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A FINANCIAL COMPUTABLE GENERAL EQUILIBRIUM MODEL FOR THE ANALYSIS OF ECUADOR'S STABILIZATION PROGRAMS

by

André Fargeix and Elisabeth Sadoulet

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RÉSUMÉ

Ce document présente l'application à l'Equateur d'un modèle d'équilibre général calculable qui comprend un secteur financier, dans la ligne du modèle macro-micro proposé par F. Bourguignon, W. Branson et J. de Melo dans le document technique no.1 "Macroeconomic Adjustment and Income Distribution. A Macro-micro Simulation Model".

Au préalable, les auteurs décrivent la crise qui a touché l'Equateur, les programmes de stabilisation exécutés par les gouvernements et les conséquences économiques de ces programmes avant de présenter le modèle et la base de données correspondante. Puis les résultats de trois simulations en dynamique sont exposés. La première ne suppose aucun ajustement ; la seconde que l'ajustement consiste seulement en une réduction de toutes les dépenses publiques ; la troisième qu'il se fonde sur une diminution de la croissance de la masse monétaire. Dans chaque cas, les effets sur la croissance, sur les déséquilibres et sur la distribution des revenus sont mis en évidence. Enfin, une analyse de sensibilité permet d'estimer l'impact de structures économiques différentes sur les résultats des simulations.

SUMMARY

This paper presents an application to Ecuador of a computable general equilibrium model with a financial component, following the lead of F. Bourguignon, W. Branson and J. de Melo. Their macro-micro model was introduced in Technical Paper No.1 "Macroeconomic Adjustment and Income Distribution. A Macro-micro Simulation Model".

The authors first review the crisis of the Ecuadorian economy, the stabilization programmes that were implemented by governments and the economic effects of these programmes. Then the model and the corresponding data base are presented and used to perform three dynamic simulations. In the first case, there is no adjustment; in the second simulation, all public expenditures are reduced by the same percentage; and in the third simulation, the annual growth in money supply is reduced. For each simulation, the authors display the effects on growth, imbalances and income distribution. Finally a sensitivity analysis has been undertaken in order to assess the impact of alternative economic structures on the results of simulations.

PREFACE

In January 1987, the Development Centre launched a research project on "Adjustment Programmes and Equitable Growth" to investigate the negative consequences of these programmes. Experience shows that adjustment programmes often provoke hostile reactions which make it difficult to implement them.

Under these circumstances it is useful to seek answers to the following questions: can other programmes be designed which would have the same stabilising effect, but less negative social consequences? and are the effects less detrimental to the poor if adjustment is carried out earlier, rather than later?

Only a counterfactual analysis carried out with a model makes it possible to estimate the economic and social effects of stabilisation while distinguishing between the effects of adjustment and of prior recession. For this reason, the Development Centre asked F. Bourguignon, W. Branson and J. de Melo to construct a model which combines, for the first time, the microeconomic characteristics of a computable general equilibrium model with a macroeconomic model including a financial sector, making it possible to take into account all the aspects of a stabilisation programme. This model, presented in Technical Paper No.1: "Macroeconomic Adjustment and Income Distribution. A Macro-micro Simulation Model", was applied to Morocco by C. Morrisson for the 1980-86 period. The results of this application were presented in Technical Paper No. 7: "Ajustement et distribution des revenus : application d'un modèle macro-micro au Maroc".

Along the same lines as the model developed by F. Bourguignon, W. Branson and J. de Melo, a computable general equilibrium model with a financial sector was constructed by A. Fargeix and E. Sadoulet and applied to Ecuador for the 1980-86 period.

After a review of the conditions in which the crisis developed, the stabilisation programmes implemented and their economic consequences, the authors present their model and the basic data for Ecuador. Subsequently, they present the results of three simulations: if adjustment does not take place; if adjustment is limited only to a reduction in public expenditures; or if a break is put on the growth of the money supply. For each simulation, the effects on growth, imbalances and the evolution of the income of each socio-economic group are indicated; the model estimates both the variations in primary income and social services available to households.

With no adjustment, the loss of foreign exchange leads to a sharp devaluation of the currency which benefits agricultural households while hurting urban homes. Among these urban classes, the medium and rich are the main losers because real wages and employment decline whereas poor people are sheltered by the informal sector.

With a reduction of public expenditures, the main losers are again the same urban classes because public sector employment is cut, but poor urban and rural

non-agricultural households lose also from reduction in access to education and health services provided by the public sector.

Socially, a monetary adjustment has a more neutral effect on the distribution of income than a fiscal policy. Lower real exchange rate devaluation benefits the large farmers less and does less damage to urban consumers. Urban households benefit from higher real wages, due to falling inflation, and from higher employment in the public sector. In this respect, monetary adjustment affects middle-income and wealthy urban households less than a budgetary adjustment.

These simulations are complemented by a sensitivity analysis in order to see if the results are modified when the value of certain parameters changes, whether the impact of inflation on investment is slight or considerable for example. It was found that the effectiveness of monetary adjustment diminishes if investment and capital flight are very sensitive to inflation.

This study, as well as the Moroccan case study, shows that the use of this kind of model provides very useful information about the social impact of adjustment programmes and makes it possible, for the first time, to answer the questions of interest here.

Louis Emmerij
President of the OECD Development Centre
January 1990

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André Fargeix and Elisabeth Sadoulet
Department of Agricultural and Resource Economics
University of California
Berkeley, CA 94720

I. Introduction

Before the 1970's, Ecuador was a largely agrarian economy with a typical Latin American dual sector structure composed of food producing peasants and agroexport and livestock producing haciendas and plantations. With the discovery of oil in the early 1970's and the subsequent sharp rise in oil prices, this traditionally agrarian economy engaged in a massive program of import substitution industrialization and structural transformation under conditions of real exchange rate appreciation created by a booming export sector. This resulted in a decade of exceptionally rapid economic growth with large-scale investments in public goods and services, expansion in the state apparatus, rapid employment creation in industry and the nontradable sectors, and massive migrations to the urban sector while agriculture, and particularly food production, stagnated.

Economic success was, however, followed by dramatic decline as the economy was exposed to severe shocks to its foreign sector between 1981 and 1983 that originated with a combination of falling oil prices and the outbreak of the debt crisis. Since the economy was highly dependent on foreign exchange revenues, and since the phase of import substitution industrialization had barely been started, these shocks were highly destabilizing and required a massive adjustment in the economy. This led Ecuador to implement a stabilization program in 1982-1985, the analysis of which is the object of this paper.

We analyze this stabilization program and a set of alternative policies which could have been followed by constructing a Computable General Equilibrium (CGE) model with both real and financial components following the leadership of Bourguignon, Branson, and de Melo (1988). Because stabilization programs involve financial phenomena such as the reduction of the rate of inflation and the adjustment of interest rates, inclusion of a financial sector in the standard real-side CGE is necessary to provide the possibility for experimentation with the policy instruments that affect these financial variables which was not possible with standard CGEs. In analyzing the Ecuadorian stabilization program, we have two specific objectives:

1. While comprehensive household surveys were conducted in 1975-76, there is no comparable second observation available that can be used to measure the effects of the shocks and the stabilization policies on the welfare of different segments of the

population. Indirect indicators such as the levels of wages and employment, value added in different sectors, and household-specific price deflators can be used to approximate income changes, but this fails to capture the mix of effects on specific households and these households' responses to prices. Construction of a CGE model is consequently necessary to simulate, ex post, the historical effects of the crisis and stabilization policies on real incomes. This is important in order to assess who is currently paying the welfare costs of adjustment, what are the instruments that could be used to eventually alleviate these burdens, and at what aggregate economic cost.

2. In accordance with the traditional International Monetary Fund (IMF) approach to stabilization, the programs implemented in 1983 and 1985 included a severe attack on inflation through the use of fiscal and monetary instruments. We advance here the thesis that more important than the control of inflation is the reduction of the fiscal deficit through the use of fiscal policies which are essential for investment protection and long-term economic recovery, even if this is done at the cost of a continuous inflation fueled by exchange rate devaluation. Monetary policy can only be useful as a complement to fiscal policies, in order to prevent the negative long-term effects of inflation on investment and capital flight. On the other hand, fiscal policies are more difficult to implement and, as they have a very specific negative impact on the urban middle and rich population, more subject to political attack. This may explain the tendency for an excessive use of monetary instruments in stabilization policies.

In the remainder of the paper, we first review the nature of the crisis, the stabilization programs that were implemented, and the consequences of these programs (Part II). We then construct a CGE model with real and financial sides (Part III) and present the corresponding database (Part IV). In Part V, we use this model to perform dynamic simulations of different approaches to stabilization and assess their implications in terms of growth and inflation and income distribution. Finally, in Part VI, sensitivity analysis is performed to assess the impact of alternative economic structures on the solution of the model.

II. Ecuador's 1982-1985 Stabilization Program

During the decade of the 1970's, Ecuador enjoyed an exceptional period of economic growth, fueled in large part by oil revenues after the discovery of petroleum in the Amazon basin (large-scale production started in 1973) and the successive rises in oil prices. With foreign exchange and fiscal revenues from oil, the government implemented a policy of import substitution industrialization with explicit as well as implicit subsidies stemming from high exchange rate and trade restriction. At the same time, the government started an ambitious investment program in basic infrastructure, education, health, and other social services. In the early 1980's, as oil production started to stagnate, the government turned toward foreign borrowing to finance its increasingly large deficit.

Explosion of the debt crisis in 1982, however, put an end to the 10-year economic boom and led to dramatic changes in Ecuador's economy. As foreign funds

dried up, beginning in mid-1982, the government was faced with the dual problem of financing the public deficit and avoiding a deterioration of the balance of payments situation. At first, the government's policy aimed solely at stabilizing the balance of payments by devaluing the exchange rate and introducing drastic import prohibitions. In order to help mobilize domestic financial resources, which were drained by the growing public deficit, the government raised domestic interest rates by an average of 4 percentage points. This measure contributed to an increase in the central bank's resources by stimulating private deposits. However, this was not enough to cover the increase in the central bank's credit to the government required by the lack of public deficit financing from abroad. Hence, the Central Bank had to finance part of the deficit by money creation. As the public deficit grew larger and inflation started to rise, it was clear that these measures were insufficient and that a more complete policy package had to be introduced.

This led the government to implement a stabilization program under a stand-by arrangement with the IMF starting in July, 1983. Following the March, 1983, devaluation of the sucre to S/ 42 per U. S. dollar, a series of mini devaluations, equivalent to 3 percent per month, were announced. The stand-by arrangement required a policy of fiscal as well as monetary austerity, with limits on domestic credit to both government and the private sector.

The stabilization measures were successful in terms of fiscal deficit (which was reduced from 4.8 to 2.5 percent of GDP) and of disequilibrium in the balance of payments (the current account deficit was reduced to 1 percent of GNP). These improvements, however, were obtained at the cost of a serious economic recession (minus 3 percent GNP growth), a rising rate of unemployment, and falling real wages. Despite the constraint on monetary growth, inflation accelerated to 48 percent in 1983 as a consequence of rising imported good prices, associated with the devaluations, and rising agricultural prices resulting from flood-induced food shortages.

When the government of President Febres Cordero assumed power in August, 1984, the shift to a neoliberal economic model took its more systematic form. The Industrial Incentive Law, passed in early 1985, brought a series of measures for trade and price liberalization. The emergency import controls introduced in 1982 were removed. Most administered prices in agriculture were freed, and domestic fuel prices and electricity tariffs were increased. The government took steps to encourage direct foreign investment, especially for petroleum exploration and production. Domestic interest rates were increased again: the deposit rate was raised to 18 percent in mid-1984 and 20 percent at the beginning of 1985.

The shift toward a liberal economic policy was pursued under the second one-year IMF stand-by arrangement approved in March, 1985. Most of the private sector foreign transactions still under the official exchange rate regime at the end of 1984 were transferred to the more depreciated intervention market in several steps during 1985. However, complete unification, which had been scheduled to take place before May, 1985, was achieved only in November with an induced devaluation from S/ 66.50 per U. S. dollar to S/ 95.00 per U. S. dollar. The sucre was further devalued in February, 1986, to S/ 108.5 per U. S. dollar.

The second IMF arrangement called for continued public sector austerity and set ceilings for domestic credit to the public sector. The government maintained a roughly constant level of expenditures, and raised revenues, in part by increasing several public utilities rates. The ceiling on credit to the public sector was well respected, and the public sector enjoyed a substantial budget surplus (2 percent of GDP) in 1985. The arrangement also asked for slow monetary growth, by setting a ceiling on net domestic assets, and liberalization of the financial sector with the creation of a new savings instrument (certificate of deposit) with market determined interest rate.

In Table 1, we summarize the characterization of the stabilization policy with four main policy instruments that will be used in the model: real exchange rate adjustment, fiscal policies directed at current and investment expenditures, monetary policy, and wage repression. Exchange rate depreciation has been the instrument earliest and most systematically used throughout the period. Implementation of fiscal policies applied mostly to capital expenditures, while current expenditures (net of interest payment) stayed relatively stable in percent of GDP. As a consequence, the government budget went from a large deficit (4.5 percent of GDP in 1982) to a slight surplus in 1985. The implementation of monetary policies is characterized by the money supply M2 as a share of GDP, domestic credit as a share of GDP, and the share of total domestic credit going to the public sector in order to capture the eventual crowding out of private by public investment. The implementation of monetary policy has been very light compared to the adjustment made in many Latin American countries. They also were delayed compared to the fiscal policies, which also ran contrary to what has been observed in many Latin American countries. Money supply only slightly decreased in percent of GDP. The application of restrictive credit policy started in 1984 only, and consisted of a complete stop of the very rapid growth of credit that had occurred previously. Most of the adjustment has been borne by the private sector whose credit gradually declined as a share of GDP.

