulatory burden is now such as to virtually compel SRE examiners to accept cost data submitted by the petitioning firms, even this advantage is spurious. The cost-plus criterion does not provide producers with an incentive to resist union wage demands. It has the unfortunate consequence of implying a profit rate that varies inversely with the degree of fabrication carried out within the firm. It should be abandoned, but it is doubtful that it will be abandoned so long as the SRE retains direct responsibility for the prices of thousands of commodities.

The potential advantages that might derive from the coordination of price control and wage policies appear to be particularly important. The Lleras administraton has shown a surprising degree of initiative in intervening in wage negotiations. In doing so it has used all of the weapons at its command: Article 430 of the Labor Code in establishing the illegality of strikes in public services -- although the opposition of the advisory Council of State induced the labor ministry to desist from this in the Coltobacco strike; the 40 day compulsory arbitration clause (coltobacco and Coltejer); and vigorous prosecution of the arbitration role assigned to the government by the Labor Code. The Ministry of Labor's budget for arbitration has been tripled, and the number of arbitration panels established in the first year of the Lleras regime was some four to five times as high as in the last year of the Valencia administration.

The linkage of wage arbitration and price control policies provides the key to a future incomes policy for Colombia. The major

theme of such a policy should be the weakening of the conviction of both management and labor that increases in wage costs can be passed on to the consumer through price increases. To some extent the model for such a policy was established in the *Acerias de Paz del Rio* wage negotiation of 1967 in which the management was informed that the government would not allow price increases to recover profits eroded by the wage settlement. By providing the government with both a carrot and a stick to stiffen management's backbone, vigorous wage and price guidelines policy could do much here to provide a somewhat lower autonomous trend in wages and prices. The guidelines should not be presented in terms of a fixed target, however. The targets in individual settlements should be set in consideration of the recent wage-price history of the firm, the firm's monopoly position, the relationship between the wage scale of the firm and the wage scale characteristic of the market from which the firm draws its labor, the profit position of the firm, and the firm's export performance.

The issue of whether labor's share in these industries is too low and ought to be increased is likely to be politically sticky. We believe, however, that if the concern of government is with income distribution more broadly defined, this is not a particularly important question. Both profits and wages in those industries already are high by national standards, the former unnecessarily high for stimulating investing, the latter inefficiently high in that they perpetuate dualism. The most fruitful objective of an incomes policy is the delaying of both wage and price increases in those industries where both product and labor are sold under conditions of monopoly.

The notion that anything other than a very selective policy can be used effectively -- that Colombia can develop and administer a *comprehensive* incomes policy -- seems to us out of the question. In none of the Western European countries that have tried to administer such a policy in the post-World War II era can the policy be judged totally successful; in most of them it must be and has been judged a failure.[1] The administrative problems appear to be formidable,

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[1]For a general survey see U.N. Economic Commission for Europe,

requiring, in addition to sophisticated administrative capability, a strong national consensus and effective coalition among the major interest groups and their components. In the Netherlands (which would appear as having most of the above requirements) the postwar government was invested with the power to determine wages, working conditions, and prices in the interests of national objectives, which included moderating the income distribution, rapid growth, and sufficient price stability to maintain balance of payments equilibrium without devaluation. It is far from clear what effect, if any, incomes policy has had on income distribution. Although wages have tended to increase by more than sanctioned rates (set initially by national productivity trends, later by sectoral productivity growth rates) and prices have drifted upwards, it is probable that incomes policy has had some success in terms of growth and price objectives. Labor unions have cooperated in holding down wage drift, and even have accepted wage cuts when balance of payments crises threatened. Netherlands growth experience has been reasonably good, unemployment has been low, and (except for following the pound in 1949) devaluation has not been necessary. The last few years have generated growing tension with the policy. When the labor market became unusually taut in 1963 and inflationary trends were emerging elsewhere in Europe, the wage control scheme collapsed and decisionmaking power shifted downward from the government mediators, who attempted to follow the recommendations of the Central Planning Bureau, to the Labor Foundation and management groups. Thus, even in a highly favorable environment for the implementation of incomes policy, disciplined adherence to national policy priorities was able to hold down wage-price drift only so long as the market was approximately in equilibrium.

The experience of the United Kingdom is, unfortunately, much more relevant to the Colombian scene. Even though it had the supposed advantage of being used by a Labor government, the British incomes policy

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Incomes in Postwar Europe, Geneva, 1967. For a detailed study of the experience in the United Kingdom see D. Smith, "Incomes Policy," in R. Caves, ed., *The British Economy: Performance and Prospects*, Washington, D.C., The Brookings Institution, 1968.

has not prevented wage and price drift, has not enabled the nation to avoid devaluation, has tended to erode whatever cohesion on incomes restraint there was initially, and has contributed to falling away of the support of the government.

The administrative power and perceived harmony of economic interest in Colombia certainly is less than in the United Kingdom. Colombia has neither the administrative machinery to regulate price and wage increases systematically and effectively nor the strong centralized interest groups that would promote an effective coalition of labor and management. Aside from the selective price-wage policy discussed earlier, Colombia cannot expect to have success with a "direct" incomes policy.

It appears then, that such controls will not be able to relieve exchange rate adjustment of much of the burden of keeping Colombian prices competitive internationally (although they can perhaps restrain outrageous instances of duality in the wage structure). Domestic factor and product prices can be operated on indirectly, however. In particular, Colombia would probably find that the selective removal of foreign trade protection from sectors under inflationary pressures is a powerful instrument for curtailing wage-price increases. It is hardly surprising, given the openness of most West European economies, that the export prices of those countries have increased far less than the general domestic level since 1950. Another indirect policy approach to the same problem stresses improvements in the functioning of the labor market. Educational reforms can bring the skill composition of labor supply into better balance with labor demand. Active manpower policies might work to unify rural-town-metropolitan labor markets and erode the disparities between wages for comparable skills in the protected modern industrial sectors and the traditional sectors of the economy.

Our conclusions about reforms of the labor code and of the development of a more explicit and effective price-wage or incomes policy are that there are some gains to be made. We think the key, however, is a more open economy. Colombian businessmen must be given far greater incentive, and pressure, to keep prices and costs from creeping

up. The policies discussed in the preceding chapter are designed to work on the effective exchange rate from both sides -- both on the nominal exchange rate and on domestic prices. A more explicit wage and price policy can assist, but it cannot carry the major burden.

Education

The Role of Education in the Modernization Process

Knowledge about the role of education in the economic development process is both strong and weak. It is strong in that there are a number of significant empirical relationships that seem to hold. It is weak in that, although these relationships correspond to common sense, very little in the way of formal theoretical work has been done that really explains these relationships.

The relationships between level of per capita GNP and various measures of educational attainment on the part of the population are both striking and well known.[1] It is clear that the causality runs from high incomes to ability to support a high level of education, as well as from high educational attainment to high output per worker; thus these data alone tell little about the productivity of education as an investment in economic growth. It perhaps is significant, however, that several of the most rapidly developing countries in terms of per capita output -- Japan, Taiwan, Israel, South Korea -- have education levels above the average for countries with comparable per capita income. This suggests that not only is there some tendency for a certain national level (or distribution) of education to be associated with a given level of productivity, but that educating the work force above that level pulls up productivity.

Several studies provide further support for a relationship that runs from educational attainments to productivity. Mitchell has

[1] See, for example, the data presented by F. Harbison and C. Myers, *Education, Manpower and Economic Growth*, New York, McGraw-Hill Book Company, 1964.

found, through indirect techniques, that a considerable portion of productivity differences in an industry across countries can be explained by differences in the percent of skilled workers to total work force.[1] Mitchell and Keesing have provided evidence that, although there are differences across countries in the level of skills in any given industry, there is a systematic pattern that holds for almost all countries across industries.[2] The same industries stand relatively high or low with respect to the education requirement of the work force and (relatedly) average wage levels. Further, the industries that stand high on output per worker tend to be industries that utilize relatively large numbers of highly educated workers. Countries that have high per capita income tend to have both higher levels of educational attainment and higher productivity in all industries and a larger fraction of the work force in industries with relatively high education levels and productivity. Finally, there is the evidence that, in all countries for which data have been analyzed, wage rates are systematically related to years of educational attainment. Data for Bogota will be presented subsequently.

Despite the strength of these empirical relationships, rigorous understanding of just how education contributes to effectiveness on a job, or to the range of jobs a worker can handle with at least minimal effectiveness, is very weak. Formal analysis of the effect of the supply of people with various educational backgrounds tends to vacillate between assuming fixed educational requirements for a job and assuming that a better educated worker is a perfect (but more productive) substitute for a less educated worker. Mitchell's study, which posits diminishing marginal productivity to the number of people with skills above some minimal requirement, is an important formal step forward, but does not really come to grips with the mechanisms relating education to productivity.

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[1] E. Mitchell, *An Econometric Study of International and Inter-industrial Differences in Labor Productivity*, RM-5125-PR, Santa Monica, The RAND Corporation, 1966.

[2] D. Keesing, "Labor Skills and International Trade," *Review of Economics and Statistics*, Vol. XLVII, No. 3, August 1965.

Becker has provided an important clue.[1] As mentioned earlier, the training programs for a variety of jobs have been designed so that they can build on a base provided by the formal educational system. The more the new worker brings to his job, the less the time and expense involved in training him up to a given level of proficiency. The resulting implication is that formal education is a substitute both for experience and employer-provided training, in securing a given level of worker proficiency in a job. Or, given a cost constraint, educational attainments of the work force act as a limit on pace of expansion of employment in an activity, the limit being greater or less depending on the fraction of jobs that require special skills and the amount of combined education and experience needed to achieve minimum acceptable skill levels.

Several studies enrich and reinforce this point of view. In advanced countries one finds a strong relationship between the pace at which technology is changing in an industry and the education levels (particularly the percent of highly educated people) in the work force.[2] Where jobs do not change, the costs to an employer of training a relatively poorly educated worker or letting him gain experience on the job need be incurred only once. Where technology, and hence the nature of jobs, changes often, trainability for a variety of jobs becomes pivotal and the advantages of a strong education base on the part of a worker can be very important. An examination of the range of different situations with which so-called professionals -- doctors, engineers, economists -- have to cope on their jobs gives added support to this interpretation of the kinds of jobs that tend to be associated with intensive formal education.

In contrast, the ability to learn to cope efficiently with a wide variety of circumstances, any one of which may require some considerable skill or understanding, has limited payoff when the world is relatively

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[1] G. Becker, *Human Capital*, New York, National Bureau of Economic Research, 1964.

[2] D. Keesing, "Impact of Research and Development on U.S. Trade," *Journal of Political Economy*, Vol. 75, No. 1, February 1967.

static. Perhaps this explains why, although certain high skills are needed in craft technology, these tend to be taught on the job and the demand for people with formal high education is limited. It points, also, to the reason why education, at all levels, may be especially important in economies beginning to modernize rapidly. Craft managerial experience may have little relevance to making sensible entrepreneurial choices regarding whether to adopt what kind of modern technology, or how to run the operation once started. Although education may be a less than fully adequate substitute for relevant managerial experience, formal classes in various areas of engineering and management are designed to give a person a knowledge base for decisionmaking regarding modern technology. For technical jobs, when a machine in a new modern factory breaks down, formal training in the relevant sciences and engineering area may be more relevant to being able to find out why and take the appropriate steps than familiarity with quite different craft experience. At all of these levels experience in addition to formal education certainly helps, and often can substitute for formal education to some extent. But in a country just beginning to modernize, relevant experience is scarce. The less developed countries are in the peculiar position of being forced to substitute education for experience if they are to expand their modern sector rapidly and efficiently.