Some indicators of performance of the Ecuadorian economy also are reported in Table 1. The successive programs succeeded in reducing inflation to 30 percent in 1984, 28 percent in 1985, and 23 percent in 1986. The balance of payments deficit was also drastically reduced. The adjustment was also relatively successful in restoring a certain rate of growth after two years of recession, in particular, in the more tradable agricultural sector. But this has been accomplished at the cost of a drastic cut in investment which can only limit future growth potential.

This reading of the Ecuadorian economic performance cannot, however, be used as a direct measure of the outcome of the stabilization policies, since many more reforms were jointly implemented, including a succession of liberalization and protection phases in the exchange rate and trade policy, reform of the financial system and fiscal reforms, and because the economy has also been subject to recurrent external shocks during the period. This is indeed what motivated the use of a simulation model to disentangle the impact of these specific policies with the other factors.

Table 1 - Macreconomic Adjustment in Ecuador, 1975-1987

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Adjustment Policy Indicators													
Real Exchange Rates	n.a	97.8	100.9	99.4	98.6	100.0	111.8	109.4	104.1	86.0	89.3	71.9	55.3
Fiscal Policy: Central Government Budget													
Current revenues (% GDP)	8.4	14.7	13.5	12.9	14.3	12.8	11.3	11.0	10.7	12.3	17.0	13.8	14.9
Total expenditures (% GDP)	8.7	16.3	16.1	14.0	18.1	14.3	16.1	15.5	13.2	13.1	15.1	15.8	19.6
Interest payments	0.4	0.7	0.7	0.9	2.0	1.3	2.0	2.9	2.6	n.a	3.2	2.7	3.5
Current exp. net of interest payments	5.2	9.7	9.4	8.5	12.1	10.7	10.9	9.9	8.3	n.a	8.8	10.1	11.7
Capital expenditures	3.1	5.9	6.0	4.6	4.0	2.4	3.2	2.7	2.4	2.1	3.0	2.9	4.4
Deficit (% GDP)	-0.3	-1.6	-2.6	-1.1	-3.8	-1.5	-4.8	-4.5	-2.5	-0.8	1.9	-2.0	-4.7
Monetary Policy													
Share of foreign borrowing in government total borrowing	33.3	12.5	50.0	209.1	-15.8	33.3	42.3	53.3	-16.0	-62.5	15.8	72.1	30.4
Credit													
Total domestic credit (% GDP)	18.9	18.9	18.2	17.6	19.8	20.1	22.0	25.7	30.3	26.7	32.3	30.3	30.1
Credit to private sector (% GDP)	18.5	18.2	18.3	19.5	20.7	21.4	24.3	26.3	32.3	31.6	28.4	26.4	24.6
Credit to public sector (% GDP)	0.3	0.7	-0.1	-1.9	-0.9	-1.3	-2.2	-0.6	-2.0	-4.9	3.9	3.9	5.5
Money supply M2 (% GDP)	21.4	21.7	21.6	20.8	22.3	22.6	21.7	22.5	21.1	20.8	20.0	20.0	22.3
Social Indicators													
Real minimum wage					55.0	100.0	88.7	79.2	84.7	74.0	70.3	72.7	n.a
Public social expenditures													
Education expenditures (% GDP)	3.1	4.6	4.5	4.3	3.9	5.3	5.4	5.1	4.5	4.1	3.7	4.1	n.a
Education expenditures (per capita)	49.5	77.8	78.8	77.9	72.2	100.0	102.9	95.6	79.6	73.5	67.3	74.7	n.a
Health expenditure (% GDP)	0.8	1.4	1.5	1.8	1.6	1.8	2.1	2.2	2.0	1.9	1.1	1.1	n.a
Health expenditure (per capita)	37.6	69.8	77.3	96.0	87.3	100.0	117.8	121.4	104.2	100.3	58.9	59.0	n.a
Economic Performance													
GDP growth	5.6	9.2	6.5	6.6	5.3	4.9	3.9	1.2	-2.8	4.2	4.3	3.2	-5.2
GDP at factor costs (index 1980=100)	73.1	80.5	85.1	90.4	95.7	100.0	105.1	106.6	104.7	109.1	113.7	117.4	111.1
Agriculture	91.2	93.8	96.0	92.3	95.0	100.0	106.8	109.0	93.8	103.8	114.1	125.6	134.9
Manufacturing	64.2	72.7	81.3	88.0	96.5	100.0	108.8	110.4	108.9	106.8	107.1	105.3	105.5
Services	69.4	75.6	82.5	88.2	92.9	100.0	103.2	105.4	101.0	104.3	107.2	109.7	112.4
CPI inflation	14.3	10.2	12.9	13.1	10.1	12.8	14.7	16.4	48.1	30.4	28.0	23.0	30.4
Open urban unemployment	n.a	n.a	n.a	n.a	5.4	5.7	6.0	6.3	6.7	10.5	10.4	12.0	12.0
Investment (share of GDP)													
Public investment	5.9	6.6	5.9	6.2	5.3	6.4	7.3	6.5	4.8	4.4	4.9	5.8	6.1
Private investment	17.3	15.6	17.7	20.0	18.4	17.2	14.9	16.1	11.8	11.0	11.2	12.6	17.0
Balance of payments (million of US dollars)													
Trade balance	7	259	40	-175	54	278	174	140	927	1055	1294	555	-33
Current account balance	-220	-7	-342	-701	-625	-642	-993	-1201	-134	-263	114	-548	-1175

Source Inter-American Development Bank, Economic and Social Progress in Latin America
Ecuador, National Accounts

III. The CGE Model: Real and Financial Sides

3.1. Financial Sector Overview

The present model integrates a neoclassical general equilibrium model into a complete macroeconomic framework. This framework is based on an IS-LM model of the economy where, for a given price level, the savings-investment imbalance is cleared by the rate of interest. This IS-LM model determines the level of aggregate demand, while aggregate supply follows a neoclassical specification where supply depends inversely on the real wage. It is assumed, however, that nominal wages are "sticky" in the short run, the unemployment rate can differ from its natural rate. Wages adjust in the long run following an "inflation augmented" Phillips curve $\frac{dw}{dt} = f(U) + \hat{\pi}$, where U is the rate of unemployment and $\hat{\pi}$ the expected rate of inflation. The function f satisfies $f(\overline{U}) = 0$, where $\overline{U}$ is the natural rate of unemployment and takes positive values for $U < \overline{U}$ and negative values for $U > \overline{U}$. Complemented with an adaptive type of expectation formation, this macroeconomic model implies that both fiscal and monetary policies can have a short-run impact on economic activity and on employment. In a steady state with constant growth of money supply, agents will anticipate the correct rate of inflation, and the real wage will adjust to bring the unemployment rate back to its natural rate (the Phillips curve implies that, with $\hat{\pi}$ equal to actual inflation, real wage will decrease if there is excess unemployment and increase if there is excess labor demand). Consequently, the steady-state level of economic activity is unaffected by the growth of the money supply (see Sargent (1982), Chapter 5 for a dynamic analysis of this type of model). Monetary policy can bring a permanent increase in the level of economic activity only with an infinitely accelerating growth of the money supply, with the consequence of an infinitely rising inflation.

The financial sector's specification follows the approach of Tobin (1969) where households make decisions on consumption and savings on one hand and on the allocation of their accumulated savings (or wealth) between various assets on the other hand. The present model extends that approach by allowing the existence of two domestic financial assets (money and interest bearing accounts) and one foreign asset. These assets are considered imperfect substitutes because of their risks and their degree of liquidity, although the source of this imperfect substitutability is not explicitly modeled.

The various assets and liabilities held by the institutions of the economy can be summarized in the institutions' balance sheets (Table 2). For each institution, the sum of assets is equal to the sum of liabilities. Although no market exists for all assets, all assets are assumed to have a price with which they can be valued, generally taken as their replacement cost during the current period. For instance, capital stock is valued at the current price of capital, stocks of commodities at the current price index, foreign exchange at the current exchange rate, and bonds at their face value. Consequently, each institution's "accumulated savings" includes the sum

Table 2: Balance sheet of the institutions

Assets		Liabilities	
Government			
Capital stock	$PK_g K_g$	Central Bank credit to government	DC_g
Equity held	EQ_g	Domestic borrowing	BD_g
Stocks	ST_g	Foreign borrowing	$ER\ BF_g$
		Accumulated savings	AS_g
Central Bank			
Central Bank credit to government	DC_g	Currency	CU
Foreign currency reserves	$ER\ FF$	Required reserves	RR
Direct credit to private sector	DC_p	Accumulated savings	AS_{cb}
Commercial Banks			
Required reserves	RR	Demand deposits	DD
Loans	BD	Time deposits	TD
		Accumulated savings	AS_b
Firms			
Currency	CU_f	Domestic borrowing	BD_f
Demand deposits	DD_f	Foreign borrowing	$ER\ BF_f$
Stocks	ST_f	Accumulated savings	AS_f
Capital stock	$\sum_i PK_i K_i$	Equity	EQ_f
Households			
Currency	CU_h	Accumulated savings	AS_h
Demand deposits	DD_h	(i.e wealth WE_h)	
Time deposits	TD_h		
Foreign currency	$ER\ F_h$		
Equity	EQ_h		
Rest of the World			
Foreign loans	$ER\ BF$	Foreign currency	$ER\ FF$
		Accumulated savings	AS_r

of all savings from the institution's current account accumulated over time as well as capital gains and losses on assets and liabilities.

Households can invest their wealth into capital (equity participation in firms) and three financial assets: money, interest bearing time deposits, and foreign bonds, with the share of wealth allocated to each asset depending on their respective real yields. Money is further assumed to be held in constant proportion between currency and demand deposits. Households' domestic financial assets are deposited into the commercial banks, which in turn lend all available funds on the domestic loan market. Firms borrow both on the domestic and international markets to finance their credit needs, with a share of each type of loan depending on the real interest rate on each loan. Assets held by firms are the stock of capital, inventories, and working capital. Working capital is held in forms of money, with a constant currency-deposit ratio like the households. Consequently, their stock of credit need is the sum of their assets minus equity participation (from households) and accumulated retained earnings. As for the government, its assets consist of its stock of capital (accumulated public investment) and its equity participation in firms. These assets are covered by the government's accumulated savings and public borrowing. Borrowing comes from three sources (borrowing on the domestic market, foreign borrowing, and direct credit from the Central Bank), whose respective shares are considered policy variables.

The financial decisions of the households, firms, and government are reconciled through a financial system, composed of the Central Bank and the commercial banks. The financial system determines the supply of money and domestic loans in the economy. Money is composed of currency CU, issued by the Central Bank, and demand deposits DD in commercial banks. The Central Bank receives from the commercial banks the required reserve RR with a reserve requirement re on demand deposits. Assuming a constant currency-deposit cu for all institutions holding money, the supply of currency and demand deposits can be summarized in a supply of money $MS = CU + DD = mm\ MB$, where $mm = \frac{cu + 1}{cu + re}$ is the money multiplier and $MB = CU + RR$ the monetary base. The monetary base is equal to the central bank's assets net of capital gains (on foreign assets). The central bank's assets are foreign exchange reserves, direct credit to the government, and direct credit to the private sector. Credit to the private sector consists mainly of special, subsidized lines of credit aimed at encouraging some types of investment; it will be kept constant in real terms during the simulations.

Domestic loans are supplied in part by the Central Bank as described above and in part by the commercial banks. Commercial banks' availability of funds comes from the deposits of households and firms, from their own savings, and from direct equity participation from households. Domestic loans then will be the difference between these funds and the reserves that the commercial banks are required to hold, in the form of deposits, in the Central Bank. The amount of domestic loan thus depends on the reserve requirement ratio imposed by the Central Bank.

Most of the specific equations of the model described below combine in a very direct way this general approach with the traditional CGE modeling. Before turning to their detailed description, it is, however, worth noting three particular features that

have been introduced to capture the specific situation of developing countries and that were found to be critical in determining the outcome of the different instruments of the stabilization policies. These are the influence of inflation on capital flight, the impact of inflation on investment, and the respective role of private and public investment in enhancing productivity growth.

a) Inflation and capital flight

Developing countries, and particularly Latin American countries, have suffered from extensive capital flight during the stabilization attempts of the 1980's. Capital flight is generally viewed as a consequence of the differential between low domestic interest rates (especially when domestic interests rates are controlled) and high foreign interest rates (especially before an expected devaluation). As Cuddington (1987) notes, however, interest rates' differential cannot explain entirely the observed pattern of capital flight. Other factors, including inflation, seem to influence capital flight. A possible explanation is that domestic and foreign currency are not perfectly substitutable because they have different risk components. With a floating exchange rate, the real exchange rate will stay fairly constant over time so that the rates of inflation and devaluation will be closely related. Consequently, the real value of foreign currency is stable, and foreign currency is a fairly safe investment. On the other hand, the real value of a domestic currency investment depends on the actual inflation rate. Consequently, if the inflation rate is volatile, domestic currency is relatively risky to hold. Risk averse agents will, therefore, hold less domestic financial assets and more foreign assets if they feel that the rate of inflation is unstable. Assuming that the level of inflation is a good indicator of the variance of inflation (i.e., if the coefficient of variation of inflation is stable), a higher level of inflation will induce a switch away from domestic assets toward foreign assets. This is modeled in equation (35) below.

b) Inflation and investment

An implication from the impact of inflation on capital flight is that inflation will have an indirect negative impact on investment because it reduces the domestic funds available for loans. There is also indication that inflation directly reduces the demand for investment. One explanation is that agents see inflation as a signal of economic problems and thus of low future growth. This reduces their expectation on return to investment, which depends on future demand for output.

c) Impact of private and public investment

The principal effect of capital accumulation from investment in a 5-year time period is not the mere increase in the stock of capital but in the technological changes and productivity gains imbedded in the renewal of capital. A growing literature emphasizes the importance of public investment for growth of productivity, especially in developing countries where the government has to provide so much of the basic infrastructure, electricity, and telecommunication. For instance, it is often argued that development of agriculture is very difficult without a basic system of roads necessary for the transportation of food to the cities.

This phenomena is modeled with distinct and complementary productivity effects of both private and public investment in sectoral production functions. It is worth noting that most existing applied general equilibrium models implicitly assume this complementarity. Indeed, most real-side models do not take into account the source (in terms of institution) of investment. All private and public investments are aggregated into one account and then allocated toward sectors with constant shares. Here, on the contrary, the demand for investment, as well as its financing, is explicitly modeled for each institution.

3.2. Real Side of the Model

The equations of the model and a list of the variables are reported in Table 3. The real side of the model follows the standard neoclassical specification of general equilibrium models (see Dervis, de Melo and Robinson (1982)). The specification of international trade allows for imperfect substitution between domestic goods and goods on the international market. Domestically produced goods X_i are allocated between exports E_i and goods sold on the domestic market D_i within a constant elasticity of transformation (CET) framework. Hence, the producer price PX_i is itself a CET function of the export price PE_i and of the price of goods sold on the domestic market PD_i (equation (4)). D_i then is combined with imports M_i within a constant elasticity of substitution (CES) aggregation function to make the total supply on the domestic market Q_i, whose price P_i is thus a CES function of PD_i and the import price PM_i (equation (2)). Import and export prices (equations (1) and (3)) are equal to the world price PW_i converted into domestic currency at the exchange rate ER and adjusted for import taxes tm_i, export taxes te_i, and indirect taxes td_i. A constant trade margin coefficient mg_i is also added to each transaction (hence, included in the price), and the corresponding services will be added (see below) to the demand for the trade sector. Equations (5) to (7) compute a set of prices also used in the model: PN_i is the net price (or value added price) received by the producer and is defined as the price of output from which the costs of intermediate inputs (a_{ji} is the input-output coefficient of input j in output i) and of working capital are subtracted. As we shall see, the demand for working capital is assumed to be proportional to the nominal value of production so that the cost of working capital per unit of output is proportional to the nominal interest rate rd. The price of one unit of capital good used for investment in sector i, PK_i, is the average price of its components weighted by g_{ji}, the share of good j in the capital good of sector i. $PINDEX$ is an aggregate price index.

Sectoral gross output X_i^s is a CES function of the given capital stock K_i and labor (equation (8)), while a Leontief technology is assumed for intermediate inputs and working capital. The demand for intermediate use of good j in the production of sector i, N_{ij}, is thus given by equation (9). Labor is divided in L imperfect substitute categories corresponding to different skills and aggregated in the production function with a Cobb Douglas (CD) function. Sectoral labor demand by category L_{li}^d is derived from profit maximization by the firms and depends on the net price of output and the vector of wages w (equation (10)). Labor supply by category L_l^s is assumed to be given in the current period (equation (11)). The labor market can be closed in two

Table 3 - Equations of the Financial CGE

Price System

(1) $PM_i = \overline{PW}_i \; ER \; (1 + tm_i + td_i + mg_i)$

(2) $P_i = \text{CES}\left(PD_i\,(1 + td_i + mg_i),\, PM_i\right)$

(3) $(PE_i(1 + te_i + td_i + mg_i) = \overline{PW}_i \; ER$

(4) $PX_i = \text{CET}\,(PD_i, PE_i)$

(5) $PN_i = PX_i - \sum_j a_{ji} P_j - k_i rd$

(6) $PK_i = \sum_j \gamma_{ji} P_j$

(7) $PINDEX = \sum_i \mu_i P_i$

Production

(8) $X_i^s = a_i \, CES\left(K_i, CD(L_{li}^d)\right)$

(9) $N_{ji} = a_{ji} X_i^s$

Labor Market

(10) $L_{li}^d = L_{li}(PN_i, w)$

(11) $L_l^s = \overline{L_l^s}$

(12) $L_l = \sum_i L_{li}^d$

Wage Determination

(13) $L_l = L_l^s$ full employment

(13') $w_l^t = \alpha \; w_l^{t-1} \left(\frac{PINDEX^t}{PINDEX^{t-1}}\right)^{\sigma_1} \left(\frac{PINDEX^{t-1}}{PINDEX^{t-2}}\right)^{1-\sigma_1} \left(\frac{U_l^{t-1}}{\overline{U_l}}\right)^{-\sigma_2}$

partially indexed wage

(14) $U_l = L_l^s - L_l$

Institutions Income

(15) $KINC_i = \left((1 - td_i)\, PX_i - \sum_j a_{ji} P_j\right) X_i^s - \sum_l w_l L_{li}^d$

(16) $Y_i = KINC_i - rd^{t-1} \, BD_i^{t-1} - ER \;\; rf^{t-1} \, BF_i^{t-1}$

(17) $Y_h = \sum_l \alpha_{hl} w_l L_l + \sum_i \alpha_{hi} dr_i Y_i + \alpha_{hb} dr_b Y_b + rd^{t-1} \, TD_h^{t-1}$

(18) $Y_g = \sum_i t_i Y_i + \sum_h t_h Y_h + \sum_i tm_i \; ER \; \overline{PW}_i M_i + \sum_i te_i \; ER \; PE_i \; E_i$
$-rd^{t-1} BD_g^{t-1} - ER \; rf^{t-1} \, BF_g^{t-1}$

(19) $Y_b = rd^{t-1}\left(\sum_i BD_i^{t-1} + BD_g^{t-1}\right) - rd^{t-1} \sum_h TD_h^{t-1}$

Product Demand

(20) $C_{hi} = \text{LES}\left((1 - t_h)\, Y_h - S_h, P\right)$
subject to the household budget constraint:

$S_h + \sum_i P_i \, C_{hi} \equiv Y_h$

(21) $C_{gi} = gcons_i \; \overline{GCONS}$

(22) $Z_i = \sum_j \gamma_{ij} \, I_j + ginv_i \; \overline{GINV}$

(23) $N_i = \sum_j N_{ij}$

(24) $HOUSH_i = \frac{HOUSH_{0i}}{\sum_j P_j \, HOUSH_{0j}} \sum_h hous_h \, S_h$

(25) $DST_i = \frac{DST_{0i}}{\sum_j P_j \, DST_{0j}} \left(\sum_j \overline{\Delta ST}_j + \overline{\Delta ST}_g\right)$

(26) $Q_i = \sum_h C_{hi} + C_{gi} + Z_i + N_i + DST_i + HOUSH_i$

(27) $Q_i = \text{CES}\left(D_i^d,\ M_i\right)$

(28) $\dfrac{M_i}{D_i^d} = \text{CES}^*\left(\dfrac{PM_i}{PD_i(1+td_i+mg_i)}\right)$

(29) $X_i^s = \text{CET}\left(D_i^s, E_i\right)$

(30) $\dfrac{E_i}{D_i^s} = \text{CET}^*\left(\dfrac{PE_i}{PD_i}\right)$

(31) $MG = \sum_i mg_i(PW_i\ ER\ M_i + PE_i\ E_i + PD_i\ D_i^d)$

$D_i^s = D_i^d \qquad i \neq \text{trade sector}$

(32) $D_i^s = D_i^d + \dfrac{MG}{P_i} \qquad i = \text{trade sector}$

Households' Capital Account

(33) $S_h = s_{0h}\left(\dfrac{jt_h}{1+\hat{\pi}}\right)^{\alpha_{4h}} Y_h$

(34) $\dfrac{g_{1h}}{1-g_{1h}} = \phi_{1h}\left(\dfrac{jp}{jb_h}\right)^{\varepsilon_{1h}} (1+\hat{\pi})^{-\varepsilon_{9h}}$

(35) $\dfrac{g_{2h}}{1-g_{2h}} = \phi_{2h}\left(\dfrac{1+rd}{(1+\overline{rf})(1+\hat{ER})}\right)^{\varepsilon_{2h}} (1+\hat{\pi})^{-\varepsilon_{10h}}$

(36) $jb_h = g_{2h}(1+rd) + (1-g_{2h})(1+\overline{rf})(1+\hat{ER})$

(37) $jp = \left(1 + \dfrac{\sum_i KINC_i}{\sum_i PK_i\ K_i}\right)(1+\hat{\pi})$

(38) $jt_h = g_{1h}\ jp + (1-g_{1h})\ jb_h$

(39) $\log(H_h) = \alpha_{1h} + \alpha_{2h}\ \log(Y_h) + (1-\alpha_{2h})\log(PINDEX) - \alpha_{3h}\log(jt_h)$

(40) $SK_h = (1-hous_h)\ S_h - \Delta H_h$

(41) $DEP_h = g_{1h} SK_h$

(42) $\Delta TD_h = g_{2h}(1-g_{1h})\ SK_h$

(43) $ER\Delta F_h = (1-g_{2h})(1-g_{1h})\ SK_h$

Firms' Capital Account

(44) $\dfrac{I_i}{K_i} = a_0\left(\dfrac{KINC_i(1+\hat{\pi})}{PK_i\ K_i(1+rd)}\right)^{\varepsilon_{5i}} (1+\hat{\pi})^{-\varepsilon_{6i}}$

(45) $H_i = k_i\ PD_i\ X_i^s$

(46) $S_i = (1-t_i-dr_i)\ Y_i$

(47) $BREQ_i = PK_i I_i - S_i - \sum_h \beta_{ih}\ DEP_h - \beta_{ig}\ DEP_g + \Delta H_i + \overline{\Delta ST}_i$

(48) $\dfrac{g_{4i}}{1-g_{4i}} = \phi_{4i}\left(\dfrac{1+rd}{(1+\overline{rf})(1+\hat{ER})}\right)^{-\varepsilon_{4i}}$

(49) $\Delta BD_i = g_{4i}\ BREQ_i$

(50) $ER\ \Delta BF_i = (1-g_{4i})\ BREQ_i$

Government Capital Account

(51) $S_g = Y_g - \sum_i P_i\ C_{gi} - rd^{t-1}\ BD_g^{t-1} - ER\ \overline{rf}^{t-1}\ BF_g^{t-1}$

(52) $BREQ_g = \sum_i PK_i\ ginv_i\ \overline{GINV} + \overline{\Delta ST}_g + \overline{DEP}_g - S_g$

(53) $\Delta DC_g = \omega_1\ BREQ_g$

(54) $\Delta BD_g = \omega_2\ BREQ_g$

(55) $ER\ \Delta BF_g = (1-\omega_1-\omega_2)\ BREQ_g$

Central Bank

(56) $MB = DC_g + ER\ FF + DC_p - AS_{cb}$

(57) $AS_{cb} = AS_{cb}^{t-1} + FF^{t-1}\,\Delta ER$

(58) $MB = CU + RR$

(59) $RR = re\ DD$

Commercial Banks

(60) $S_b = (1 - t_b - dr_b)\,Y_b$

(61) $BD = \sum_h TD_h + DD - RR + AS_b$

(62) $AS_b = AS_b^{t-1} + S_b$

Asset Markets Equilibria

(63) $CU = cu\left(\sum_h H_h + \sum_i H_i\right)$

(64) $DD = (1 - cu)\left(\sum_h H_h + \sum_i H_i\right)$

(65) $\sum_i PE_i E_i - \sum_i \overline{PW_i} M_i - \sum_h \Delta F_h + \Delta BF_g + \sum_i \Delta BF_i = \Delta FF$

(66) $ER = \overline{ER}$ or $FF = \overline{FF}$

(67) $BD + DC_p = BD_g + \sum_i BD_i$

(68) $BF_r = BF_g + \sum_i BF_i$

(69) $\hat{\pi} = \sigma_3\left(\frac{PINDEX^t}{PINDEX^{t-1}} - 1\right) + (1 - \sigma_3)\left(\frac{PINDEX^{t-1}}{PINDEX^{t-2}} - 1\right)$

(70) $\hat{ER} = \hat{\pi}$

Dynamic

(71) $a_i^t = a_i^{t-1}\ \ \alpha_i\left(\frac{GINV^{t-1}}{K_i^{t-1}}\right)^{\varepsilon 7}\left(\frac{I_i^{t-1}}{K_i^{t-1}}\right)^{\varepsilon 8}$

(72) $K_i^t = K_i^{t-1}(1 - dk_i) + I_i$

Endogenous Variables

PM_i Import price in domestic currency
P_i Price of composite good
PD_i Price of domestically produced good for domestic market
PE_i Export price in domestic currency
PX_i Average producer price
PN_i Net producer price
PK_i Price of capital good for investment in sector i
$PINDEX$ Price index
a_i Total factor productivity
K_i Capital stock in sector i
X_i^s Domestic production
N_{ji} Use of input j in sector i
II_i Working capital use in sector i
L_{li}^d Demand of labor of category l in sector i
L_l^s Supply of labor of category l
w_l Wage of labor of category l
L_l Employment of labor category l
U_l Unemployment of labor category l
$KINC_i$ Capital income of firm i
Y_i Income of firm i
Y_h Income of household h
Y_g Government revenues
Y_b Banks' income
C_{hi} Private consumption
C_{gi} Government consumption
Z_i Demand for good i for investment
N_i Demand for intermediate input
$IIOUSH_i$ Product demand for housing investment
DST_i Change in stocks
Q_i Domestic demand for composite good
M_i Import
D_i^d Domestic demand for domestically produced good
D_i^s Supply of domestically produced good
E_i Export
S_h Savings of household h
MG Trade margin revenues
rd Nominal interest rate on time deposits and domestic loans
jb_h Average yield on bonds for household h
jp Yield on capital asset
jt_h Average yield on all assets for household h