In most development models the manufacturing sector is faced with an elastic supply of labor. However, the model does not distinguish between kinds of labor. The performance of a country's educational system may be a key factor in determining the elasticity of supply of effective labor. If the supply of relatively well educated people at all levels is limited, rapid expansion of employment may rapidly lead to high costs. With a better educated work force, the lower levels of average experience associated with rapid expansion of employment may carry less penalty. A modernizing economy that opts for the hothouse environment of protection may be able to live with high costs. The Colombian experience suggests, however, that if rapid growth of output and employment is the objective, and the balance of payments is an important constraint, this is not a viable long run

strategy. For an economy that opts for openness and an export market, educational policy may be the key to making that strategy work.

For a variety of reasons we do not feel qualified to present detailed suggestions or normative judgments regarding the direction of Colombian educational policy, and given the number of groups now examining and making recommendations, there are strong reasons for our not doing so.[1] However, we believe we are able to contribute to the policy dialogue some information that may be useful. First, we have estimates, based on a population sample, of the rates of return to different kinds and levels of education in Bogota as of 1965. Second, from a detailed interview survey of Colombian business firms, we are able to shed further light on the evolving structure of demand and supply for different kinds and levels of skills.

Estimated Rate of Return to Education in Bogota, 1965

One may view the resources spent on education as an investment in the future productive capacity of people. In principle, the rate of return earned on resources in education can be computed in two ways, both of which are relevant to the formulation of national educational policy. A private rate of return deals only with the costs borne and benefits received by private individuals or families. The social rate of return broadens the scope of inquiry to include public resources injected into the educational process and social benefits that are not captured by private individuals. The first set of estimates that will be derived are of the private rates of return. Then estimates will be presented of a "partial" social rate of return -- partial in the sense that although crude estimates of public cost have been added to private cost, no adjustment of private income benefits has been made.[2]

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[1] The results of a comprehensive study of higher education in Colombia carried out by a team from the University of California is presented by G. Feliz, *Recommendations for the Development of Higher Education in Colombia,* Colombian Higher Education Project, 1967 (mimeo.).

[2] For a detailed discussion, see T. P. Schultz, *Returns to Education in Bogota, Colombia,* RM-5645-RC/AID, Santa Monica, The RAND Corporation, November 1968.

Age-earnings profiles for both men and women with various educational attainments were estimated from a household labor force survey of Bogota conducted in September 1965 by the Centro de Estudio Sobre Desarollo Economico (CEDE) of the University of the Andes. A sample of 684 men and 316 women (10 years old or over) was selected, and regression estimation techniques were used to derive hourly earnings profiles for men and women by age and schooling.[1] The estimated adjusted hourly wage profiles are shown in Tables 13 and 14. In the case of men with vocational education and women with no secondary or vocational education, no statistically significant association was found between years of schooling and earnings. Demand for domestic servants and other unskilled female labor in Bogota appears to place little market value on the years of primary school attended by a woman, though secondary and vocational schooling for women are significantly associated with increased earnings. The group of men with vocational training was very small, and although the coefficient was of reasonable magnitude the estimate of the returns to male vocational education should be interpreted with extreme caution.

Costs to a private student include both direct costs associated with attending school and opportunity costs associated with earnings forgone by the student while attending school rather than working. Direct private costs of schooling in Colombia are derived from a study of Guillermo Franco that was based on a sample survey of 2,680 family units collected throughout Colombia in 1961-1962.[2] The private opportunity costs are estimated from the adjusted wage profiles shown in

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[1]The dependent variable in the linear regression analysis was the logarithm of the hourly earnings adjusted for underemployment and domestic servants' receipt of income in kind. The adjustment procedure is important only with regard to women since 26 percent of the female labor force are resident domestic servants. Seven age cohorts and five educational levels are distinguished by means of dummy variables without allowance for interactive terms. The educational and age dummies were highly significant in all cases where the cells were of reasonable size except for primary education for women.

[2]G. Franco C., *Rendimiento de la Inversion en Educacion en Colombia,* Bogota, CEDE, 1964.

Table 13

ESTIMATED ADJUSTED MALE WAGE
BY AGE AND SCHOOLING, BOGOTA, SEPTEMBER 1965
(pesos per hour)

Synthetic Graduate by Education Type (and years of schooling)	Age Cohort						
	Less than 20	20-24	25-34	35-44	45-59	55-64	65 or more
None (0)	.21	.64	1.33	1.75	1.43	.91	.92
Primary (5)	.36	1.10	2.29	3.02	2.46	1.56	1.58
Secondary (11)	1.23	3.77	7.82	10.33	8.41	5.33	5.40
University (16)	2.31	7.09	14.70	19.41	15.81	10.02	10.15
Vocational[a] (8)	.51	1.55	3.21	4.24	3.45	2.19	2.22

Note:

[a]Interpret with particular caution for the regression coefficient is not statistically significant for this small group in the sample.

Source:

T. P. Schultz, *Returns to Education in Bogota, Colombia,* RM-5645-RC/AID, Santa Monica, The RAND Corporation, November 1968, Table 4.

Table 14

ESTIMATED ADJUSTED FEMALE WAGES
BY AGE AND SCHOOLING, BOGOTA, SEPTEMBER 1965
(pesos per hour)

Synthetic Graduate by Education Type (and years of schooling)	Age Cohort						
	Less than 20	20-24	25-34	35-44	45-54	55-64	65 or more
None (0) / Primary (5)	.48	.74	1.18	1.21	1.26	1.07	1.23
Secondary (11)	1.15	1.75	2.80	2.87	3.00	2.54	2.92
University (16)	4.63	7.06	11.28	11.57	12.09	10.26	11.78
Vocational (8)	.96	1.46	2.34	2.40	2.50	2.13	2.44

Source:
T. P. Schultz, *Returns to Education in Bogota, Colombia,* RM-5645-RC/AID, Santa Monica, The RAND Corporation, November 1968, Table 5.

Tables 13 and 14. The estimated components of the private costs of schooling in Colombia are shown in Table 15.

Using these costs and wage profiles, private rates of return are computed that equate the discounted value of these costs and implied benefits of future earnings to zero. Table 16 shows these rates of return for men and women on the basis of hourly adjusted wages with two alternative sets of opportunity cost estimates (on the high and low side) to determine the sensitivity of the estimates to possible error in our assumptions that young children not in school do not work and adolescents do not hold part time employment while continuing their studies.

The general ranking of the rates of return are not particularly sensitive to different assumptions as to level of opportunity costs. For men, primary school yields 17 to 18 percent return, secondary school yields 29 to 38 percent, vocational training yields about 50 percent, and university yields 4 to 5 percent rate of return on costs. For women, secondary school yields 14 to 21 percent, vocational education 42 to 64 percent, and university studies 5 to 6 percent rate of return on costs. These estimates imply that there are large payoffs to secondary and vocational schooling for both men and women, and relatively small ones to university studies. Primary schooling is also remunerative to men, but given the peculiar nature of the labor market for women's skills, primary schooling for women is rewarded only if they continue into secondary or vocational school which require a primary certificate for entry. The large increases in earnings associated with vocational training for women deserve further investigation, but the sample analyzed here is too small to distinguish among the various types of vocational education combined under this category.

In addition to the costs of education borne by the private individual, there are substantial public costs involved of which an adequate accounting is not now possible. Table 17 presents the budgeted expenditures for education at the Central and Department (state) government levels for Colombia in 1962. The operating expenditures are divided into three levels for which estimates of enrollment are

Table 15

ESTIMATED PRIVATE COSTS OF SCHOOLING IN BOGOTA
(in pesos of September 1965)

Years of Schooling	Assumed Age	Direct Costs		Opportunity Costs		Total Costs of Schooling	
		Male	Female	Male	Female	Male	Female
Primary							
1	9	633	536	-	-	633	536
2	10	689	616	-	-	689	616
3	11	750	708	-	-	750	708
4	12	816	815	-	-	816	813
5	13	888	934	-	-	888	934
Secondary (both courses)							
1	14	954	1016	442	887	1396	1903
2	15	1025	1105	553	968	1578	2073
3	16	1101	1202	691	1056	1792	2258
4	17	1181	1305	864	1152	2045	2457
5	18	1286	1372	1080	1256	2366	2628
6	19	1400	1443	1350	1370	2750	2813
University							
1	20	1524	1517	2759	2506	4283	4023
2	21	1659	1595	4567	3280	6223	4875
3	22	1804	1677	5856	4200	7660	5877
4	23	1964	1763	6298	4404	8262	6167
5	24	2138	1854	6777	4618	8915	6472
Vocational							
1	14	1510	1432	2759	2506	4269	3938
2	15	1707	1620	4567	3280	6274	4900
3	16	1903	1811	5856	4200	7759	6011

Note:
- It is assumed that no opportunity costs are associated with primary school attendance.

Source:
T. P. Schultz, *Returns to Education in Bogota, Colombia,* RM-5645-RC/AID, Santa Monica, The RAND Corporation, November 1968, Table 6.

Table 16

PRIVATE INTERNAL RATES OF RETURN TO SCHOOLING IN BOGOTA, 1965

	Primary Over No Schooling	Secondary Over Primary	Vocational Over Primary	University Over Secondary
Men				
Adjusted wage basis	18.4	34.3	52.5	4.4
High opportunity costs[a]	16.7	28.8	42.8	3.6
Low opportunity costs[b]	18.4	38.3	59.1	5.2
Women				
Adjusted wage basis	c	16.0	54.7	5.1
High opportunity costs[a]	c	13.6	41.6	4.6
Low opportunity costs[b]	c	21.1	63.8	6.2

Notes:

[a]Opportunity costs for primary education assumed to rise from 100 pesos per year at age 9 to 200 pesos per year at age 13. Opportunity costs for Secondary, University, and Vocational education are double those in Table 15.

[b]Opportunity costs for all levels of education assumed to be one-half those in Table 15.

[c]No association observed between years of primary school completed and women's earnings. Consequently, with some costs involved in primary education and no benefits, the implied rate of return is negative and infinitely large on this investment in schooling.

Source:

T. P. Schultz, *Returns to Education in Bogota, Colombia,* RM-5645-RC/AID, Santa Monica, The RAND Corporation, November 1968, Table 7.