H_h	Demand for money from household h
SK_h	Flow of savings allocated to investment assets (all assets except money)
$g1h$	Share (in flows) of investment assets allocated to capital
$g2h$	Share (in flows) of bonds allocated to domestic bonds (time deposits)
DEP_h	Household capital investment
TD_h	Time deposit of household h
F_h	Foreign bonds of household h
I_i	Investment of firm i
S_i	Retained earnings of firm i
$BREQ_i$	Borrowing requirement of firm i
$g4i$	Share (in flows) of borrowing requirement financed by domestic borrowing
BD_i	Domestic borrowing from firm i
BF_i	Foreign borrowing from firm i
S_g	Government savings (- = deficit)
$BREQ_g$	Government borrowing requirement
DC_g	Domestic credit to government (from central bank)
BD_g	Government domestic borrowing
BF_g	Government foreign borrowing
MB	Monetary base
FF	Foreign currency reserve in central bank
AS_{cb}	Central bank net wealth (sum of capital gains on foreign reserves)
CU	Currency in circulation
RR	Required reserves
DD	Demand deposits in commercial banks
S_b	Retained earnings of commercial banks
BD	Total loan from commercial banks
AS_b	Commercial banks' net wealth (accumulated savings)
ER	Exchange rate
BF_r	Total foreign loans
$\hat{\pi}$	Expected inflation
$E\hat{R}$	Expected currency depreciation

Exogenous Variables and Coefficients

$\overline{PW_i}$	World price of good i
te_i, tm_i	Export and import taxes on good i
mg_i	Trade margin on good i
td_i	Indirect tax rate on good i
a_{ij}	Input-output coefficient
k_i	Working capital coefficient
γ_{ij}	Capital composition coefficient
μ_i	Weights in price index
t_i	Tax rate on profits in sector i
t_h	Tax rate on income of household h
dr_i, dr_b	Distributed profits for firm i and commercial banks
α_{hl}	Ownership share of household h in labor l
α_{hb}	Ownership share of household h in commercial banks
α_{hi}	Ownership share of household h in capital of sector i
$gcons_i$	Share of good i in government consumption
$ginv_i$	Share (inflow) of good i in government investment
$hous_h$	Flow of household savings allocated to housing
$HOUSH_{0i}$	Share of good i in housing demand
DST_{0i}	Share of good i in change in stock
$\overline{\Delta ST}_j$, $\overline{\Delta ST}_g$	Change in stocks from firms and government
$\overline{rf}$	Foreign interest rate
β_{ih}	Sectoral share of household investment
DC_p	Direct credit from central bank to private sector
re	Reserve requirement ratio
cu	Currency/money ratio (same for households and firms)

Policy Variables

$\overline{ER}$ or $\overline{FF}$	Exchange rate
$\overline{GCONS}$, $\overline{GINV}$	Government consumption and investment
$t's$	Taxes and tariff rates
ω_1, ω_2	Financing of deficit by central bank credit, domestic borrowing, or foreign borrowing
re	Reserve requirement

Functions

CES	Constant elasticity of substitution function
CET	Constant elasticity of transformation function
CES*	Derived relation from cost minimization in a CES
CET*	Derived relation from revenue maximization in a CET
CD	Cobb-Douglas function

alternative ways: In the neoclassical closure (equation (13)), the wage rate is perfectly flexible and adjusts to clear the labor market. In the Keynesian closure (equation (13')), the wage rate is given by an independent relation and unemployment appears. In both cases, realized employment in category l, L_l, is equal to the demand for labor (equation (12)), and unemployment is defined by equation (14). In most simulations, the closure with partially adjusting wages will be used (see below under "dynamics" for a discussion of the chosen specific wage adjustment mechanism).

Capital income by sector is given in equation (15) as sales revenues net of taxes, intermediate costs, and labor payments. A firm's net income Y_i (there is one firm by sector) is equal to its capital income from which interest on previous borrowing is deducted. The households derive their income from payments to labor services and other transfers. The households are divided into socioeconomic groups depending on their skill level, education, and geographical location. Household h receives income (equation (17)) from labor of each category l (in proportion α_{hl} to its ownership share in labor category l), distributed profit from each firm i and banks (in proportion α_{hi} and α_{hb} to its ownership share in firm i and banks), and interest payments from its time deposit account. The government (equation (18)) receives direct taxes on a firm's profits and household income, import duties and export taxes, and pays interest on its borrowing from the previous year. Banks (equation (19)) receive income from interest payments on government and firms' borrowing and pay interest on time deposits to households.

The demand for goods by households is given in equation (20). Households' consumption functions depend on their income, savings, and the vector of prices. Saving behavior is described below in the capital account. The demand functions satisfy the household's budget constraint, which states that its income must equal the sum of its savings, tax payments, and consumption expenditures. A linear expenditure system (LES) is chosen as the functional form for the household consumption function.

Government total demand for consumption (*GCONS*) and investment (*GINV*) are policy variables, but their sectoral allocation is given by fixed coefficients (in equations (21) and (22)). Demand for goods for investment purposes also come from the private sector. It is derived from sectoral investment demands through the matrix of coefficients γ_{ij} that gives the composition of investment goods in each sector. Total demand for investment is Z_i.(equation (22)). Demand of good i for intermediate use in equation (23) is the sum of the demands N_{ij} (from equation (9)) from each sector j.

Equations (24) and (25) give the demand of goods for housing and change in stocks. To simplify the model, it is assumed that nominal expenditures on these items (determined in the model's capital account) are allocated across goods with constant proportionality coefficients.

Total demand for goods Q_i (equation (26)) is the sum of all demands described above. It is shared between imports and domestically produced goods according to a ratio that depends on their respective prices (equations (27) and (28)), which determines the demand for domestically produced goods D_i^d. The supply of goods X_i^s

also is allocated between goods sold for exports and goods sold domestically with a ratio depending on their respective prices (equations (29) and (30)). Equation (31) defines the revenues from the trade margin, which is considered a demand for the trade sector output. The goods market is completed by equation (32) which imposes equilibrium between demand for and supply of domestic goods.

3.3. Financial Side of the Model

Although the balance sheets described above show the stocks of assets and liabilities, most behavioral equations are stated in flows rather than stocks in the formulation of the model. The only exceptions are the demand for money by households and firms. This formulation implies that previous period stocks of assets other than money are not renegotiated in the current period, the decision of allocation between assets corresponding only to the new savings of the period. The description of the model in Table 4, therefore, does not include the computation of the stock and value of the various "accumulated savings" mentioned in Table 3, although this computation is done in the computer model for the updating of assets for the following period.

Total households' savings (equation (33)) respond with an elasticity α_{4h} to the average interest rate $jt/(1 + \hat{\pi})$ on all the assets they hold, with this interest rate being itself an outcome of the allocation decisions described below (equation (38)). These savings are allocated between the different assets with a branching decision structure as follows: Money demand is given (equation (39)) by a traditional money demand function, depending on real income (elasticity α_{2h}), the price level (elasticity 1), and the interest rate on all assets (elasticity α_{3h}). The residual from savings SK_h (from which a constant share $hous_h$ is spent on housing investment; equation (40)) is allocated to productive investment DEP_h in proportion g_{1h} (equations (34) and (41)). To limit the number of assets, DEP_h includes both equity participation in incorporated firms and direct investment from households in their own productive unit. The share g_1 depends on the return on capital $jp/(1 + \hat{\pi})$ and the average interest rate on financial assets $jb/(1 + \hat{\pi})$ (computed in equation (36)). The return on capital (equation (37)) is computed as the current period capital income divided by the value of productive capital stock. The remainder of a household's savings then is allocated between domestic assets (time deposits TD_h) and foreign assets F_h, with a share depending on their respective interest rates (equations (35), (42) and (43)). The return on foreign assets takes into account expected devaluation.

As explained above, households are also influenced by the expected level of inflation rate for their portfolio decisions. Because of liquidity and risk concerns, higher inflation will make them shift out of capital and domestic financial assets toward foreign assets. This effect is included in the model with the elasticity coefficients α_{9h} and α_{10h} in the share equations (34) and (35).

Firms' investment and financing decisions are summarized in equations (44) to (50). From their income given in equation (16), firms pay profit taxes with a rate t_i fixed by the government, distribute a fraction dr_i of their surplus (it is assumed that this fraction is exogenous, estimated from previous years), and keep S_i of savings (or

Table 4 - Structural Characteristics of the Ecuadorian Economy, 1980

I. Macroeconomic characteristics

GDP per capita (US$)	1406 US$	Balance of trade deficit / exports value	1.0 %
Population	7.65 millions	Balance of payments deficit / exports valu	19.5 %
Imports/Domestic Demand	15.6 %	Balance of payments deficit / GDP	5.4 %
Exports/ GDP	27.4 %		

II. Sectoral characteristics

	Agriculture	Oil	Industry	Util. Constr. Services	Administr.
Share in Value-Added	13	11.5	17.5	48.1	9.9
Share in Exports	9.5	54.7	23.0	12.7	0.0
Share in Imports	3.3	7.8	74.1	14.8	3.3

III. Government Budget

	Share in Revenues		Share in Expenditures
Income taxes and transfers	28.2	Current expenditures	52.4
Indirect taxes and Import tariff	34.8	Transfer to Rest of World (inc. debt service	9.9
Oil revenues	37.0	Miscellaneous current account	9.9
Deficit	17.6	Investment	22.9
		Miscellaneous capital account	4.8

Financing of the deficit (percent)

Foreign borrowing	143
Domestic borrowing	-32
Credit from Central Bank	-11

IV. Households Income

	Class Income	Sources of Income (percent)								Benefits from Governt Curr. Exp. (% of inc.)
		Labor Income			Unincorporate Capital Income				Transfers from Govt	
	(Sucres)	Agric.	Unskilled Non Agric.	Skilled Non Agric.	Agric.	Ind.	Other Non Agr.	Other		
Small Farms	33966	23	39.8	3.8	9.3	7.1	11.8	4.3	1.3	4.5
Medium Farms	11326	30	16.3	2.6	34.0	3.8	10.5	2.4	0.2	3.0
Large Farms	13093	23	9.0	4.0	46.2	2.3	13.5	2.1	0.4	3.0
Rural NonAg.	19253	3	39.7	9.7	9.1	8.7	24.8	4.1	0.6	10.6
Urb. Low Educ.	70911	1	44.5	8.8	2.7	11.7	19.8	7.3	3.8	9.6
Urb. Med. Educ.	55499	1	32.8	29.8	0.7	6.4	14.9	9.6	5.3	9.1
Urb. High Educ.	37893	0	4.8	64.7	0.8	0.8	11.3	12.3	4.9	2.3
Rural	77638	19	31.2	5.1	19.1	6.2	15.1	3.6	0.8	5.5
Urban	164303	0.845286	31.4	28.8	1.6	7.4	16.2	9.2	4.5	7.7
Total	241941	7	31.3	21.2	7.2	7.0	15.9	7.4	3.3	7.0

V. Income per Capita

	Population Share	*Income per Capita* (US$)	Relative to average	*Utility per Capita* (US$)	Relative to average
Small Farms	30.3	586	0.5	612.5	0.5
Medium Farms	8.1	731	0.6	753.1	0.6
Large Farms	5.0	1369	1.1	1410.3	1.0
Rural NonAg.	7.4	1360	1.1	1504.6	1.1
Urb. Low Educ.	32.5	1141	0.9	1250.4	0.9
Urb. Med. Educ.	12.5	2322	1.8	2532.8	1.9
Urb. High Educ.	4.2	4718	3.7	4826.0	3.6
Rural	50.8	799	0.6	843	0.6
Urban	49.2	1746	1.4	1881	1.4
Total	7.65	1265	1.0	1354	1.0

retained earnings; equation (46)). Firms require financing (equation (47)) to cover their investment, change in working capital, and change in stocks. Changes in stocks are considered exogenous in the model and equal in real terms to their base year values. Working capital stock is assumed to be proportional to the nominal value of the firm's production (equation (45)). Investment demand by sector depends on the rate of return to capital available in that sector relative to the cost of domestic borrowing *rd*, with an elasticity ε_{5i} (equation (44)). As before, the return to capital is measured by the current period capital income (here in that sector) divided by the value of the sectoral stock of capital. As discussed above, investment demand also responds negatively to inflation with an elasticity ε_{6i}. Firms finance their holding of assets with their retained earnings, equity, and borrowing. Borrowing is divided between domestic and foreign borrowing with the share depending on their respective real costs (equation (48)).

The government's capital expenditures consist of investment, change in stocks, and direct equity participation DEP_g (mostly transfers to public firms). From these three variables, only investment is considered a policy variable. Equity participation is essentially financing of public firms and is taken as constant. Changes in stocks are also considered as exogenous. Given the government savings (equation (51)) and capital expenditures, equation (52) determines the government's borrowing requirement $BREQ_g$ which is met from three sources: direct credit from the Central Bank DC_g, borrowing on the domestic loan market BD_g, and foreign borrowing BF_g. The respective shares of borrowing met by these sources (ω_1, ω_2, and 1 - ω_1 - ω_2) are instruments for the monetary policy of the government (equations (53) to (55)).

The equations for the Central Bank and the commercial banks essentially restate the equality of their assets and liabilities from their balance sheets. Equation (57) gives the central bank's accumulated savings in terms of previous period value and current period capital gains on foreign assets. Equations (56) and (58) define the monetary base in its asset and liabilities forms. In equation (56), direct credit to the private sector DC_p is taken as exogenous. Given the direct credit to the government required by the government deficit financing policy and the foreign exchange reserve derived from the balance of payment equations, the only policy variable left to the Central Bank is the composition of the monetary base in terms of currency and demand deposits. By setting the reserve requirement *re*, the Central Bank can implicitly control that composition (equation (59)) and, therefore, the supply of money, as previously indicated. In the simulations, the money supply often will be used as the policy variable, implying that the Central Bank sets the reserve requirement necessary to reach the desired level of money supply.

Commercial banks' savings (equation (60)) are defined in the same way as savings of the firms and are added to the previous period's accumulated savings to give the new stocks of savings (equation (62)). Equation (61), which determines the availability of loans on the domestic market, is derived from the equality of assets and liabilities. The only assumed behavior for the commercial banks is to set the interest rate on loans and deposits such that there is equilibrium on the loan market. For simplicity, it is assumed that the commercial banks set the same interest rate on time deposits and domestic loans.

The remaining equations close the model by imposing equilibrium on all asset markets. Equilibrium on the money market is defined both in terms of currency and demand deposits. Households and firms are assumed to hold money allocated with constant proportion between currency (share *cu*) and demand deposit (share (1 - *cu*)); hence, the equilibrium conditions of equations (63) and (64). Equation (65) states that the excess supply of foreign exchange resulting from current and capital account foreign exchange transaction results in an equivalent increase in Central Bank reserves. With a fixed exchange rate, a change in reserves accommodates any excess supply or demand of foreign exchange. With a floating exchange rate, the Central Bank sets a given change in reserve (generally zero) and the exchange rate adjusts until excess supply or demand disappears (equation (66)). Equations (67) and (68) show the equilibria on the domestic and foreign bond markets. In equation (68), BF_r is assumed to adjust to match the demand for foreign borrowing (infinitely elastic supply).

3.4. Expectations and Dynamics

As indicated in section 1, the formation of expectations is assumed to follow an adaptative framework. Equation (69) describes the specific equation for inflationary expectations. The expected next year's inflation $\hat{\pi}$ is a weighted average of this year's inflation and last year's inflation, with a weight σ_3 on the current year and (1 - σ_3) on the previous year. As for expectations of devaluation, it is assumed that agents do not expect any real devaluation or revaluation so that expected devaluation is equal to expected inflation (equation (70)).

The dynamic part of the model essentially consists of updating exogenous variables (such as population growth, productivity gains, and international prices) and stocks of assets. Stocks of financial assets are computed, with beginning of period financial assets stocks equal to the stocks at the end of the previous period. Stocks of commodities in the firms are similarly updated. These are not reported in the table of equations, as they do not affect the rest of the model. For capital stocks, the new period's capital stock is the sum of last period's capital stock (net of depreciation) augmented by last period's investment (equation (72)). The depreciation rate is constant over time but varies across sectors. Equation (71) relates total factor productivity growth in each sector i to the sectoral private investment in the sector and to public investment, both of them normalized by the sectoral capital stock. This expression supports both the differential role and the complementarity of public and private investment discussed above.

One important exception to this simple updating mechanism is in the wage adjustment mechanism. The adjustment equation (13) combines the Phillips curve type adjustment described above, with the change in wage negatively correlated with the rate of unemployment, and a partial adjustment mechanism. Rewriting equation (13) as follows:

$$w_i^t = \alpha\, w_i^{t-1}\, \frac{PINDEX^{t-1}}{PINDEX^{t-2}} \left(\frac{PINDEX^t / PINDEX^{t-1}}{PINDEX^{t-1} / PINDEX^{t-2}} \right)^{\sigma_1} \left(\frac{U_i^{t-1}}{\bar{U}_i} \right)^{-\sigma_2},$$

elucidates an underlying process of wage formation. Nominal wages are renegotiated at the beginning of each period with a "normal" increase (α) and full adjustment for last year's inflation (third term in the equation). Then, when actual inflation materializes during the period, only partial readjustment of the negotiated base is done to take into account the change in inflation rate from last year. This leads to a loss in real wage in periods of increasing inflation but an increase in real wage in the first period of lower inflation. We will see that this lag in the wage adjustment process and related cost of labor will have important consequences on the path of adjustment of the economy to external shocks that spur inflation and symmetrically on the effects of policies designed to control inflation. In the long run, when inflation is stabilized, the rate of unemployment comes back to its natural rate $\overline{U}_t$.

This completes the formal specification of the model. However, its behavior in response to an external shock, or to changes in policy, depends critically on the structural characteristics of the economy. This is imbedded both in the original distributional characteristics between sectors, between factors of production, and between households and in the many parameter values used in the functional forms. The complete database is described in the following paragraph.

IV. Database and Model Calibration

The database for the model simulation consists of a complete set of values for the variables in the base year and of elasticity parameters.

4.1. The 1980 Social Accounting Matrix

The base year values are reported in the Social Accounting Matrix (SAM) for Ecuador in 1980 in Table 4bis (in appendix). The construction of this SAM is described in Fargeix's Ph.D. dissertation (forthcoming). It is based on the updating of the 1975 SAM constructed by Kouwenaar for the real accounts and on original data collection done by the author for the capital accounts. A few key structural characteristics extracted from the SAM's flow accounts are given in Table 4. Ecuador's economic structure is typical of a small, middle income oil exporting country. Its GNP per capita places this country at the upper bound of the middle income countries of the World Development Report classification. Its economy is fairly open to international trade, with imports representing 15.6 percent of domestic consumption and exports 27.4 percent of GDP. Exports are dominated by oil, while most of the imports are industrial goods. Benefiting from high oil prices in 1980, the balance of trade was almost in equilibrium. The balance of payments, however, was not, and its deficit amounted to 19.5 percent of exports revenues, or 5.4 percent of GDP. Half of these foreign transfers were debt service payments.

Foreign borrowing in 1980 was, however, greater than this deficit by 60 percent. This covered households' foreign assets' accumulation and allowed for an increase in the foreign reserves of the Central Bank. The government accounted for

74 percent of foreign borrowing and private firms for the remaining 26 percent. It is this public foreign borrowing that will be cut by 75 percent in the simulations of the debt crisis that follows.

The government occupies a large part in the economy. Its budget amounts to 30 percent of GDP. A particularity of Ecuador, and of many mineral exporters in general, is the importance of the revenues from these mineral exports in the government's budget. In Ecuador in 1980, 37 percent of the government's revenues came from oil revenues. The rest came from income taxes and miscellaneous transfers (28 percent) and from commodity taxes (35 percent) in equal shares between taxation of domestic products and import tariffs. There were no export taxes. This direct link between oil exports and government revenues creates a particular problem in that a drop in the world price affects government resources dramatically, before any recession of the economy further decreases the other sources of revenues. But it also means that a devaluation, which revalorizes exports revenues in domestic currency, will alleviate the government's budget deficit. Current expenditures on public services and public investment represent, respectively, 52 percent and 23 percent of the government's budget, the rest being transfers to the rest of the world (10 percent), for debt service in particular, and miscellaneous other transfers. Revenues cover only 85 percent of the expenditures. Foreign borrowing was, however, sufficiently large in this year so that the government could actually put some money in the domestic credit market rather than borrow from it and reimburse Central Bank's credit rather than have to turn to this institution for money creation.

The level of disaggregation considered in the model includes nine sectors: two agricultural sectors (export agriculture and other agriculture), the oil sector, two industrial sectors (consumer goods, which include food processing, textiles, and leather; and producer and capital goods), and four mostly nontradables sectors (utilities, construction and transportation; trade; services; and the public sector). The relative importance of these sectors is close to the average values for the middle income oil exporter countries, with 13 percent for agriculture, 17.5 percent for manufacturing, and 58 percent for the nontradables activities. Exports revenues are dominated by oil exports (54.7 percent) followed by manufacturing (23 percent). These include processed agricultural products as well as the emerging shrimp exports, leaving a low share to raw agricultural exports.

For the social disaggregation, we consider three labor categories (unskilled, skilled, and agricultural labor), and seven household classes (small farmers, medium farmers, large farmers, and nonagricultural households for the rural households; and three urban households by level of education). The total income of each class and its decomposition by source is reported in Table 4. The poor have strikingly diversified sources of income. Small farmers earn 66 percent of their income from labor services (including labor on their own farm), with two-thirds originating in nonagricultural activities. All farm sizes obtain about 15 percent of their income from profits from nonagricultural activities. The urban poor also have diversified sources of income, with 43 percent of their income from profits in informal sector activities. This is an important feature since it implies that the urban group will be fairly well protected against wage repression policies. By contrast, the urban medium and rich households have high shares of their incomes coming from wages on the market for skilled

nonagricultural labor. Profits earned by unincorporated capital and distributed profits from firms account for less than 20 percent of the upper class income. The benefits from government social programs (health and education) are evaluated at their cost and attributed to each class in proportion to their participation rates. These numbers show the strong urban bias of social programs and the regressivity of their distribution in absolute per capita values.

The last section of Table 4 characterizes the distribution of income per capita. Based on the distribution of population per class, income and utility per capita (with utility defined as income plus the cost of imputed benefits from government social programs) are computed. They show a moderate income inequality in rural areas with income and utility ratios of 1 to 2.5 and a higher urban inequality with ratios of 1 to 4. These measures of inequality across groups clearly depend on the level of aggregation considered, but the relatively low initial levels of inequality also reflect the fact that the oil and debt boom of the 1970's had benefited the rural and urban poor through extensive employment opportunities in construction and services and rising real wages. The ratio of 2.2 between average rural and urban incomes justifies the need to separate these two groups when looking at poverty issues.

4.2. Elasticities

Elasticity parameters used in the simulation are reported in Table 5. Parameters for the real side of the model are taken from Kouwenaar, with some necessary adjustment to accommodate for the more aggregated scheme of our model. The higher level of aggregation implies, in particular, less dispersion in parameters. Parameters for the financial side of the model have not been estimated due to the lack of data. In particular, there is no time series available on household holdings of financial assets disaggregated by household groups. To limit the number of arbitrary parameter choices, all elasticity parameters were taken as constant across household and across firms. Econometric estimations were done at the aggregate level and compared with estimates found in the literature. The final choices reflect both econometric work and information from the other sources.

4.3. Base Run and Model Calibration

The period 1980-1987 was a very hectic period in Ecuador, with continual changes in policy, extensive use of all sorts of quantity rationing schemes and reforms, and with almost every year some serious external shock on the petroleum sector (huge variation in prices and interruption of production after the breaking of the pipeline in 1987) and in agriculture (devastating flood in the winter of 1982-83). The validation of the model by its ability to reproduce the historical path followed by the economy was, therefore, not considered a feasible alternative. We chose to calibrate the model in a more theoretical way, relying in particular on the generation of a steady-state economy when no foreign sector shocks occur, with trends as close as possible to those observed in the pre-crisis period in Ecuador, i.e., where the annual growth rate was 3.4 percent in GDP, 1.5 percent in government expenditures, and

TABLE 5 - Elasticities and parameters used in the model

I Household consumption parameters

	Urban Households			Rural Households			
	Low educ	Med. educ	High educ.	Non agric	Small farm	Med. farm	Large farm
Ag exports	0.88	0.83	0.81	0.84	0.88	0.87	0.85
Other ag	0.77	0.73	0.71	0.84	0.88	0.87	0.85
Oil	0.78	0.74	0.72	0.98	1.03	1.02	1.00
Ind. consumer goods	0.71	0.67	0.66	0.81	0.85	0.85	0.83
Ind. producer goods	1.22	1.16	1.12	1.22	1.29	1.27	1.25
Util. Constr. Transp.	0.78	0.74	0.72	0.98	1.03	1.02	1.00
Trade	0.78	0.74	0.72	0.98	1.03	1.02	1.00
Services	1.23	1.17	1.13	1.07	1.13	1.11	1.10
Govt. services	0.99	1.00	1.01	1.01	0.99	1.01	1.03
Frish parameter	-4.00	-3.00	-2.00	-4.00	-4.00	-3.00	-2.00

II Sectoral parameters

	Ag exports	Other ag	Oil	Ind. cons.	Ind. prod.	Util. Constr. Transp.	Trade	Services	Govt. serv.
Capital-output ratio (initial)	0.94	1.77	0.53	0.32	0.50	0.94	0.60	1.50	0.00
Depreciation rate	0.02	0.06	0.01	0.09	0.17	0.09	0.14	0.05	0.08
Elasticity in import CES	0.60	0.80	0.80	0.90	0.80	0.50	0.80	0.60	0.90
Elasticity in export CET	0.80	0.60	0.90	0.90	0.60	0.80	0.95	0.95	0.95
Capital-labor in production	0.80	0.80	0.70	0.90	0.90	0.80	0.90	0.95	0.90

III Household financial parameters
(identical for all households)

Savings elasticity	a4	2.00
Money demand function		
Income elasticity	a2	0.70
Interest elasticity	a3	0.70
Physical vs financial share allocation		
Interest rate elasticity	e1	4.00
Inflation elasticity	e9	4.00
Domestic vs foreign bonds allocation		
Interest rate elasticity	e2	6.00
Inflation elasticity	e10	3.00

IV Sectoral financial parameters
(identical for all sectors)

Borrowing decision		
Dom vs. foreign borrowing	e4	2.00
Investment decision		
Interest rate elasticity	e5	1.00
Inflation elasticity	e6	1.50
Productivity of investment elasticities		
Public	e7	0.10
Private	e8	0.20

28 percent in money supply. These rates imply a rate of inflation of 25 percent. This is what is related as the base run in Table 6.

The estimation of the migration rate to urban areas is based on census statistics which show an annual growth rate of population in the urban sector equal to 1.3 percent above that in the rural sector.

V. Simulations

5.1. The Policy Experiments

The foreign sector shock simulated here originates in a 40 percent reduction in the government's foreign borrowing and a 30 percent fall in the price of primary exports, oil in this case. In the model, variables are at their pre-shock levels in year 1 and the shock occurs in year 2. In Table 6, we report the pre-shock values in year 1, the effects of the shock in years 2 and 3, and the values reached in the last year simulated, year 7. Since the growth rates in GDP and in per capita incomes or utilities in that last year are important in assessing future growth, they are also reported. The three responses which were available to the government in year 2 were the following:

i. No adjustment

In this case, government's current expenditures and public investment continue to grow, as in the base run without shock, at an annual rate of 1.5 percent. Since the exchange rate is flexible, devaluation occurs to save the necessary foreign exchange required by the foreign sector shock. Devaluation implies imported inflation, and the money supply is allowed, consequently, to increase by an exogenous 40 percent annually, compared to 27 percent in the pre-shock base run, in order to accommodate the rising demand for money.

ii. Fiscal adjustment

Public expenditures are reduced, in the shock year, in order to maintain the government deficit at the same level as before the shock. When the cut affects current expenditures and public investment, both are reduced by 18 percent relative to the level that they would have had without adjustment in year 2. Alternatively, the cut in government expenditures can be directed at current expenditures in order to preserve public investment. Afterward, government expenditures are allowed to grow at the annual rate of 1.5 percent as in the base run. Money supply continues to grow by 40 percent annually.

iii. Monetary adjustment

To fight inflation that is fueled by devaluation and government domestic borrowing, the annual growth in money supply is set at 25 percent in all periods. Government expenditures continue to grow at 1.5 percent per year as in the case of no-adjustment.