Table 17

ESTIMATED COSTS PER STUDENT AT VARIOUS EDUCATIONAL LEVELS IN COLOMBIA, 1962

	Primary Education	Secondary Education	Higher Education
Central and state government expenditures on education, 1962 (thousand pesos)			
Operating costs	354,971	100,619	137,008
Investment costs	114,376	43,791	8,577
Total costs	469,347	144,410	145,585
Number of students, 1962 (thousands)			
Public	1,691	97	13
Private	303	170	20
Total	2,294	267	33
Government operating cost in 1962 per student			
Public schools	209	1,037	10,539
Public and private schools	155	377	4,152

Sources:

1962 Government budget from Alejandro Bernal Escobar, Adres Benoit, Berta Corredor, and Isaac Wust, *La Educacion en Colombia,* Centro de Investigaciones Sociales, Departmento Socioeconomico, Oficina Internacional de Investigaciones, Sociales de Freres, Lovaina (Belgica) y Bogota (Colombia), 1965.

Student enrollment totals for primary secondary schools derived from the low estimate series prepared by Albert Berry, Yale University. See Table 13.

Student enrollment totals for higher education derived from the *Social Progress Trust Fund, Fifth Annual Report 1965,* Washington, D.C., Inter-American Development Bank, 1966, p. 236.

available. On the basis of these incomplete data, the public expenditures per student in higher education are some 40 times those spent per primary school student, and secondary school students receive about four times that spent on primary school students. Even when rough allowance is made for municipal government contributions to the cost of primary schools, for which no consolidated accounts are available, the ratio of public student expenditures in higher to primary education remains in excess of thirty to one.[1]

Adding these rough estimates[2] of the public costs of education to the private ones in Table 15, the partial "social" rates of return to men for primary education declines to 15.3, secondary to 26.5 percent, vocational education to 35.4 percent, and university education to 2.9 percent. For women the "social" return on secondary education is 13.5 percent, vocational education is 39.8 percent, and university education is 3.6 percent.

The disparity in levels of returns is greater with the inclusion of public costs of education, which are heavily weighted toward students in institutions of higher education where private returns were already low. High returns associated with secondary and vocational education and substantial returns to primary education for men compare favorably with those estimated for other countries and shown in Table 18, though, of course, these estimates are in no sense exactly comparable among countries. But the low rates of private and social return to university education in Colombia are exceptional and warrant further comment. What independent evidence is there that university training repays students meagerly in Colombia?

One such sign is the increasing emigration of engineers, doctors, and technical university trained personnel from Colombia in the 1960s. Accurate records of emigration and immigration by educational attainment are not available to assess the outflow of human capital from Colombia. But a Pan American Health Organization study inferred from

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[1] T. P. Schultz, *Returns to Education in Bogota, Colombia.*

[2] Corrected for price level changes to 1965.

Table 18

INTERNATIONAL COMPARISONS OF RATES OF RETURN TO EDUCATION

Country Year Type of Rate	Colombia[a] 1965 Private	Colombia[a] 1965 Social	Mexico[b] 1963 Private	Chile[c] 1959 Social	Venezuela[d] 1957 Social Urban	Puerto Rico[e] 1959 Private Urban	Philippines[f] 1966 Private	India[g] 1960-61	U.S.A.[h] 1959 Private North-White
Approximate educational levels									
1. Primary over none	18	15	45	24	82	28	9	17	22
2. Middle over primary			17	29				14	16
3. Matriculation over middle	34	27	15	17	17	14	29	12	16
4. University over matriculation	5	3	40	12	23	15	12	10	10

Notes:

[a]Bogota men, the private return from Table 16 of this study adjusted for hours worked, the social return cited on preceding page.

[b]Men: M. Corney, "Rates of Return to Schooling in Latin America," *Journal of Human Resources*, Vol. II, No. 3, Summer 1967, Table 7, p. 368.

[c]Men and Women: A. Harberger and M. Selowsky, "Key Factors in Economic Growth in Chile," paper at Cornell University Conference *Next Decade in Latin American Development*, April 1966 (mimeo).

[d]Urban males presumably: C. Shoup, *The Fiscal System of Venezuela*, Baltimore, John Hopkins University Press, 1959.

[e]Men: H. R. Carby-Samuels, "Income and Returns to Education in Puerto Rico," University of Chicago, August 30, 1965 (mimeo), Table XII, p. 22.

[f]Men: J. Williamson and D. DeVoretz, "Education as an Asset in the Philippine Economy," Institute of Economic Development and Research, School of Economics, University of the Philippines, Discussion paper 67-15, November 6, 1967, Table 5.3.1, p. 39.

[g]Men: A. M. Nalla Gounden, "Investment in Education in India," *Journal of Human Resources*, Vol. II, No. 3, Summer 1967, Table 2, p. 352.

[h]Men: G. Hanoch, "An Economic Analysis of Earnings and Schooling," *Journal of Human Resources*, Vol. II, No. 3, Summer 1967, Table 3, p. 322.

the severity of the exodus of Colombians applying for immigration visas to the United States in the period 1961-1963 that the professional brain drain was taking on serious proportions. This outflow of professional talent may be a sensitive indicator of the low private rate of return on university education in Colombia in the 1960s.

Relative Skill Shortages: Qualitative Evidence from an Interview Study

Estimates of the rate of return to different kinds and levels of schooling provide some rough indications regarding fruitful directions for public policy. However, the conceptual and practical problems with the data are serious. The income data include income from property as well as wages and salaries, and there is considerable uncertainty both as to the accuracy of the property income data and the effect of the property income inclusion on the estimates of the rate of return by education class. Further, the data presented relate to a moment in the past; policy must look to the future. This consideration is particularly important in that the last ten years or so have seen something of a revolution in the public view of the value of education (and hence in the educational prerequisites for various types of employment). For these reasons it is highly desirable to complement the rate of return information with other information on the payoffs to different kinds of education and training, especially with information that provides some kind of time frame for tentative forward extrapolation. The discussion in this section is based both on an interview study conducted in the summer of 1967 of a variety of Colombian employers and on a limited amount of time series data on the wage rates of different occupational classes.[1]

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[1]For a more complete discussion of the results of the interview study see R. L. Slighton, *Relative Wages, Skill Shortages, and Changes in Income Distribution in Urban Colombia,* RM-5651-AID/RC, Santa Monica, The RAND Corporation, November 1968.

The interviews were carried out in the four major cities of Colombia: Bogota, Medellin, Barranquilla, and Cali. The sample of organizations visited included 36 manufacturing firms, nine universities, 21 government and quasi-public agencies, and four financial

Perhaps the most important conclusion we have drawn from our interviews is that the 1960s are indeed a period of flux. With few exceptions, the organizations interviewed indicated that, as of mid 1967, they did not feel a significant problem in hiring people with at least the nominal education and training backgrounds for most types of middle level and highly skilled jobs. The interviewees indicated that the lack of felt shortage of people with at least nominal training and education at medium and relatively high levels is a fairly recent phenomenon.

When Colombia began its surge of industrialization after World War II, there was a definite general skill shortage problem. Foreign firms establishing plants in Colombia often felt it necessary to import virtually all skilled manpower -- even down to the level of bulldozer operator. It is not apparent when this situation began to change. There are no good data prior to 1964, only opinions. Most of the executives who were interviewed felt that the wages of professionals had been declining relative to the general wage level for some time; "for some time" appears to mean "for about the past decade." However, this decline does not seem to have applied with equal force to all professional categories. As near as can be determined, the wages of the very highly trained (graduates from the more prestigious local or foreign universities) have more or less kept pace with the rest of the labor force. The largest relative wage declines appear to have been of those who are marginally professional -- the junior accountants, laboratory technicians, and, most important, the senior clerical personnel. It also is widely believed that the wages of skilled workers declined relative to those of unskilled workers.

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institutions. Although the sample makes no claim to be statistically representative of the entire labor market, considerable care was taken to secure a sample that reflected a wide variation of experience with respect to nationality of management, kind of technology, size of work force, and degree of organization of the labor force. There were no small semi-craft firms in the sample, although the representatives of one organization that was interviewed the Caja Agraria, claimed to be able to describe the characteristics of that part of the labor market that applies to such firms.

After 1964, some data are available. Table 19 does seem to bear out the beliefs discussed above, at least for the June 1964-May 1967 period.[1] The wage rates of professionals appear to have declined relative to those of skilled labor, and those of skilled labor have declined relative to those of semiskilled and unskilled labor.

It is extremely difficult to interpret these data -- either the relative compression of wage differentials by level of skill and profession, or the interview assertions that Colombia does not now suffer from many skill shortage bottlenecks. There clearly are several factors at work, and it is important that one try to separate them. First, since the early 1950s, there has been a significant increase in the percentage of new entrants to the Colombian labor force who have progressed higher up the educational ladder. Table 20 shows the sharp, across the board rise in the percentage of people in school from 1951 to 1964. University enrollments have increased fourfold since 1951, and the proportion of this enrollment in engineering, natural science, and agriculture has doubled. There has been an equally dramatic increase in vocational school enrollments and graduates. Enrollment in public vocational schools increased from 19,400 in 1951 to 38,900 in 1957 to 71,100 in 1963. The national apprentice program (SENA), which began in 1958, alone now graduates over 40,000 students each year.[2]

One would have expected that this rapid change in supply conditions would have somewhat alleviated the overt skill shortage problem of the early postwar period. Given the rapid rate of growth of modern industry, however, one would not have expected growth of demand to lag greatly behind growth of supply. Up to 1964 or so it is not clear that it did; evidence of falling relative wages for the better trained and educated are largely recollections of personnel managers whose memories may be unduly influenced by the past few years. Further, as of 1965 the returns to secondary education were handsome, and the

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[1] For a discussion of these data see R. Slighton, *Relative Wages, Skill Shortages, and Changes in Income Distribution in Colombia.*

[2] SENA, Division of Human Resources, Bogota, 1967, mimeo.

Table 19

CHANGES IN WAGE RATES BY OCCUPATION,
BOGOTA, JULY 1964 - MAY 1967

Occupation	Percentage Increase in Hiring Salaries
Unskilled labor	38
Semiskilled machine operators	36
Skilled mechanics	29
Messengers	23
Semiskilled office workers	24
Secretaries	22
Skilled clerical workers	22
Professional accountants	25
Engineers	26

Note:
The increase in the working class cost of living index in Bogota over this period was 37 percent. The cost of living index for the middle class increased 39 percent.

Source:
Unpublished data collected by Industrial Relations Consultants, Bogota.

Table 20

STUDENTS PER HUNDRED POPULATION BY AGE, SEX, AND REGION,
COLOMBIA, 1951 and 1964

Age in Years	Total Population				Cabeceras or Urban Population				Other Regions or Rural Population			
	Male		Female		Male		Female		Male		Female	
	1951	1964	1951	1964	1951	1964	1951	1964	1951	1964	1951	1964
5-9	17.3	25.6	17.6	26.3	27.5	36.9	27.6	36.9	12.0	15.1	12.0	15.7
10-14	39.7	58.2	38.0	56.1	59.6	76.2	55.6	70.7	28.8	40.7	26.1	39.1
15-19	13.7	26.6	9.5	22.0	26.6	43.2	16.1	31.5	6.2	9.5	3.9	7.5
20-24	2.8	5.9	.9	2.3	6.2	10.6	1.6	3.6	.6	1.0	.2	.5
25-29	.6	1.0	.3	.4	1.3	1.8	.5	.6	.1	.2	.1	.1

Sources:

Censo de Poblacion de Colombia 1951 Resumen, Table 11, p. 37, and Table 39, p. 188. *XIII Censo Nacional de Poblacion (Julio 15 de 1964) Resumen General*, Table 7, pp. 33 ff., and Table 41, pp. 143 ff.

relative decline in wages since that time is not sufficient to change that picture.

But the relatively high unemployment rates experienced in the past few years by secondary school and college graduates does suggest that, at least recently, supply has been beginning to outrun demand. A sample of unemployment rates in the mid 1960s by level of education is given in Table 21. We suspect this is a recent phenomenon, as well may be the decline in the relative wage rates of the better educated. Since 1962 or 1963 Colombia has been in recession. Although employment in modern manufacturing increased nearly 18 percent between 1958 and 1962, it increased only 3 percent between 1962 and 1966. At the same time the supply of workers with industrial or technical training has been mounting rapidly. The number of graduates of the SENA vocational programs over the 1962-1966 period was 2-1/2 times the number graduated between 1958 and 1962. The number of university trained people also increased rapidly, the expansion of the supply of engineers being particularly noteworthy. It would be extremely desirable to be able to determine whether the current situation of redundant skills is a phenomenon of recession or an indication of a secular imbalance in supply and demand. We cannot, in fact, make that discrimination with any rigor, although we suspect the former interpretation is more likely.

Although the clarity of the long run educational policy implications of the interview evidence is badly obscured by a temporary phenomenon, there are some clues worth considering. The rate of return on investment in higher education of the present quality and distribution of fields may be low, but there may be a high rate of return on high quality advanced education in certain fields. And although we do not want to reject the finding of a high rate of return at the vocational and secondary school levels, here too quality and field probably will be of increasing importance.

Even with recession, there still seems to be strong demand for persons capable of moving into high level managerial jobs. At the present time only a small proportion of the Colombian urban economy

Table 21

UNEMPLOYMENT RATES BY LEVEL OF EDUCATION AND AGE
(percent)

Level of Education (years)	Sample			
	Bogota March 1966	Bogota March 1965	Bogota March 1964	Cali March 1965
	A. Unemployment Rates by Level of Education			
0-1	8	7	6	7
2-4	12	10	6	13
5	11	12	9	19
6-8	13	10	8	11
9-10	8	8	8	10
11	8	8	5	9
12-15	10	8	4	16
16+	2	3	4	--
Age	B. Unemployment Rates by Age			
14-19	20	19	14	27
20-24	17	16	9	17
25-29	9	4	6	11
30-39	6	5	4	8
40+	4	5	4	8

Source:
Bogota samples: unpublished data, CEDE. Cali sample: Centro de Investigaciones Economicas, Universidad del Valle, *Empleo y Desempleo de la Mano de Obra en la Ciudad de Cali*, Cali, 1965.

is managed by professionals, but the proportion is growing.[1] The chief bottleneck today to the expansion of professionalism in business management is probably the limited capacity of the educational system to train management specialists.[2] This is the one important skill class that is not currently in excess supply. In the past the demand for such individuals has been small, and it is more this than any inherent inertia on the part of Colombian educational institutions that explains the current thinness of supply. The rapidly increasing demand for management specialists can probably be ascribed to a number of factors. One important cause of this trend is the higher level of educational attainments of the younger generation of owner-managers. Another is that many Colombian businessmen have served their managerial apprenticeships in foreign firms. The increasing complexity of the typical Colombian business operation itself creates a further need for professionalism in management. Improvements in transportation have widened markets and exposed local monopolies to the threat of competition. The technology of the industries created in the surge toward import substitution is more complex than in the older industries and -- more important -- it is more subject to change. The growth of a union movement that is increasingly professional in its bargaining techniques has also created a demand for a new type of management specialist.

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[1] We are not sure that it is possible to give an adequate definition of "professionalism" or "professional management." The essence of what we are trying to identify with such words is the habit of constant re-examination of the profitmaking possibilities of the firm. Typically this will involve the acquisition of sufficient technical expertise to permit reevaluation of production processes in light of changes in technological opportunities, a nonpassive attitude toward product and market development, and a strong concern for the possibilities of increasing administrative efficiency through specialization.

[2] The undergraduate faculty of business at the Universidad del Valle may dispute this assertion on the grounds that it has had some difficulty in placing all of its graduates. We suspect that this difficulty will disappear quickly once the facts that this faculty is in existence and that it is an operation of high quality are more widely publicized outside Cali. In both Bogota and Medellin the demand for management specialists does not appear to be satisfied.

There also appears to be considerable demand for high quality technical people. The demand for engineering graduates from schools such as the Universidad de los Andes or the Universidad Industrial de Santander is currently quite brisk, and the real wages paid such graduates appear to have grown at a rate that is similar to the average of all industrial workers in recent years. The fortunes of the technical graduates of lesser qualification do not appear to have been so favorable. The phenomenon of a greatly increased intra-occupational spread in wages appears in its most exaggerated form for law school graduates.

The low rate of return figures on higher education primarily appear to be giving a signal relating to quality and composition of higher education, not an indication that certain kinds of higher education are not important. Similarly, the implications of high rate of return to secondary and vocational education appear to require modification in terms of quality and field of training. Interviews suggest that even though the average rate of return still is high, the crisis phase of the development of a supply of skilled blue-collar workers is over. The need now is to secure a better fit between the patterns of enrollment and demand (for example, fewer automobile mechanics) and to upgrade course quality.

Opinions of SENA within industry differ widely. Many employers are simply grateful that its training facilities exist. Others complain about the quality of SENA graduates, although most are in agreement that SENA trained workers are more capable than the older generation of journeymen who have not gone through any sort of formal training program. Still others appear concerned that training is too narrow and needs to be complemented by secondary education. The commonly expressed preference for workers with public industrial school backgrounds appears to be less the result of dissatisfaction with the technical competence of the SENA graduate than the feeling that such workers were relatively deficient with respect to the level of their general education.

Given this current quality of graduate -- and given the current level of aggregate demand -- it would appear that there is something

of a surplus supply of certain of the skill types that SENA trains. The evidence for this is not totally impressionistic. SENA itself gathered information on the employment experience of its graduates in a sample survey carried out in the summer of 1965. These results have never been released, but the unemployment ratio among the graduates who were sampled was allegedly quite high. It was certainly so in the one subsample for which we have been able to obtain information. Although SENA does not compete with a well established public vocational education system in Barranquilla, the proportion of SENA graduates in that city who were unemployed in 1965 was 28 percent.[1]

It is our judgment that an increasing premium is being placed on quality at virtually all skill levels. The ability to recognize quality and appreciate it still is limited by the supply of well trained professional managers. But recent developments probably indicate a trend. Many employers appear to be taking advantage of current labor market conditions to upgrade the quality of their labor force. Whereas five years ago the general educational requirement for employment in modern manufacturing was not likely to have been higher than the primary school certificate, many firms now require two or three years of secondary education for all workers. A few firms whose production operations cannot be routinized now even require that production trainees be secondary school graduates.[2] In the past, production supervisors (foremen) have typically been recruited from the blue-collar labor force, but many firms are now hiring secondary school graduates or college dropouts and training them specifically for such positions. A similar upgrading of the educational requirements for office or administrative chiefs of section is evident. These positions have commonly been filled by individuals with no more than a secondary school certificate who worked through the ranks, but some firms are now redefining them as

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[1] Data furnished by SENA personnel in Barranquilla.

[2] It should be noted that these firms have experienced a rate of labor turnover in these positions that is phenomenal by Colombian standards.

"executive" jobs and establishing a university degree as an educational prerequisite.

This trend toward an upgrading of the educational requirements embodied in a given job title is not simply a response to a situation of excess supply of most skill classes. It also represents a change in managerial perception of the way in which labor enters into the production process. By and large it appears that the more highly educated the management the greater the relative demand for skilled and highly skilled manpower. This preference represents a perception of the relative productivities of alternative labor skill mixes rather than a cultural bias. Although anything like proof of the rightness of this perception is hardly available, the firms taking the lead in upgrading the quality of their labor force have typically amassed impressive growth and profit records.

Scientific and Technical Research, Consulting, and Information Services

To a considerable degree every one of the preceding suggested policy directions have been colored by the view that the industrial development process in less developed countries involves technological change as much as it does resource accumulation. In general, the kinds of policies we have discussed will work to accelerate that process and make it more efficient by providing the necessary inputs and a suitable environment of incentives and constraints. It would appear, however, that the rate of return might be high on certain activities aimed directly at the technological change process -- industrial R&D, and technical consulting and information services.

Unfortunately, very little research has been done on the question. And very little seems to exist in the way of relevant experience to be researched. The following discussion represents, therefore, an exploratory attempt to pull together a few disparate strands of existing literature and place them in a context that seems to make

some sense. Much more than in the other policy areas we have discussed, we here are on poorly explored terrain.[1]

The Nature of the Policy Problem

Industrial R&D in a Less Developed Economy. In such fields as agriculture and health, a strong argument can be made that the rate of return is high on R&D focused specifically on the problems of the less developed countries, but the analytic case for industrial R&D is far weaker and the empirical evidence virtually nil. With respect to agricultural research the case can be made that soil types, temperature, rainfall, the insect and other pest population, and other characteristics of the environment tend to be unique to the country or area; hence technology that works well in developed economies may be ill-adapted to less developed ones. There is strong evidence in support of this argument, for in many cases U.S. seeds and techniques have not worked out well in a less developed country. In addition, there are striking examples of very high payoffs to indigenous agricultural research and development -- the Rockefeller corn and rice varieties and barley technology for Colombia, for example. Regarding health and medical R&D a similar case can be made based on the special environmental factors in many of the less developed countries.

This sort of argument does not readily apply to industrial R&D. A central theme of our analysis of manufacturing development has been that technology developed in advanced countries, although not necessarily optimal, nonetheless can generally be used to considerable economic advantage in the less developed countries. Late developing countries are blessed by the legacies of the advances in technology achieved through efforts of the developed countries. In many industries the rate of return on investment in the equipment embodying existing technology is extremely high, and a large amount of such

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[1] For the best available general discussion, see R. Staley and D. Fulton, *Scientific Research and Progress in Newly Developing Countries*, Menlo Park, Stanford Research Institute, 1961.

investment can be undertaken each year at high rates of return.[1] Under such circumstances, the alternative costs of investing in industrial research and development would seem to signal that this activity should play a minor role in a less developed country investment mix.

There is a counter argument, however, that suggests that certain kinds of industrial R&D may be able to meet the high rate of return hurdle. Three conceptually separate kinds of R&D and investment situations have been discussed in this connection. One is what might be called "special circumstance," or "adaptive" to the different factor supply situations of a less developed country.[2] The arguments here are much like those regarding agricultural R&D discussed above, although less powerful. In anticipation of the recent evolution of the theory of induced invention, the development literature has noted for some time that process and product invention and design in developed countries have been pulled in the direction of satisfying the product demands and cost constraints of a high income, high wage, large scale economy, with plentiful capital and skill. That the technologies and the programs and equipment in which they are embodied are in most cases economically efficient relative to traditional technology, even in the vastly different environment of the less developed economies, is testimony to the magnitude of the advances achieved. However, the argument has been that research, development, and design aimed at doing even better under the demand patterns, resource endowments, and scale constraints of the less developed countries would result in an even more efficient technology. Less mentioned in the theoretical literature but obviously in the same spirit, the materials endowments of a less developed country such as Colombia differ in many cases from those in which the technology was developed. Here too research and development may pay off for a less developed country.