Table 6 - Fiscal and Monetary Policies in Response to a Terms of Trade and Debt Crisis

	BASE Values	Base Run: No Shock				Terms of Trade and Debt Crisis: No Adjustment				Terms of Trade and Debt Crisis: Fiscal Adjustment				Terms of Trade and Debt Crisis: Monetary Adjustment			
	Year 1	Year 2	Year 3	Year 7	Last year growth	Year 2	Year 3	Year 7	Last year growth	Year 2	Year 3	Year 7	Last year growth	Year 2	Year 3	Year 7	Last year growth
GDP																	
Real GDP growth *	3.4	3.4	3.1	2.6		-0.1	-1.9	1.0		-3.0	-0.5	1.5		-2.3	-0.2	1.3	
Real GDP	293341	3.4	6.6	18.8	2.6	-0.1	-1.9	0.5	1.0	-3.0	-3.5	3.4	1.5	-2.3	-2.5	3.5	1.3
Government deficit / GDP	4.0%	-3.5	-5.3	-1.1	2.4	76.6	111.1	144.2	1.7	-16.9	-0.4	-8.7	1.8	107.6	128.6	127.4	1.2
MONEY																	
Monetary base *	20.1	21.5	23.9	36.8		111.9	94.7	51.5		35.4	51.5	42.9		121.5	78.1	35.7	
Money supply *	28.0	30.0	30.0	30.0		40.0	40.0	40.0		40.0	40.0	40.0		25.0	25.0	25.0	
Inflation *	25.0	26.2	26.5	27.2		46.7	45.6	39.5		48.3	41.7	38.6		32.4	25.9	24.0	
Interest rate	25.0	1.8	5.8	28.4		186.9	256.0	281.0		64.5	95.3	92.0		199.9	216.9	212.6	
Private investment	41949	2.8	5.2	13.1		-39.9	-46.8	-45.7		-28.7	-33.0	-26.0		-39.2	-40.1	-34.8	
BALANCE OF PAYMENTS																	
Exchange rate *	25.0	25.0	25.1	25.3		75.3	41.9	39.0		81.1	38.5	37.8		54.3	23.5	23.5	
Exports ($)	73797	4.2	8.4	24.1		10.8	10.5	15.6		12.0	12.7	22.7		8.4	9.2	18.2	
Imports ($)	74526	3.6	7.0	20.9		-14.8	-16.6	-13.7		-16.2	-16.5	-9.6		-15.8	-15.6	-9.9	
Current account deficit / G	4.9%	-6.4	-12.3	-28.7		-33.6	-39.1	-40.6		-48.1	-49.3	-53.9		-25.6	-25.6	-33.9	
Capital flight	4900	8.9	16.0	34.8		-27.5	-27.2	-42.9		5.2	0.3	-6.6		-50.5	-57.6	-61.5	
EMPLOYMENT																	
Employment	1593	0.3	0.4	0.7		2.5	-4.6	-3.7		0.0	-5.5	-1.4		-4.0	-6.9	-2.1	
Average real wage	90	4.4	8.9	26.7		-6.7	1.1	2.2		-8.9	-3.3	-1.1		0.0	4.4	4.4	
WELFARE																	
Income																	
Rural small farmers	33968	3.8	7.4	20.8	2.7	0.2	-1.3	-0.2	0.6	-1.9	-2.0	4.4	1.3	-1.6	-1.8	3.2	1.1
Rural medium farmers	11325	3.7	7.0	18.7	2.3	2.4	1.0	-0.6	0.0	1.3	2.1	7.6	1.0	0.0	-0.6	2.6	0.7
Rural large farmers	13094	3.4	6.5	16.9	2.1	2.8	1.1	-1.3	-0.1	1.8	2.4	7.3	0.8	0.0	-0.9	1.8	0.6
Rural non agric. activities	19251	3.6	7.0	19.8	2.7	-0.4	-3.0	-1.1	0.8	-3.1	-4.6	1.6	1.3	-2.6	-3.1	2.5	1.2
Urban low education	70912	3.7	7.3	21.1	2.9	-1.6	-3.5	0.1	1.2	-4.7	-5.9	1.1	1.6	-3.2	-3.1	3.5	1.5
Urban medium education	55501	4.0	7.9	23.4	3.2	-2.9	-3.9	0.0	1.1	-7.2	-7.8	-1.0	1.7	-3.8	-3.2	3.3	1.5
Urban high education	37893	4.6	9.1	27.0	3.6	-3.7	-3.7	0.2	1.0	-10.1	-10.0	-4.0	1.7	-3.7	-2.7	3.3	1.6
Utility																	
Rural small farmers	35483	3.7	7.2	20.3	2.7	0.3	-1.1	0.2	0.6	-2.6	-2.5	3.8	1.3	-1.5	-1.5	3.5	1.1
Rural medium farmers	11665	3.6	6.9	18.4	2.3	2.3	1.1	-0.3	0.0	0.8	1.6	7.0	1.0	0.0	-0.5	2.8	0.7
Rural large farmers	13486	3.3	6.4	16.6	2.1	2.8	1.1	-1.0	-0.1	1.3	1.9	6.8	0.9	0.0	-0.8	2.0	0.6
Rural non agric. activities	21294	3.4	6.6	18.8	2.6	-0.2	-2.4	-0.1	0.9	-4.4	-5.6	0.5	1.3	-2.3	-2.5	3.1	1.3
Urban low education	77705	3.5	6.9	20.1	2.8	-1.3	-2.9	0.9	1.2	-5.7	-6.7	0.1	1.6	-2.8	-2.5	4.0	1.5
Urban medium education	60557	3.8	7.5	22.2	3.1	-2.5	-3.3	0.8	1.2	-8.0	-8.4	-1.8	1.6	-3.4	-2.7	3.8	1.5
Urban high education	38778	4.5	8.9	26.5	3.6	-3.6	-3.6	0.4	1.1	-10.2	-10.2	-4.1	1.7	-3.6	-2.5	3.5	1.6

* : growth rate

Results (except *) are in percent deviation from year 1

5.2. Simulation Results

The results obtained for the impact of the shock without policy adjustment and with implementation of fiscal and monetary policies are given in Table 6.

i. No adjustment

Resisting the introduction of fiscal and monetary policies in spite of the foreign sector shock has two consequences that are commonly found with real CGE analysis (see Figure 1): The loss of foreign exchange leads to a sharp devaluation of the exchange rate (75 percent in year 2) and to a fall in absorption, both of which are contractionary in GDP. The three additional phenomena that are captured in the financial CGE are the following:

1. The rising price of tradables, induced by exchange rate devaluation, creates inflation. Because wages are only partially indexed in a period of rising inflation, the level of real wages falls by 6.7 percent in year 2. This allows the quantity supplied in some of the more tradable sectors to increase and employment to increase temporarily. Overall, the short-run recession is, consequently, only minimal (-0.1 percent change in GDP relative to pre-shock[1]). In period 3, however, the rate of inflation starts to decline and real wages overshoot. This occurs when the crisis induced by the foreign sector shock comes about full force. Employment falls by 4.6 percent and GDP by 1.9 percent. The partial wage adjustment mechanism, therefore, delays the recession, and the full negative effect of the crisis takes two years to materialize.

2. Falling foreign borrowing without reduction in expenditures increases the government deficit by 76.6 percent. By borrowing on the domestic market, interest rates rise sharply and private investment is crowded out as it falls by 46.8 percent in year 3. (This is the same ultimate effect as in a real CGE except that it occurs here through interest rate movements on the loanable funds market instead of competition for a fixed quota of domestic savings.) It is this rise in interest rates that eventually will lead to implementation of fiscal policies.

3. Finally, inflation has a direct detrimental effect on investment. Indirectly, inflation could also have a negative effect on investment through increasing capital outflight and decreasing investable funds. In this case, this does not happen as the sharp rise in interest rates counteracts capital outflight.

Lack of adjustment to the crisis thus has a low cost on economic growth in the very short run because of the lag in wage adjustment. In the medium run, however, it leads to a sharp increase in interest rates and inflation, resulting with a fall in economic growth. It is to counteract these negative effects on interest rates and inflation that fiscal and monetary policies are eventually introduced.

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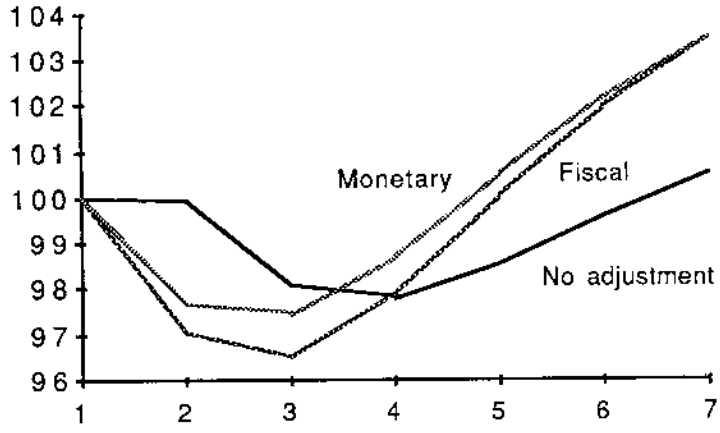
[1] Unless otherwise mentioned, all effects are measured as percentage changes relative to pre-shock levels.

Figure 1 - Base Parameter Values



In terms of welfare effects, we see (Table 6) that real exchange rate devaluation leads to terms of trade effects that benefit agricultural households while it hurts the urban. In the short run, the main gainers are the large farmers. Over time, the small restoration of growth and the decline in the inflation rate lead to a fall in the real exchange rate, eroding the large farmers' real income gains which become negative. In the short run, the main losers are the urban rich. This is due to the fact that real wages fall in year 2 and then employment falls in year 3 when wages recuperate, leading in all years to a decline in the wage bill. The urban poor, importantly sheltered by the informal sector, suffer a lower decrease in real income. In the long run, however, class income levels tend to converge back to their initial levels, and the relative losses in per capita income are due only to differential population growth rates in the urban and rural areas.

ii. Fiscal adjustment

With a reduction in government expenditures, government deficit and borrowing decline, putting less pressure on the interest rate that falls sharply relative to no-adjustment. This allows private investment to increase relative to no-adjustment and long-term growth is higher. This reduction in crowding out of private investment is the same as that captured in a real CGE, except that it occurs here explicitly through the loanable funds market. This long-term positive effect of fiscal policies will be all the more important if the productivity effect of private investment is large compared to that of public investment, an effect that we will detail later.

This long-term positive effect of fiscal policy is compromised by two negative short-term effects. The first is that fiscal austerity leads to a change in the composition of aggregate demand. Government expenditures were largely directed at labor intensive nontradables (public services and construction) while private investment has a high share of more capital intensive commodities and a high share of imported capital goods. The result is that it creates lower Keynesian multiplier effects and reduces economic growth in the short run.

A second negative effect occurs specifically via monetary phenomena: Falling interest rates lower household savings and induce them to hold on to higher levels of currency. This form of hoarding creates a leakage that reduces demand and lowers economic growth. Displacement of one dollar of public expenditures is thus replaced by less than one dollar of private expenditures, deepening the short-run Keynesian effect and the magnitude of the recession.

Socially, all households lose from the short-run recession induced by fiscal instruments compared to no-adjustment. By far, the main losers are the urban medium and rich classes since fiscal austerity makes them lose public sector employment. Urban poor and rural nonagricultural households, on the other hand, lose more from reduction in access to benefits included in the valuation of their utility. Politically, the short-run cost of fiscal adjustment is, consequently, likely to be highly resisted. In the long run, however, the policy favors economic growth and lower poverty, particularly in the rural sector.

iii. Monetary adjustment

A monetary approach to stabilization induces a lower short-run recession but a lower level of long-run economic growth. In the run with base parameter values (Figure 1), the policies have been scaled to reach the same long-run levels of GDP. In the short run, reduction in the money supply raises interest rates and lowers sharply private investment, which falls by 40 percent as in the case of no-adjustment. The fall in GDP is, however, less than with a fiscal adjustment since the level of government expenditures continues to increase, thus avoiding the negative short-run Keynesian effect of fiscal policies. Also, in the short run, falling private investment has a low opportunity cost on productivity growth. Control of inflation has, however, long-term beneficial effects on investment.

Reduced inflation has a direct effect on investment since it increases the clarity of price signals and reduces risk. In addition, reduced inflation helps contain capital outflight to about 40 percent of the pre-crisis level while a fiscal approach has no impact on capital outflight. Reduced capital outflight increases the availability of loanable funds and puts downward pressure on interest rates, favoring investment.

Socially, a monetary adjustment is more neutral on the distribution of income than a fiscal policy. Lower real exchange rate devaluation benefits less the large farmers and hurts less the urban consumers. Falling inflation also raises real wages which benefits both the rural poor and the urban classes. Finally, employment in public works projects and in government services is preserved, and this is of greatest benefit to the urban medium and high households.

In conclusion, the short-run cost of the crisis on economic growth is less with no-adjustment than with monetary policies and less with monetary than with fiscal adjustment. Failing to adjust, while tempting in the short run, has a high opportunity cost in the long run. A fiscal approach has a highly negative short-run effect compared to a monetary approach. In the long run, however, the fiscal adjustment is superior in terms of economic growth. The trade-off between short- and long-run gains thus requires assessment of these different adjustment strategies in terms of alternative discount rates as well as in terms of welfare.