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[1] See R. Nelson, *A Study of Industrialization in Colombia: Part I, Analysis.*

[2] For a good discussion see R. Eckaus, "Notes on Invention and Innovation in Less Developed Countries," *American Economic Review,* Vol. LVI, No. 2, May 1966.

Such a specification of objectives (particularly the focus on local materials) appears to be implicit, if not explicit, in guiding research direction in some of the research institutions that have been established in the less developed countries. The Institute for Technological Research in Colombia is an interesting example.

The possible payoff of evolving a quite different kind of industrial R&D capability is suggested by the writings of Raymond Vernon and his collaborators.[1] By posing the theory of comparative advantage in manufacturing in dynamic terms, Vernon has focused attention on a generally overlooked problem. Where product and process innovation is proceeding rapidly in the more developed countries, even if a less developed country learns over time to operate a particular process or produce a product quite efficiently, its capability is likely to be made obsolete, and even an economic liability, unless it is able to stay up with new developments. This phenomenon can be viewed as an argument that less developed countries should stay out of these industries. On the other hand, to the extent that they do move progressively into these industries, the argument points to the desirability either of a close relationship with a company in a developed country that is staying on top of new developments or a sufficient internal R&D capability to follow these new developments and, increasingly, to be innovative.

Taiwan and Hong Kong appear to have played this game successfully. Here the key elements seem to be a well educated (hence trainable and flexible), low wage labor force and a subsidiary or correspondent relationship with companies in the United States and Japan that perform the continual updating of design function. It would appear that little R&D is done internally now. But it is a good bet that an indigenous R&D capability will evolve in the near future, particularly if domestically owned firms get into the business of supplying components. As the countries develop further and wage rates rise, it is likely

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[1] R. Vernon, "International Investment and International Trade in Product Cycles," *Quarterly Journal of Economics*, Vol. LXXX, No. 2, June 1966.

that an indigenous R&D capability is going to be increasingly important for the maintenance of international competitiveness.

The importance of anticipating an evolving structure leads naturally into a third set of arguments for an industry related research and development effort by a developing country. In the early stages of the industrial modernization process, a large fraction of high level education of scientists and engineers will have to take place in universities abroad. As the economy develops, and as the number of foreign trained technical experts grows, it will become increasingly possible, and economic, to carry out a growing fraction of a high level education in the home country. But both the direct returns to industrial development, and the ability of the country progressively to increase its high level teaching capability, will depend in good part on the ability of the country to hold its trained people and keep them up to date. In turn, this may depend importantly on the existence of what have been called "centers of research excellence."

This is the basis for an argument in favor of investing in basic research in the scientific and engineering fields underlying manufacturing technology in institutions associated with centers of high level education. The shorter run payoffs are viewed as indirect -- in terms of education and holding people -- rather than direct in terms of new technology. The direct payoffs are viewed as long run, but they grow increasingly important as the economy moves into the technically progressive fields. In designing such research centers the critical consideration is orienting research capabilities in the direction of those kinds of industries the country should be looking to in the future. Thus the Mexican programs in the fields of physical and organic chemistry appear to compare favorably with the Indian decision to put resources into the nuclear energy field.

These arguments, one for adaptive R&D to permit better exploitation of comparative advantage, a second for evolving an intelligence and innovating R&D capability as a prerequisite for long run competitiveness in technically progressive industries, a third relating to the complementarity of a research program of excellence and the

education function and the holding of scientists and engineers in a country, together provide a qualitative justification for industrial R&D as at least a minor portion of a developing country's investment budget. Unfortunately there have been no studies, to our knowledge, that permit assessment of the actual returns to industrial R&D in developing countries. In most countries it is clear that very little is done. In countries where some industrial R&D is carried on (principally in public facilities) there seems to have been little in the way of systematic appraisal of the actual returns. Most of the laudatory comments regarding industrial R&D in a less developed country really amount to statements that such and such an institution has been established and still survives:

Consulting and Information Services. The appropriate kind and magnitude of investment in technical consulting and information services also involves a set of difficult and unexplored questions. The questions are quite different, however. The argument that industrial R&D should play a limited role in a developing economy's investment budget is the other side of the argument that the rate of return is very high from adopting existing technology. This would appear to imply a high rate of return to activities aimed specifically at speeding and facilitating the adoption and learning process. But there are two kinds of difficulties involved in leaping to a policy conclusion regarding public investment in technical consulting and information services. The first is that a high rate of return on adoption in itself may be all that is required to generate a reasonably efficient and rapid pace of adoption. The major policy actions needed to generate efficient adoption may have more to do with provision of necessary inputs and conditions -- such as educating a skilled work force, providing credit, maintaining reasonably competitive product and factor markets -- than providing technical assistance. The second is that there is very little relevant experience or interpretable evidence regarding the actual performance of different kinds of industrial technical assistance programs.

The evidence is quite striking that the pace of acceptance of new technology, both in agriculture and industry, is strongly related to

its profitability.[1] Nonetheless, in agriculture the United States has found it worthwhile to invest directly in information services. The rationale for agricultural extension and other information services supported through the USDA rests on the "public good" characteristics of information as a commodity. Unless information is tied to a particular product, it is very difficult for a "seller" to avoid having that information spread beyond the range of people who have paid for it. On the other hand, there are social and economic costs involved in restricting access to information. In such circumstances the private profitability of providing certain kinds of information services is likely to be far below its value, and the attempt on the part of a private firm to capture its value by restricting access imposes an unnecessary cost on society. Scattered evidence suggests that the social rate of return on agricultural extension efforts has been high. Many underdeveloped countries are now imitating the U.S. policy.

In manufacturing it would seem that much the same kinds of arguments apply. Yet with limited exceptions, Western governments have not supported or undertaken technical information services. Part of the reason is that to a considerable extent technological advances in manufacturing tend to be embodied in equipment or materials produced by private business firms with an obvious strong (if perhaps biased) economic interest in disseminating information about them. Thus salesmen and advertising are expected to, and do, play a major role in the information dissemination process in manufacturing. Second, in manufacturing, to a significantly greater extent than in agriculture, technical societies and organizations that disseminate information have been able to function without the assistance of public or publically supported organizations. Third, perhaps because of the generally larger size and greater heterogeneity of the manufacturing unit, private consultants and consulting organizations have found a profitable demand for their services. This has happened to a far greater degree than in agriculture.

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[1] See R. Nelson, M. J. Peck, and E. Kalacheck, *Technology, Economic Growth, and Public Policy*, Washington, D.C., The Brookings Institution, 1967.

The demands on the part of the manufacturing sector for public information services, at least in the United States, have centered in two areas: first, economic statistics; second, information regarding the results of government or government supported R&D. To a much more limited extent, but growing in importance, state or federally supported information and consulting services for small and medium size manufacturing companies are beginning to evolve.[1] The rationale here has been the belief that there are many process innovations not embodied in salable products, and hence not pushed by suppliers, that firms not employing high level technical people do not stay up with.

This last kind of public activity, not widely used in developed countries, would appear to be potentially quite promising as a public investment in a less developed country. Its rationale -- that many firms are neither using optimum processes nor employing people with sufficient training to understand this or understand what to do -- certainly fits a far larger fraction of manufacturing firms in Colombia than in the United States.

But the second problem mentioned at the start of this section remains. There is very little in the way of usable information regarding how an industrial extension service should be set up, or exactly what it should do, if it is to have a substantial impact. The limited U.S. experience has not been analyzed in any depth. There is a voluminous literature about productivity centers established under the European Recovery Program which presents arguments for their establishment and roughly describes their activities but provides no information at all to enable assessment of their impact. Perhaps largely as a result of habits of thought developed in the European Recovery Program, productivity centers have been springing up in many less developed economies for some years now. Again there is literature describing their rationale and what they tend to do. For example, a survey of several productivity centers in Asia describes their activity in terms of symposia and conferences, training courses, studies, visits by home

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[1] Ibid.

groups abroad and consultations at home with foreign experts, and special consultation services.[1] This appears to be a typical menu of activities. It is all probably quite splendid, but no one has studied the effects of these activities very carefully or systematically.

The Current Situation in Colombia

Colombia's stock of scientific and engineering manpower appears to be about average for Latin American countries of comparable per capita income. Brazil, with roughly comparable per capita income, has about three times as many engineers as Colombia and is roughly three times as big. Argentina has a significantly higher fraction of engineers to population, but has a much higher per capita income.

Colombian manufacturing industry employed only a portion of the roughly 7,000-8,000 engineers and physical scientists available in the mid 1960s. Unfortunately, the principal source of information on industry employment of highly educated people has a separate category for administrators and does not tell the percent of administrators who are scientists and engineers. But aside from "administrators" the study could locate only 118 electrical and electronic engineers, 258 mechanical engineers, 388 chemical engineers, and 298 chemists, in all of Colombian manufacturing industry.[2] There were only 75 chemical engineers and 162 chemists in the 91 sampled firms in the chemical industry. There were roughly 100 electrical and mechanical engineers in the 55 sampled firms in the electrical equipment and machinery industries.

Although these numbers have to be augmented greatly to take into account the engineers and scientists in administration, it is clear that Colombian industry does not have the personnel to support much in the way of industrial R&D. In fact, almost none seems to be done.

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[1] C. Wolf, R. Gangadhavan, and K. C. Han, *Industrial Productivity and Economic Growth,* Tokyo, Asian Productivity Organization, December 1964.

[2] Instituto Colombiano de Especializacion Tecnica en el Exterior, *Recursos y Requerimientos de Personal de Alto Nivel,* Bogota, ICETEX, 1965.

Hadley, in a nearly exhaustive study of the largest Colombian firms, reported that only five could be considered as doing any R&D at all.[1] Outside of the manufacturing sector itself only the Institute of Technological Research (IIT) can be considered as seriously in the industrial R&D business. IIT, however, has fewer than fifty professional scientists and engineers on its staff.

The same shortage of high level technical people in Colombian industry that makes the country dependent upon foreign sources for new technology makes it dependent upon foreign high level technicians for technical consulting and information. Colombian subsidiaries of foreign firms, or Colombian firms that have partial foreign ownership, clearly are in this category. Hadley reports that many of the large, domestically owned Colombian firms have technical assistance arrangements with some foreign firm, usually U.S.[2] Our own interviews indicate the common presence of a kind of arrangement similar to that in developed countries -- the use of equipment and materials suppliers (generally foreign) for technical assistance. Finally, although real evidence is lacking regarding the importance of this source, technical consulting firms of various sorts (often branches of U.S. consulting companies) appear to play a role in major investment and plant layout and design decisions of Colombian firms.

The preceding suggests, on one hand, that the returns might be high for government supported activities in industrial R&D and technical information services, and on the other hand, because of the shortage of qualified people, the alternative costs probably are high as well.

Clearly a major program is dependent upon increasing the number of available scientists and engineers. In recent years, Colombia's output of new engineering graduates has been relatively high by Latin American standards. In 1961, Colombia graduated 575 engineers, significantly more per capita than Mexico and Brazil. By the mid 1960s yearly

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[1] G. Hadley, *Some Characteristics of Colombian Industry*, Bogota, Universidad de Los Andes, 1965.

[2] *Ibid.*

output of new engineers was around 700. The output of natural scientists was much smaller.[1] However, as mentioned earlier, Colombia was having serious trouble keeping these people at home. Between 1960 and 1965 Colombia was surpassed only by Argentina, among Latin American countries, in the number of professional and technical workers migrating to the United States.[2] In 1964 alone, 70 engineers migrated to the United States, and many more to Venezuela. The drain of engineers was significantly less from Brazil and Mexico, both of which have many more engineers, and graduate more each year. Interview evidence suggests that some of the emigres consider that working in the United States is part of graduate training and ultimately return to Colombia. Yet given the low salaries of engineers and scientists in Colombia relative to what they can apparently earn in the United States or even Venezuela, the brain drain problem has to be considered serious.

The problem of increasing Colombia's investment in industrial R&D and technical information and consulting services is a good example of why labor market policy, education, and the kind of activity discussed in this section must be looked at as a package. A significant increase in industrial R&D, and improvement in the technical information and consulting machinery, requires, above all, more engineers and scientists coming out of the educational system. And it requires that these people find employment opportunities in Colombia attractive enough so that they will stay. Only as these conditions are met does it make sense to think about policy toward industrial research and development and technical services.

Possible Policy Directions

It appears to us that it is possible to design a complementary package of policies; indeed, a complementary package is implicit in the earlier diagnosis. The private rate of return on higher education

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[1] Pan-American Health Organization, *Migration of Health Personnel, Scientists and Engineers from Latin America,* Washington, D.C., World Health Organization, 1966.

[2] *Ibid.*

simply is not high in Colombia, nor does it seem to be in other countries of comparable development levels where the data have been analyzed. Although the return to higher education in engineering seems to be above average, the brain drain in Colombia, and in other countries, testifies that the private marginal productivity of an engineer is higher in the more developed than the less developed countries. If one believes that private returns to scientists and engineers in industry reflect long run social marginal productivity reasonably accurately, there is little case for increasing government investment in high level scientific and engineering education. If one believes that the long run social returns to a growing pool of high level technical talent is far above short run private returns and that private perception of these returns is distorted by a lack of professionalism in management, then one has a case for investment in high level education. But so long as the earnings of technically trained people in Colombia are significantly below their opportunities abroad, one also has a case that education is not enough.

There are several reasons for being hopeful that the demand for relatively high level technical personnel will increase. First, the major thrust of the policies suggested earlier will be to increase competitive pressure on Colombian firms and force them to pay more attention to questions of productive efficiency and product quality. Second, an easing of the import restraint will permit a significantly higher level of investment in capital equipment. Even so, the extent of market disequilibrium is such that government establishment and support of institutions engaged in industrial R&D and technical information services is probably needed. It is important that Colombian firms have access to high level technical expertise without being committed at the start to hiring such people full time. Even apart from the learning aspect, in a country where the number of scientists and engineers is limited and most of the firms are small, a strong case can be made that a considerable portion of technical expertise should be in a common pool rather than scattered in separate firms and not generally fully employed at high level work. The argument that firms need to learn to use such personnel strengthens the case

and suggests as well two facets of policy that might not otherwise be obvious. First, some strong mechanism for inducing utilization of the service may need to be developed. One such mechanism is to have some kind of technical audit and, if recommended, a technical consulting arrangement as a prerequisite for credit under government run credit programs. Colombian firms are far more likely to approach a public agency for credit than for technical assistance, and they are far more likely to take advice when better performance is a requisite for that credit than when a public agency tries to push advice on them. Second, since a major function of the program is to induce firms to hire high level personnel, the technical consultant service should not view the "pirating" of its technicians by private firms as a problem.

There would be considerable advantage to having such an institution linked closely with Colombia's engineering schools. In the first place it could serve as the research and consulting outlet for faculty, making faculty positions more attractive and attracting Colombia's top talent to the research and consulting organization. Relatedly, contact with such an institution might serve to better acquaint academicians, many of them trained in the United States, with the real problems and opportunities of Colombian industry. Second, the institution would serve as a natural source of first employment, if no more attractive offer beckoned, for new graduates.

V. UNEMPLOYMENT, DUALISM, AND POPULATION POLICY

THE POLICIES discussed in the preceding two chapters are designed to set an environment within which welfare can increase more rapidly than it has over the past decade. Given Colombia's dual structure (a structure that seems intrinsic to the development process) the most important index of progress in increasing average welfare will be the growth of employment in the modern sectors relative to the growth of population and the work force. The rate of increase of employment in the high productivity sectors will depend in large part on the government's success in dealing with the policy problems outlined in the preceding chapters. The rate of population growth is something else, however. If the Colombian government chooses not to implement large scale public population programs, the population increase in Colombia over the next four decades or so is likely to require unprecedentedly large increases in employment if significant advances in average welfare are to be achieved.

Population Growth and Economic Development

It clearly is naive to believe that population growth represents a simple subtraction from income growth in determining the growth of personal welfare. In the first place, per capita national income certainly is only a very partial index of welfare. The wide range of general problems with this index is well known and need not be discussed here. However, in the context of this discussion it must be stressed, and recognized, that children and people cannot be considered simply as claimants on a national income "pie." Parents and society

assign value to children that transcends their future productive potential. Viewed simply as an economic investment, at reasonable rates of discount children are a very bad investment indeed, but this is scarcely an argument for everyone to stop having children.[1] More narrowly, since consumption requirements are smaller for children than adults, a given level of per capita income clearly means a more satisfactory living standard in an economy where population is growing rapidly and large fraction of the population is children than in an economy with a lower birth rate.

In the second place, the growth of output and the growth of population are not independent of one another. They would not be independent even if labor had zero marginal productivity. They certainly are not independent when labor itself contributes to production. As stressed earlier, economic growth in developing countries is not sufficiently understood today to permit precise estimates of the effects of population growth on growth of output and output per capita. However, some of the relationships are beginning to come into clearer focus.

Population growth appears to retard the growth of physical capital per capita, if not necessarily the aggregate capital stock. In low income countries, rapid population growth fueled by high birth rates is likely to depress national savings per capita. Since high fertility levels come from births of children over a longer period rather than by a drastic shortening of the intervals between births, a much larger proportion of births in high fertility populations are to parents over the age of 30. A consequence of this pattern of high fertility and child spacing is a shorter period after rearing children when parents have the opportunity to save from current earnings without depressing their consumption. High fertility and high dependency rates may be associated, therefore, with low household savings. The public sector's opportunities to save and invest its resources in tangible productive assets are also eroded by population growth, for

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[1] T. Paul Schultz, "Public Policy and Population Growth," P-3996, Santa Monica, The RAND Corporation, 1968.

public expenditures on social infrastructure are closely tied to population growth, urbanization, and the youthfulness of the population. On an *a priori* basis there is thus good reason to infer that high fertility in conjuction with low incomes tends to depress the fraction of domestic product saved and invested in physical capital. The empirical evidence, though limited, tends to confirm these conclusions. For example, Leff has found a significant negative relationship between the proportion of the population below 15 years of age and per capita national savings.[1] Even if per capita savings rates were not lower but the same, growth of population would tend to retard growth of capital per head. For a given capital-population ratio, the faster the rate of growth of population the higher must be per capita savings to sustain a given growth of capital per head. Thus the effects of rapid population growth appear doubly pernicious.

It also appears likely that in a regime of rapid population growth, a small fraction of the population reaches the progressively higher rungs on the educational ladder, and improvements in health proceed less rapidly. Data are not available to confirm this. But high fertility probably retards the rate of improvement in human resources or "capital" for the same reasons that it retards growth of physical capital per worker. Although rapid population growth ultimately implies rapid growth of the labor force (in spite of low participation rates of married women), it implies a labor force with a high fraction of untrained and inexperienced (and relatively unproductive) workers. The total effects of rapid population growth on growth of aggregate income or output is ambiguous. The effect on growth of per capita income is not. Rapid population growth reduces the rate of formation of both physical and human capital per worker while increasing the supply of inexperienced and unskilled workers. The consequence is a strong tendency to perpetuate economic dualism.

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[1] N. Leff, "Population Growth and Savings Potential," preliminary report to the Office of Program Coordination, AID, Washington, D. C., November 1967.

These factors are of unquestionable importance in shaping Colombia's growth prospects. The natural rate of increase in population is and has been relatively high by international standards. A reduction in the birth rate, even if achieved very quickly, would not change the fact that Colombia will see a rapid increase in the labor force for the next decade or two simply from the children already born. The large flow of people from the country to the city is also likely to persist for many years even if the birth rate is quickly reduced. Nevertheless there is good reason to believe that population policy, if vigorously pursued, could yield beneficial results in the near future. A reduction in the birth rate might permit an increase in national savings and investment, thus making it easier to deal with the near term surge of the labor force at the same time as it slows down the growth of the labor force fifteen years in the future. By taking some of the strain away from Colombia's sorely taxed educational resources, a decline in the birth rate can make it easier to assure that the next generation of Colombian workers will be better suited to modern industry. By reducing the growth rate of labor relative to capital, the decline will enable a larger share of the new work force to be absorbed by the modern sector.

The payoff to an effective population policy appears even higher when it is considered in the context of the policy reforms discussed in the two previous chapters. These reforms would certainly result in an increase in output. But to a considerable extent the output increase would be generated by an increase in productivity. This would take two forms: first, a progressive expansion of the modern sector relative to the craft sector, and second, an advance of productivity in the modern sector. Thus employment growth would be far smaller than output growth. Our suspicion is that what would happen would be something like the following: (1) a large initial increase in employment as slack was brought back into operation and construction and investment activity increased; (2) a transitional period with decreased output growth and a more significant decline in the rate of growth of productivity; (3) a slowdown of productivity growth and a possible

resurgence of employment growth as the modern sector comprises a larger and larger fraction of total activity. But the third stage may be a long time away.

Factors Influencing the Birth Rate

The birth rate is a matter of national concern, but it is the result of private behavior. A population policy will be successful or not depending on the extent to which it influences the number of children parents have. The basis of effective policy design therefore must be understanding of the determinants of fertility.