VII. Sensitivity Analysis

With little empirical validation for the parameters used in the model, it is important to see how the solutions obtained respond to different specifications of a number of the model's key parameters. We do this by assessing how the optimum policy for growth, measured under a set of alternative discount rates, is affected by a high or low impact of inflation on investment, a high or low impact of inflation on capital outflight, a rigid or flexible financial sector, and whether the formation of expectations on inflation responds to past inflation and, hence, to the ability of government to affect inflation. We give, in Table 7, the optimum policy for growth under these alternative parameter values.

Table 7 - Sensitivity Analysis
Ranking of policies for economic growth

Structural features	Year 2	Discount Rates 30%	5%	Last Year
Base parameters values	N > M > F	M > N > F	M > F > N	+M = +F > +N
Impact of inflation on investment				
Lower	N > M > F	N > F > M	+F > +N > M	+F > +M > +N
Higher	N > M > F	M > N > F	M > F > N	+M > +F > N
Impact of inflation on capital flight				
Lower	N > M > F	N > M > F	M > F > N	+F > +M > +N
Higher	N > M > F	M > N > F	M > F > N	+M > +F > +N
Rigidity of the financial sector				
More rigid	N > M > F	F > N > M	F > M > N	+F > M > N
More flexible	N > M > F	M > N > F	+M > N > F	+M > +F > +N
Constant expectations of inflation	N > M > F	N > F > M	F > N > M	+F > +N > M

N = No adjustment
M = Monetary adjustment
F = Fiscal adjustment
\+ = Positive GDP growth over base year

i. Impact of inflation on investment (Figure 2)

With the model's base parameter values, fiscal policy is worse in the short run, but it catches up with monetary policy in the last period, with a consequently higher long-run growth rate. The higher the elasticity of expected inflation on investment, the higher is the cost of letting inflation run away under either no-adjustment or fiscal policies. The result is that the positive effect of a fiscal adjustment on investment is contradicted by high inflation. Except for the very short run, where the no-adjustment option dominates, a monetary approach is thus most desirable when the impact of inflation on investment is high, while a fiscal policy is the most desirable when it is low.

ii. Impact of inflation on capital outflight (Figure 3)

Inflation increases capital outflight which diminishes the availability of funds for domestic investment. This raises the interest rate and lowers investment. As a result, the higher the effect of inflation on capital outflight, the more costly the neglect of inflation becomes. In this case, monetary policies dominate fiscal policies, even at low discount rates. If inflation has little effect on interest rates via capital outflight, then, to the contrary, the control of inflation is not as important and fiscal policies dominate in the long run. Even under this situation, the short-run cost of a fiscal over monetary adjustment leads to preference for a monetary approach when discount rates are high.

iii. Role of flexibility in the financial system (Figure 4)

Greater flexibility in the financial system implies a higher response of savings to interest rates and a greater substitutability in the allocation of assets between domestic and foreign bonds. This has a direct effect on the effectiveness of monetary as opposed to fiscal policies in restoring economic growth. The monetary approach to stabilization, in reducing the money supply, raises interest rates. The positive side of the rise in interest rates is that it reduces capital outflight and increases the flow of savings; the negative is that it deters investment.

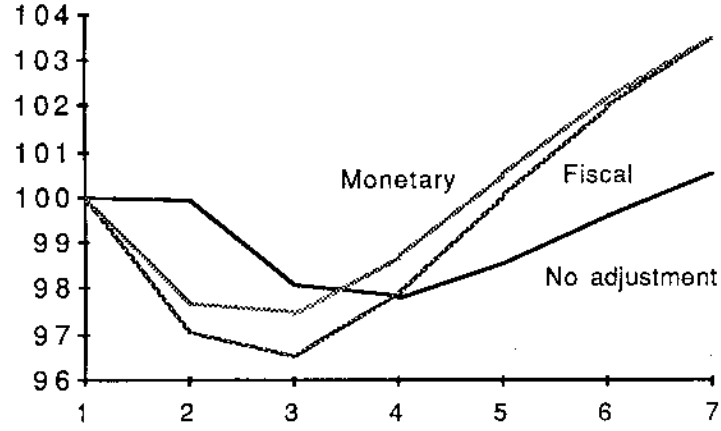
If the financial sector works well, the interest rate will not rise as much, investment is preserved, and long-run growth is safeguarded. In this case a monetary approach is best for growth and even a no-adjustment approach is better than fiscal interventions. The converse holds under a shallow financial sector, and the fiscal approach to stabilization is best. This is because, if the financial sector is not responsive to interest rates, resources need to be freed directly from use by government to lower interest rates. Thus, countries with well-developed financial institutions will not have to turn as intensely toward government resources in order to shelter private investment from the liquidity crisis.

iv. Constant expectations of inflation

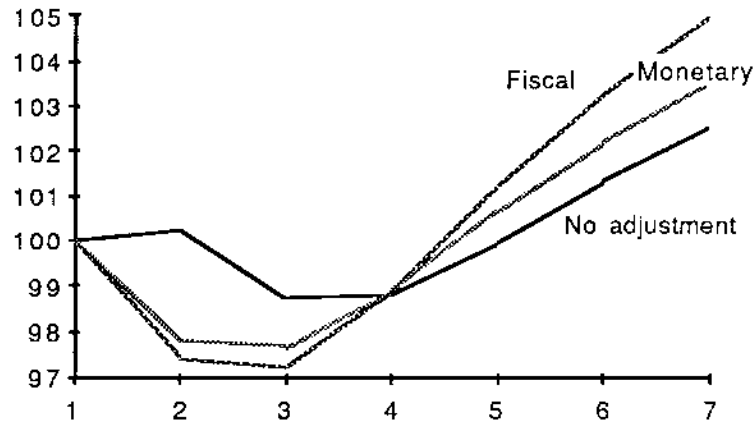
The formation of expectations on future inflation is key in portfolio allocation and investment decisions. If adjustment is not credible in breaking expectations of future inflation, monetary policy will be ineffective: capital outflight remains high, the

Figure 2 - Effect of inflation on investment

2.a: Base run



2.b: Lower effect of inflation on investment



2.c: Higher effect of inflation on investment

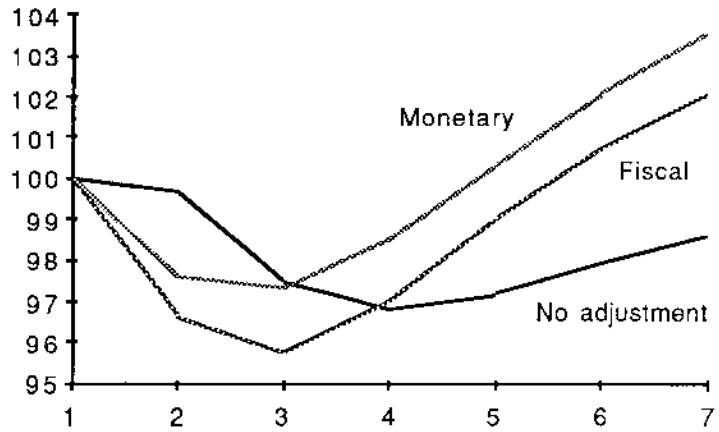
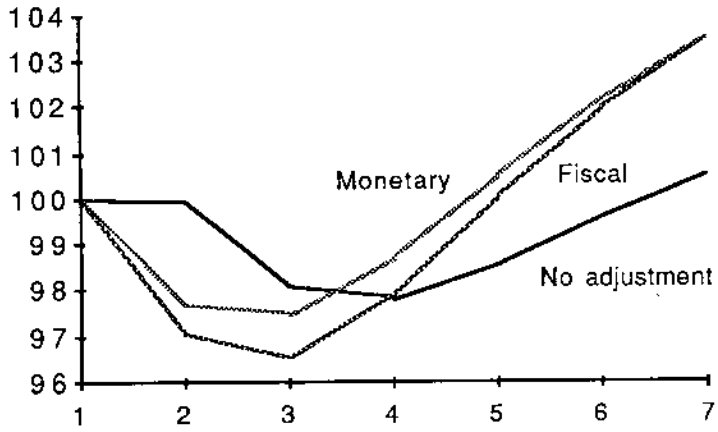
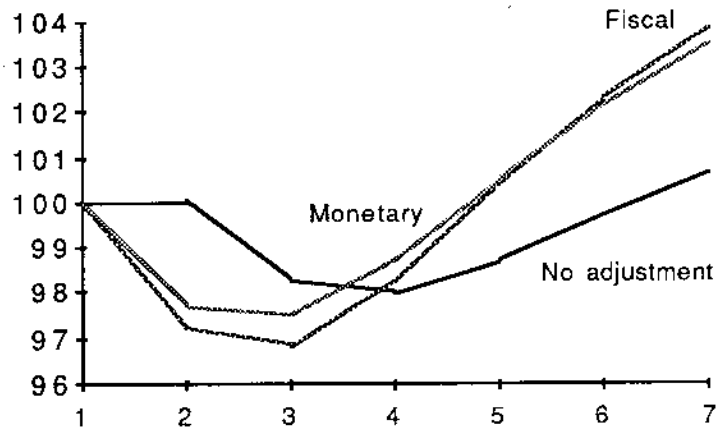


Figure 3 - Effect of inflation on capital flight

3.a: Base run



3.b: Lower effect of inflation on capital fight



3.c: Higher effect of inflation on capital flight

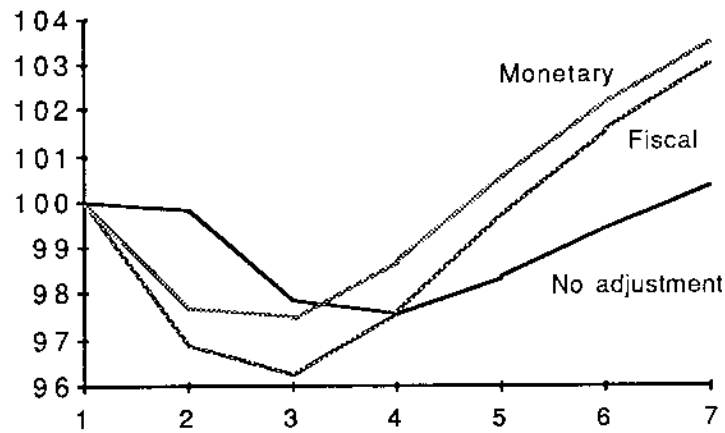
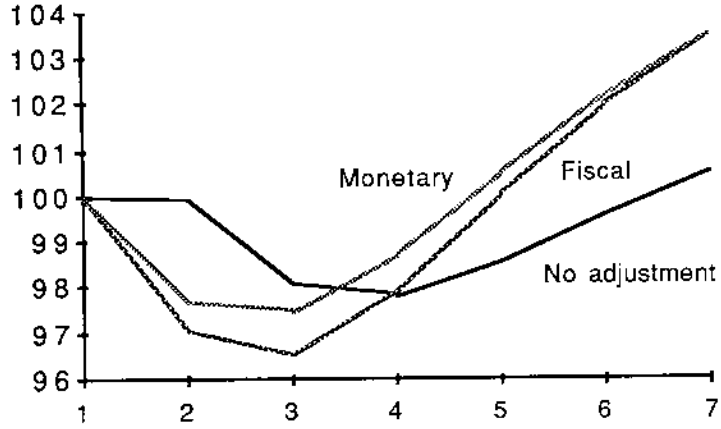
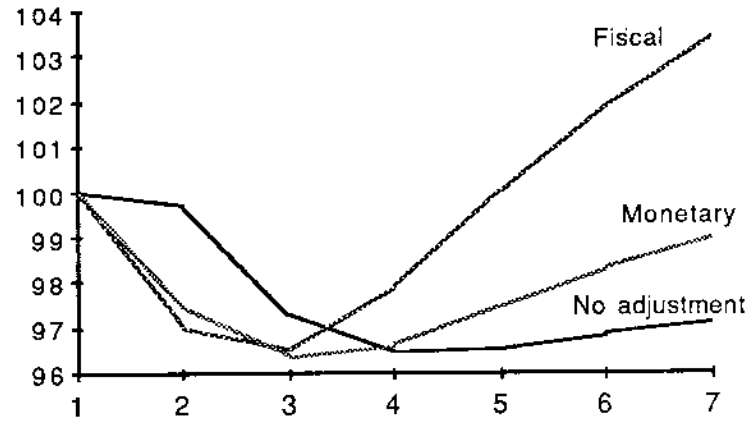


Figure 4 - Functioning of financial system

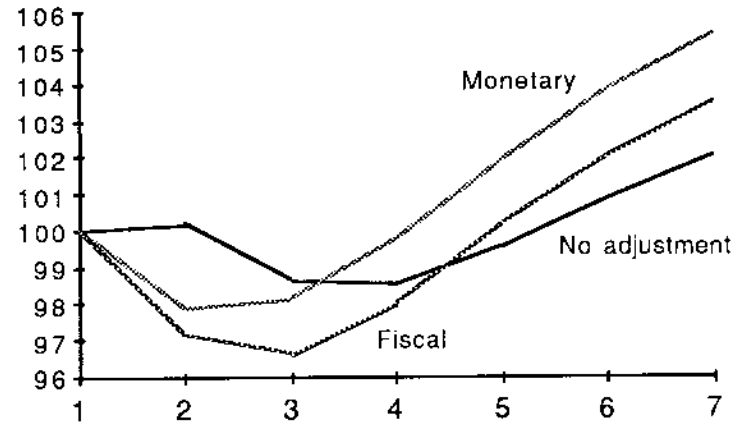
4.a: Base run



4.b: Financial system more rigid



4.c: Financial system more flexible



rate of interest skyrockets, and investment is low. Implementation of a monetary policy provokes a recession without the benefits of reducing the rate of inflation. The result is that investment is lower than under no-adjustment and the economy does not recover from the crisis. In this case, with the formation of expectations out of control, a fiscal alternative is clearly superior. Making the control of inflation a credible component of stabilization policies is thus a key condition for success of a monetary approach. To a large extent, this is conditional upon the degree of legitimacy that a government has been able to acquire in past experiences of crisis management and to its ability to communicate to the public the logic of its stabilization package.