Much study has been addressed to the determinants and concomitants of the decline of fertility in developed countries, and increasing attention is being given to fertility in less developed countries. The large differences in fertility between developed and less developed countries is often attributed to the practice of birth control in the former and its absence in the latter. But the conspicuous variation in fertility within and among less developed countries is difficult to understand unless "natural fertility" is affected by demographic, social, and economic, as well as biological, factors. One approach to understanding differences in fertility is to begin with the preferences of parents for children and seek the determinants of birth rates among the objective characteristics of the environment that could influence their opportunities and goals. Empirical analyses of differential fertility in Puerto Rico and Colombia have found significant statistical associations between regional fertility and certain features of the parents' environment, discussed below, that were thought likely to modify the number of births parents would want.[1]

Schooling

School for children imposes opportunity costs on parents. Even if children do not work outside of the home, they provide help in the

[1] T. Paul Schultz, *A Family Planning Hypothesis*, RM-5404-RC/AID, Santa Monica, The RAND Corporation, December 1968.

home by tending younger children and performing routine chores, and this help is reduced when they attend school. School attendance also adds as a rule to direct household outlays for better clothes, school materials, transportation, and support away from home. The decision to enroll children in school involves a significant increase in the cost of having children and appears to be a strong determinant of reduced goals as to family size. The schooling of parents is also likely to affect their family size goal, but the mechanism here is different. It is thus important that one distinguish between the effects on parents' current preferences for a number of surviving children of having children currently in school and having educated parents earlier.

Child Labor

Expanded school facilities at the primary and secondary level provide a conflicting demand on the time of children and facilitate the reduction in child labor force participation. Parents are then compelled to bear the opportunity costs of their children's schooling rather than make use of their unpaid productive services in family employment. This important change in the role of children in the family reduces parents' incentives for large families and stimulates their investment in education and the acquisition of skills needed in the modern sectors of developing countries.

Employment of Women

A significant part of the costs of bearing and rearing children is the value of a mother's time spent attending to her children's needs. When her most productive activities are easily combined with child rearing in the home, the opportunity cost of the time spent caring for them is small and a large family no great inconvenience. However, the household activities traditionally performed by women such as weaving, processing family food, caring for livestock, and handicraft cottage manufacturing tend to be displaced gradually in the development process by modern food processing, textiles, and manufacturing sectors, and depreciated by the growing commercial specialization in agricultural

production itself. As development proceeds, the woman finds her most productive employment opportunities are increasingly outside of the home and even outside of the rural-agricultural sector of the economy.[1] These employment opportunities are difficult to combine with child rearing. In this more specialized economic environment, a large family extracts from parents an opportunity cost for the mother's time which may foster the acceptance of a smaller family size goal. The opportunity value of a mother's time cannot usually be measured directly, but the frequency of women participating in the paid labor force may be regarded as a useful proxy for this crucial variable. One therefore expects to find higher female participation rates and lower birth rates in an environment where women can earn more income (per unit of time).

Child Mortality

Even if the preceding factors could explain the number of children parents desire, the number of births needed to achieve this goal would not be uniquely determined. This would depend on the death rate for children, as well. Uncertainty surrounding the family formation process of births, deaths, and remarriage may also play a subtle role in this decision process. Historical evidence suggests that for birth rates to fall, the chances for child survival must first improve for an extended period. In Latin America those countries experiencing a substantial decline in birth rates all witnessed an earlier large fall in death rates.[2] The unanswered question is how long a lag will separate the decline in death rates induced in the less advanced areas of the world from the onset of the decline in birth rates.

Birth Control

The costs of birth control consist of first acquiring and evaluating information about alternative contraceptive methods and then

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[1] S. Hymer and S. Resnick, *Responsiveness of Agrarian Economies and the Importance of "Z" Goods*, Economic Growth Center Discussion Paper No. 25, Yale University, October 1, 1967.

[2] Argentina, Uruguay, Cuba, Puerto Rico, and Chile.

outlays and inconvenience associated with using a method. Traditional methods of birth control are less reliable and less convenient than modern ones.[1] Where the range of alternatives is limited to traditional methods, large costs must be incurred to achieve a high degree of reliability, as in the extreme cases of continence and induced abortion. For the individual living in a "traditional" community, it may be very costly for him to search independently for a more reliable and a more convenient (modern) method of contraception, whereas for a society as a whole, informational costs are perhaps more modest per capita because of economies of scale in disseminating information. When contraceptive supplies are once wanted, accessible, and understood, their price may nevertheless exert a modest influence on their use, and therefore public subsidies may be critical for their rapid dissemination.

Policy

On the basis of the preceding analysis it appears sensible to view a population control policy as involving two basic elements -- distribution of birth control information and devices, and influencing family size goals. Until recently it often was argued that only a small proportion of the population in developing countries understood the feasibility of limiting births or wanted to. The studies described above, which show significant variation in birth rates associated with factors that could be expected to influence the desired birth rate, cast strong doubts on the assertion that few parents limit births. Other studies have indicated that, although parents almost always do exert a degree of birth control, in many cases they have more children than they want.[2]

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[1] Though pregnancy rates differ among populations practicing similar methods of contraception, largely because of differences in motivation and understanding, the greater reliability of modern compared with the traditional methods of contraception is on the order of 10 to 1.

[2] B. Berelson, "KAP Studies on Fertility," B. Berelson, ed., *Family Planning and Population Programs*, Chicago, University of Chicago Press, 1966.

These studies have found that many individuals have an interest in and curiousity about new methods for controlling births but that few have actual knowledge of these methods. It seems fair to conclude that existing channels for distribution have not reached the majority of parents demanding modern methods of familty planning. For the individual with limited regional mobility and little if any formal education, the costs of locating, evaluating, and effectively adopting a new method of birth control are large and have heretofore effectively barred his access to these innovations. It is typical to find contraceptive users more frequent among the better educated, higher social and economic groups in the developing countries, but scant evidence is found in the absence of a public family planning program that this innovation spreads rapidly through the society. Though it seems probable that upper classes are the first to feel the economic and social incentives to control and reduce their birth rates, the evidence from both historic and contemporary sources suggests that private diffusion of information on contraception is slow even when it is demanded at all social levels. The policy problem is to determine what characteristics of family planning services retard private diffusion of birth control information and what evidence there is that public action can accelerate the process.

Studies of the diffusion of innovations suggest a common pattern in which the better educated and informed are the first to distinguish a useful innovation and adopt it in advance of the vast majority of potential innovators. Gradually, but in increasing absolute numbers, others adopt the successful innovation as its value is demonstrated conclusively by growing use and the skill and ingenuity required for its use are reduced through standardization and routinization. But the time required for the diffusion process may vary a great deal depending on (1) the receptivity of the society to innovations, (2) the strength of customs that conflict with the innovation, (3) the ease of evaluating and acquiring the innovation, (4) the competitive pressure for suppliers to promote the adoption of the innovation, and (5) the competitive pressure for users to match the performance of others by adoption of the innovation.

For all these reasons new methods of birth control are likely to spread slowly. Though parents may be motivated to seek lower birth rates by the decline in child death rates, the increase in social mobility, and the rise in child rearing costs, societies through inertia may continue to pay lip-service to the "ideal" of high birth rates ingrained by long exposure to regimes of high mortality and low social mobility. Except for the better educated, who can evaluate innovations for themselves, open discussion of family planning and birth control may therefore be eschewed customarily, and information about the availability, practice, and reliability of birth control methods will remain unreliable and clouded by rumors. Because there is no outward evidence of innovative behavior in this sphere, progressive groups that adopt family planning do not set a distinguishable example for other segments of the society to follow.

Moreover, private market incentives to supply information on methods of birth control are not likely to yield sufficient results. Unless information is tied to a particular product or process that a supplier has an interest in selling, an information campaign is likely to have significant spillover effects, stimulating interest in and demand for a broader range of products and services than the supplier can satisfy. Because private suppliers cannot capture all the benefits of consumer interest in family planning, the social benefits associated with a promotional investment exceed the private profitability of promoting contraceptive innovations. Also, because of the social and political sensitivity of operations in this field, large diversified companies may not venture their reputation to capture a relatively small product market. In this environment, less than optimal amounts of private resources are allocated to disseminate information on family planning methods and services.

Historical evidence also casts doubt on the likelihood of rapid diffusion of contraceptive knowledge and use through private channels of communication and commerce; for it is well established that by the end of the 17th century birth control had taken root among the upper classes of European society, and nowhere did fertility decline on a

wide scale, except for France, before the mid 19th century. Though the attractions of having a large number of children may have diminished more rapidly among upper than among lower classes, it is nevertheless generally believed that practice of contraception among lower classes was retarded more by the inaccessibility of information than by lack of motivation.[1] Although it is reasonable that public support for the diffusion of family planning and contraception should hasten the process of its acceptance, it remains to be shown precisely how effective large scale public programs can be in accelerating the rate of diffusion and thereby narrow the differences in the rate of contraceptive use between high and low socioeconomic classes.

With most family planning programs in their initial stages, there are few data with which to answer this question. Surveys in Korea and Taiwan show that contraceptive use in all classes tends to increase with the start of a national family planning program, this increase being most noticeable among the lower classes.[2] The ratio of the rate of contraceptive use among high to low economic classes was equal to four before the program in the two Korean communities (Table 22). In Koyang where the more intensive program was mounted, the ratio fell to 1.07 in two years. In Kimpo it fell to 1.25. The nonfarmer/farmer ratio declined from two to less than one in Koyang. In Kimpo the fall was somewhat less. A wife with more than a primary education was four to five times more likely to be using some form of contraception before the program as her counterpart with no education. After the program this ratio was reduced to about two. In each case the reduction in the ratio was greater in the community where the more intensive public family planning program was launched.

The Taichung (Taiwan) data summarized in Table 23 confirm the same consequences of the public family planning program as those traced

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[1] J. Sutter, "The Action of Birth Limitations on Genetic Composition of Populations," in conference on *Fertility and Family Planning, a World View*, University of Michigan, 1967.

[2] It is actually quite striking that the highest IUD acceptance rates being recorded in Korea are among farming communities of low literacy.

Table 22

RATIO OF CONTRACEPTIVE USERS IN VARIOUS CLASSES BEFORE AND AFTER A PUBLIC FAMILY PLANNING PROGRAM IN TWO KOREAN COMMUNITIES

User Ratio	Koyang (intensive program) Before	Koyang (intensive program) After	Kimpo (only national program) Before	Kimpo (only national program) After
High to low economic status	4.40	1.07	4.17	1.25
Nonfarmer to farmer	2.00	.95	1.70	1.44
Wife's education -- primary school plus to none	5.25	1.82	4.14	2.40
For All Women				
Percent using some form of contraceptive	8	38	12	17
Percent using more reliable form of contraceptive[a]	2	29	4	11

Note:
[a]Condom, sterilization, and IUD.

Source:
Sook Bang, "The Koyang Study: Results of Two Action Programs," *Studies in Family Planning*, No. 11, April 1966. Table derived from data of Table 7, p. 8.