VIII. Conclusion

In this paper, we have built a Computable General Equilibrium model with a financial sector in order to analyze stabilization programs implemented in response to external debt crisis. This has been carried through using the early 1980 Ecuadorian economy as an example.

The main results are the following: (1) Lack of adjustment beyond the maintenance of a flexible exchange rate is very tempting. It has very little short-term cost but has a long-term negative impact on growth. (2) All adjustments that include devaluation favor rural households over the urban households and large farmers over small farmers. (3) Fiscal adjustment is necessary to protect private investment and long-term growth but has very high short-run recessionist impact and hits particularly hard the urban population. (4) The control of inflation by monetary policies is a necessary complement to fiscal policies in order to reduce capital flight and encourage investment. (5) Sensitivity analysis shows that the monetary policy is less efficient the less responsive is the financial market and the less credible is the ability of the government to control inflation. In both cases, fiscal adjustment tend to be a superior alternative. (6) On the other hand, monetary policies are more important the more responsive are capital flight and investment to inflation.

The optimal choice or mix of fiscal and monetary policies, therefore, depends on structural features of the economy and on the discount rate used to weigh the future years.

APPENDIX

Table 4bis. Social Accounting Matrix, Ecuador 1980.

(millions of Sucres)

	Ag. Exports 1	Other Ag. 2	Oil 3	Ind. Consom. 4	Product. Goods 5	Util.Cnstr Trnsp. 6	Trade 7	Services 8	Govt Services 9	*Total Commod.*	Skilled 10	Unskilled 11	Ag. Labor 12	*Total Labor*	Corpor. Capital 13	Trade Margins 14	Urban Low Ed. 15	Urban Med. Ed. 16	Urban High Ed. 17	Rural NonAg 18	Small Farms 19	Medium Farms 20	Large Farms 21	*Total Hholds*
Current Accounts																								
1 AgExports	18		26	8174	2292	80		148	46	10784							812	433	203	159	307	110	119	2143
2 Other Ag.		758		18247	139			1278	416	20838							4570	2404	1153	1007	3736	1153	1075	15096
3 Oil	177	52	176	307	1322	3410	33	116	322	5915							529	295	165	123	195	51	49	1406
4 Ind. Consom.	128	1336	48	15206	636	55	31	3051	933	21424							20413	12282	6323	4895	11584	3639	3253	62390
5 Product. Goods	1392	1846	2825	4552	23022	21245	4761	4099	9519	73261							8957	6943	4490	3074	4780	1487	1678	31408
6 Util.Cnstr.Trnsp	152	245	1725	1355	1443	2943	9978	2147	3315	23303							5358	4190	3019	1708	2405	591	925	18196
7 Trade	-4	131	-182	-314	11	458		-100	918	918						58182	493	331	194	129	279	83	84	1592
8 Services	363	109	808	1096	642	6620	6626	13333	1021	30618							12608	10361	6812	3641	5668	1472	1563	42126
9 Govt Services																	141	129	101	37	62	19	30	518
Total commodities	2226	4477	5426	48623	29507	34811	21429	24072	16490	187061						58182	53880	37366	22460	14774	29015	8605	8775	174875
10 Skilled	95	259	1295	1934	2067	6448	3720	14880	21343	52041														
11 Unskilled	124	197	443	7429	5829	23711	13059	19814	5149	75754														
12 Ag. Labor	2559	12670	6	214	146	27	231	68	98	16019														
Total labor	2778	13126	1744	9577	8042	30185	17010	34762	26590	143814														
13 Corporate capita	453	1316	29261	7086	5384	4382	5298	-877		52303														
14 Trade Margins	5545	7612	1682	12624	30719					58182														
15 Urb. Low Educ.	1478	423		7204	1070	5585	5315	3175		24250	6275	31578	968	38821			1041	1151	918	6	12	4	9	3141
16 Urb. Med. Educ.	148	269		2493	1074	2224	2959	3085		12252	16537	18188	291	35017			988	1099	920	5	8	3	5	3026
17 Urb. High Educ.	214	101		157	164	658	460	3164		4918	24511	1802	130	26442			774	921	736	1	1		1	2435
18 Rural NonAg.	1718	40		1405	278	1319	2232	1229		8221	1870	7641	612	10122						148	246	79	156	630
19 Small Farms	1675	1494		1980	437	1287	1863	872		9608	1294	13522	7652	22468						333	554	182	349	1418
20 Medium Farms	1337	2508		363	72	289	566	335		5470	297	1848	3417	5562						60	102	32	63	258
21 Large Farms	2166	3884		241	56	554	808	404		8113	519	1175	2950	4644						39	64	21	40	164
Total households	8736	8719		13843	3151	11916	14203	12264		72832	51303	75754	16019	143076			2801	3171	2575	594	987	321	623	11071
22 AgExports															453									
23 Other Ag.															1316		1	1	2	0	0	0	0	4
24 Ind. Consom.															7086		19	17	10	0	1	0	0	47
25 Product. Goods															5384		90	162	105	2	2	1	0	362
26 Util Cnstr.Trnsp															4382		128	176	110	12	6	1	3	436
27 Trade															5298		98	133	99	3	2	1	0	335
28 Services															2207		8	22	126	0	0	0	0	157
Total non oil firms															26126		344	511	452	17	11	4	4	1342
29 Private Oil															8845									
30 Public Oil															20416									
Total firms															55387		344	511	452	17	11	4	4	1342
31 Financ. Instit.															-3084		1217	1277	1367	406	549	323	494	5632
32 Income tax																	2389	4041	4213	444	372	42	29	11530
33 Indirect Tax	263	179	4681	3215	1501	845	242	1438		12364														
34 Import Tariff	3	-606	88	1477	11062					12024														
35 Government																								
36 Rest of World	10	2485	5805	3794	51418	3128	6205	1682		74527	738			738					38					38
Capital Accounts																								
37 Urb. Low Educ.																	10280							10280
38 Urb. Med. Educ.																		9133						9133
39 Urb. High Educ.																			6789					6789
40 Rural NonAg.																				3020				3020
41 Small Farms																					3033			3033
42 Medium Farms																						2030		2030
43 Large Farms																							3169	3169
Total households																	10280	9133	6789	3020	3033	2030	3169	37453
Total	20014	37308	48687	100239	140784	85267	64387	73341	43080	613107	52041	75754	16019	143814	52303	58182	70911	55499	37893	19253	33968	11326	13093	241941

Table 4bis. Social Accounting Matrix, Ecuador 1980 (cont.)

(millions of Sucres)

	Ag. Exports 22	Other Ag. 23	Ind. Consom. 24	Product. Goods 25	Util.Cnstr Trnsp 26	Trade 27	Services 28	*Total Non Oil*	Private Oil 29	Public Oil 30	*Total Firms*	Financ Instit. 31	Income Tax 32	Indir Tax 33	Import Tariff 34	Govermt 35	Rest of World 36	Urban Low Ed. 37	Urban Med. Ed. 38	Urban High Ed. 39	Rural NonAg. 40	Small Farms 41	Medium Farms 42	Large Farms 43	*Total Hholds*
Current Accounts																								
1 AgExports																	6737							
2 Other Ag.																	329							
3 Oil																	40333							
4 Ind. Consom																	15131							
5 Product. Goods																	1859							
6 Util.Cnstr.Trnsp																	5116							
7 Trade																	3695							
8 Services																	597							
9 Govt Services																42562								
Total commodities																42562	73797							
15 Urb. Low Educ.	11	10	417	69	119	231	9	866	37	3	906	1095				2666	33							
16 Urb. Med. Educ.	15	14	360	208	123	272	20	1011	36	2	1049	1213				2920	22							
17 Urb. High Educ.	40	35	108	220	116	274	141	935	33	1	969	1243				1675	10							
18 Rural NonAg.	0	0	30	5	28	29	1	94			94	61				125								
19 Small Farms	2	2	4	2	4	5	0	18			18	18				437								
20 Medium Farms	3	3	1	0	0	1	0	9			9	9				18								
21 Large Farms	12	16	3	0	12	6	0	49			49	65				58								
Total households	82	81	924	504	403	818	171	2983	106	6	3095	3703				8099	65							
22 AgExports																								
23 Other Ag.	0	0	0	0	0	0	0	1			1	4												
24 Ind. Consom.	0	0	2	2	3	3	1	11			11	43												
25 Product. Goods	1	1	16	18	23	21	6	87	0		87	335												
26 Util.Cnstr.Trnsp	2	2	20	23	29	26	8	108	5		113	769												
27 Trade	1	1	15	17	21	19	6	81	0		81	322												
28 Services	1	1	7	8	10	9	3	38	0		38	156												
Total non oil firms	5	5	61	68	86	77	23	326	5		331	1629												
29 Private Oil												240												
30 Public Oil																								
Total firms	5	5	61	68	86	77	23	326	5		331	1869												
31 Financ. Instit.	109	564	2055	2200	647	1350	926	7851	20	40	7911					26	2088							
32 Income tax	50	49	752	436	175	797	159	2418			2418	2911												
33 Government	55	103	176	70	1044	168	34	1650	8264	17235	27149		16859	12364	12024		931							
36 Rest of World	70	288	2082	1626	1322	1247	759	7394	499		7893	82				8026								
Capital Accounts																								
44 AgExports	82							82			82													
45 Other Ag		236						236			236													
46 Ind. Consom.			1139					1139			1139													
47 Product. Goods				1262				1262			1262													
48 Util.Cnstr.Trnsp					2022			2022			2022													
49 Trade						1579		1579			1579													
50 Services							486	486			486													
Total non oil firms	82	236	1139	1262	2022	1579	486	6806			6806													
51 Private Oil									191		191													
52 Public Oil										3135	3135													
Total firms	82	236	1139	1262	2022	1579	486	6806	191	3135	10132					10614		1157	1011	695	225	432	68	36	3626
53 Government																								
54 Central Bank																								
55 Comm. Banks												4008												
57 Stocks																								
58 Housing																		3808	2103	632	486	502	525	674	8730
59 Household capita																		1652	760	169	1447	1249	1084	1346	7707
62 Govt capital																								
63 Shares																		848	1161	1019	211	20	18	146	3423
64 Money																		1211	988	482	345	810	263	242	4342
67 Dom. borrowing																								
68 Time deposits																		1209	1572	1529	155	20	21	219	4725
69 Foreign borrowir																								
70 Foreign currency																		395	1538	2262	150		50	505	4900
Total	453	1326	7188	6168	5700	6036	2558	29428	9085	20416	58929	12573	16859	12364	12024	69327	91304	10280	9133	6789	3020	3033	2030	3169	37453

Table 4bis. Social Accounting Matrix, Ecuador 1980 (end)

(millions of Sucres)

	Ag Exports 44	Other Ag. 45	Ind. Consom. 46	Product. Goods 47	Util.Cnstr Trnsp. 48	Trade 49	Services 50	*Total Non Oil*	Private Oil 51	Public Oil 52	*Total Firms*	Central Governt 53	Central Bank 54	Commer. Banks 55	Rest of World 56	Stocks 57	Housing 58	Hhold Capital 59	Firms Capital 60	Banks Capital 61	Govt Capital 62	*Total*
Current Accounts																						
1 AgExports																350						20014
2 Other Ag.																391	113		520	21		37308
3 Oil																1033						48687
4 Ind. Consom.																1294						100239
5 Product. Goods																2517	4965		22924	935	2915	140784
6 Util.Cnstr.Trnsp																1719	3652		16862	688	15731	85267
7 Trade																						64387
8 Services																						73341
9 Govt Services																						43080
Total commodities																7304	8730		40306	1644	18646	613107
Capital Accounts																						
37 Urb. Low Educ.																						10280
38 Urb. Med. Educ.																						9133
39 Urb. High Educ																						6789
40 Rural NonAg.																						3020
41 Small Farms																						3033
42 Medium Farms																						2030
43 Large Farms																						3169
Total households																						37453
44 AgExports												-13		5								75
45 Other Ag.												108		14								359
46 Ind. Consom.												120		41								1299
47 Product. Goods												134		45								1441
48 Util.Cnstr.Trnsp												4129		131								6282
49 Trade												289		57								1925
50 Services												142		16								646
Total non oil firms												4909		311								12025
51 Private Oil																						191
52 Public Oil												-719										2416
Total firms												4190		311								14633
53 Government																						14240
54 Central Bank																						4008
55 Comm. Banks																						14423
56 Rest of World																						7304
57 Stocks	70	199	1004	1070	757	1769	218	5086	51	140	5277	712		1315								8730
58 Housing																						40306
59 Household capita	-528	-1594	-826	-307	-1422	-1934	-1096	-7707			-7707											1644
60 Firms capital	1129	4781	6276	6828	10458	3916	4455	37844	221	2241	40306											18646
61 Banks capital														1644								
62 Govt capital												18646										
63 Shares	-50	-378	-646	-846	-1276	-228	-331	-3755	-75		-3830	2564		-3540	1383							
64 Money	52	205	469	411	1334	1702	1174	5346	69	35	5450		-3254	-6538								
65 Reserve													-1409	1409								
66 DCGovt												1320	-1320									1
67 Dom. borrowing	-554	-2453	-4050	-4432	-1900	-2482	-2964	-18836	-75		-18911	3858	922	14132								
68 Time deposits														-4725								-1
69 Foreign borrowir	-44	-401	-927	-1282	-1669	-818	-810	-5952			-5952	-17050			23001							
70 Foreign currency													5061		-9961							
Total	75	359	1298	1441	6282	1925	645	12025	191	2416	14632	14240		4008	14423	7304	8730		40306	1644	18646	

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