Table 23

RATIO OF WOMEN AGE 20 TO 39 EVER USING CONTRACEPTION PRIOR TO A PUBLIC FAMILY PLANNING PROGRAM, AND RATIO ACCEPTING A METHOD OF CONTRACEPTION IN PROGRAM IN TAICHUNG, TAIWAN BY DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

User Ratio	Ever Used Means of Family Limitation Before Program, 1962	Acceptance Rate in Program by July 31, 1965	
		Regular Program	Intensive Program
Number of live births or living children -- five or more to none	3.67	7.66	10.00
Wife's education -- senior high school graduate to less than primary	5.08	1.28	1.13
Husband's education -- senior high school graduate to less than primary	4.36	1.50	1.24
Husband's occupation -- white collar-professional to farmer	5.36	1.35	1.08
Household income -- NT $2,500 or more to less than NT $1,000	2.59	1.07	1.00

Source:

John Y. Takeshita and Ronald Freedman, "Who Accepts Family Planning Services: Demographic and Social Characteristics of the Acceptors," University of Michigan Population Studies Center, draft chapter of forthcoming book, October 20, 1966, and tables to Chapter II of same book. Derived from data in Table A-3.

in the two Korean towns.[1] The frequency of contraceptive use before the program was launched in 1962 was about four to five times greater among high school graduates than among those with less than a primary education (education of either husband or wife). After exposure to the program in 1965 those accepting contraception were only 1.1 to 1.5 times more frequent in the higher education group than in the lower. When families were divided into high and low income classes, the ratio of contraceptive use fell from 2.6 to 1.0 in the more intensively covered regions of Taichung. Just as the ratio of contraceptive use among disparate economic and social classes diminished with the intensity of the public family planning program, the ratio of contraceptive use among couples with five or more children to couples with no children increased from 3.8 to an acceptor ratio of 10.0 in the regions subjected to the more intensive program.

Freedman and Takeshita confirm this pattern by other statistical methods that show that social and economic characteristics of the respondents are more helpful in predicting contraceptive use before the program than in predicting acceptors from the sampled population after the program had been in operation.[2]

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[1]For our purposes the Taiwan data are not exactly comparable to those for Korea, but because they are based on larger samples and include greater detail they deserve attention. The pre-program study refers to contraceptive use, and the latter survey reports only those who accepted contraceptives in the program, omitting persons who continue to use their own means and thus are not "acceptors." It therefore appears that the ratio of contraceptive users after the program was launched in 1965 would actually fall somewhere between the initial ratio of users and the final ratio of acceptors (both given in Table 23). As in the Korean case, in every instance the more intensive program brought the ratio of acceptors among social and economic classes closer to unity.

[2]A multivariate linear relationship is assumed to exist between a variety of economic, social, and demographic features of the respondent and her use of some form of contraception before the family planning program and her acceptance of some form of contraception in the program. Freedham and Takeshita found that the wife's education, husband's occupational status, and household income with six other socioeconomic variables helped to explain 18 percent of the variance in contraceptive use before the program among the women aged 30 to 39. But these same variables accounted for only one percent of the variance

From two of the largest and best organized family planning programs (Korea and Taiwan) there is evidence that these programs have both accelerated the diffusion of contraceptive knowledge and practices and equalized the frequency of contraceptive use among diverse social and economic classes within a remarkably short span of two years. The advantage enjoyed by the better educated, wealthier, and urban couples in being able to evaluate and adopt this innovation was quickly extended to all classes by public family planning services. The ability of these public programs to penetrate all segments of society regardless of their innovative advantages is a powerful argument for direct public action in this field rather than exclusive concentration on indirect public subsidies to private commercial channels of information and distribution. In all probability the latter policy would maintain class differentials in access to, and use of, modern contraception.

Given that many families are having more children than they want, programs to increase access to modern birth control methods can have a rapid and powerful impact. There is good reason to believe that this condition also obtains in Colombia. Published survey findings are available only for Bogota in 1964, but other fragmentary evidence suggests the situation is more acute today in less metropolitan areas of Colombia.[1] About two-thirds of the Bogota women interviewed in marital unions reported they wanted no more children. In the United States the proportion is one-half; in Taiwan it is only 45 percent.[2] There was a general receptivity among all classes for the adoption of birth control, and a majority regarded the lack of money as an acceptable reason for preventing additional births. The completed family

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in acceptance in the program. On the other hand, the demographic variables such as the number of living sons and daughters, and the number of children alive and wanted, explained 13 percent of the variance in program acceptance. The authors conclude, "Clearly, the social variables are much more important in relation to prior use of contraception than in relation to acceptance in the program." Takeshita and Freedman, *"Who Accepts Family Planning Services."*

[1] Alfredo Aguirre, "Colombia: The Family in Candelaria," *Studies in Family Planning*, No. 11, April 1965.

[2] B. Berelson, "KAP Studies on Fertility," in B. Berelson, ed., *Family Planning and Population Programs*, Figure 2, p. 659.

size in Bogota implied that parents were having on the average 4.8 children; the expressed "ideal" number of children was 3.6. Consistent with the evidence from Taiwan and Korea, contraceptive use was more frequent among the upper classes. As seen in Table 24, better educated women were more likely to have used some form of contraception. They were also more likely to have used a modern, reliable method. The better educated wife both sought fewer births and managed better in achieving her "ideal" than the less educated.[1] Most of the unwanted births in Bogota are apparently to families where the mother has had less than a primary education, and it is toward this group that a publically supported family planning program must be aimed if equal access to modern methods of birth control is to be assured for all parents and birth rates are to fall substantially.

But there is no reason why population policy must stop with birth control. The studies described earlier indicate that it is possible to influence the birth rate by influencing the number of children people want to have. For example, Enke has suggested tax transfer schemes aimed at preventing births.[2] Although his arguments seem fallacious, there is an economic argument for such a transfer tax. For in addition to the direct costs of children to the family, the society as a whole also bears costs in the form of education, health, and welfare services that children consume. Although the average taxpayer is also a parent, without user fees the individual parent's tax is unrelated (or perhaps negatively related) to his children's use of these government supplied services. An efficiency argument may be made for transferring these social costs to the parent.

A policy of directly charging parents for their children's consumption of public services would discourage the purchase of such services by the poor, however. This is inconsistent with the social objective of fostering rather than discouraging the use of health and

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[1]Rafael Prieto Duran and Roberto Cuca Tolosa, *Analisis de la encuesta de fecundidad en Bogota,* Monografia No. 19, Centro de Estudios Sobre Desarrollo Economico (CEDE), Bogota, 1966, Table 355A.

[2]S. Enke, "The Economic Aspects of Slowing Population Growth," *Economic Journal,* March 1966.

Table 24

IDEAL AND ACTUAL FAMILY SIZES AND CONTRACEPTIVE USE, BY WIFE'S EDUCATION, BOGOTA, 1964

Wife's Educational Attainment	"Ideal" Number of Children All Minors[a]	Actual Number of Live Births All Unions[b]	Percent of Catholic Women Ever Having Used Contraceptives[c]
No schooling	4.5	5.3	14.6
Some primary	4.3	3.9	28.2
Primary graduate	3.8	3.8	39.7
Some secondary	4.0	3.6	59.5
Secondary graduate	4.1	3.6	74.0
University	3.9	1.8	70.0
All women	4.2	3.9	39.4

Notes:

[a]Estimated from Rafael Prieto Duran and Roberto Cuca Tolosa, *Analisis de la encuesta de fecundidad en Bogota,* Monografia 19, Centro de Estudios Sobre Desarrollo Economica (CEDE) Bogota, 1966, Table 151.

[b]*Ibid.*, Table 11.

[c]C. Miro, "Some Misconceptions Disproved," in B. Berelson, ed., *Family Planning and Population Programs,* Chicago, University of Chicago Press, 1966, Table 13, p. 629.

educational services by the lower income classes. Moreover, until knowledge of modern methods of birth control is virtually universal, it seems ill advised to penalize those who are least able to alter their circumstances. Thus, although it may be argued on efficiency grounds that parents should absorb the costs of public services their children will consume, a birth tax generates inequitable side effects, particularly if modern birth control has not percolated through all strata of society. A transfer payment to parents for avoiding children equal to the present discounted value of the social services their child is likely to consume may be a preferable mechanism for rationalizing this aspect of public-private population policy without significantly altering the existing redistributional function of the tax expenditure system.[1]

Although an argument can be made for a direct payment to families for not having children, it is possible, and in many ways more attractive, to try to influence the desired birth rate indirectly. In particular, three aspects of the parent's environment might be managed to provide an incentive for a reduction in fertility.

First, the opportunity cost of child rearing might be increased. A large part of the cost of children is the value of a mother's time spent with them. Industrial policy and labor legislation may facilitate or inhibit greater labor force participation by women. Second, labor force participation by children could be reduced. It is both unreasonable and uneconomic to expect that the less developed countries would have much success in imposing child labor laws to reduce the productive services that parents derive from their offspring, but

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[1] One difference between the tax and transfer scheme would be that parents who had already decided to avoid having additional children would nevertheless receive a transfer payment as an economic rent. Some detail in graduating the size of transfer payments according to the likelihood that parents of a certain age, parity, and open birth interval would have additional offspring could substantially reduce the size of these rents, however. Another difference between the tax and transfer system would be that the tax system would generate additional government revenues while the transfer system would be costless for the government (if rents were eliminated and if the discount rate used to compute the size of the transfer payment were equal to the cost of current government borrowing).

expanding school facilities might lead to this result. Third, a reduction in birth rates might be induced through an improvement in the chances for child survival. Data from both Taiwan and Puerto Rico suggest that a reduction in child mortality will ultimately lead to an even larger reduction of fertility such that the net effect is a reduction of the rate of population growth.[1]

Mortality among children in Colombia has decreased markedly with the control of some infectious and microbial diseases, but childhood deaths are still much more common than in developed countries. Infant mortality is several times greater than in any advanced country, and death among preschool children (age 1 to 7) is probably 20 times greater. Protein-calorie malnutrition is thought to be responsible for much of the high death rate in Latin America by contributing to the susceptibility of children to the pneumonia-diarrhea complex of diseases. Essentially nonmicrobial, these diseases are not readily controlled by modern medical technology without a prior improvement in the child's diet and home environment.

Since child spacing is a subtle form of family planning that is uncommon in less developed countries, most persons seeking birth control methods already have the number of living children they want. Consequently, the demand for birth control and the subsequent decline in birth rates should lag ten to fifteen years behind the decline in child death rates and be most noticeable among women 30 years or older. Because of the reduction in child mortality that has already occurred in Colombia one might expect that a large number of the women reaching the age of 30 to 35 in the 1960s will desire the means to avoid additional births. The evidence from Bogota supports this conjecture. After the birth rate has once begun to decline there will be a potentially fertile group of women controlling their fertility through reliable means of birth control, and fluctuations in child mortality may then become more closely associated with (replacement) fluctuations in birth rates. Where means of reliable contraception remain difficult

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[1]T. Paul Schultz, *Population Growth: Investigation of a Hypothesis*, The RAND Corporation, P-4056, March 1969.

to secure, abortion and dissolution of marital unions may become more frequent than is already evidenced in Colombia.

If this reasoning is sound, some reduction in fertility in such countries as Colombia is likely in the 1960s, and family planning programs may facilitate this process by providing parents with humane and safe methods of preventing unwanted births. But to achieve a much lower level of fertility many more parents must find the objective of a smaller number of children more attractive than they do now. If society places a high priority on slowing population growth it must be willing to expand those health, education, labor, and welfare programs that will promote selected changes in the social environment and induce more parents to scale down their family size goals. Such a change in attitudes need not follow in the wake of urbanization and a general industrialization effort. Government programs and policies could make specific contributions by strengthening the incentives and improving the opportunities for women to find employment outside of the home, in fostering more universal school attendance, and by allocating more resources to health and welfare programs that seek primarily to eliminate the causes of infant and child mortality.